

**Missouri Specialty Crop Marketing and Enterprise Budgets:  
A Commercial Grower's Guide**

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This report is the third of a three-part series on the economic viability of expanding fresh and processed fruit and vegetable production in Missouri. The other related parts include:

Part 1: The Economic Viability of Expanding Fresh and Processed Fruit and Vegetable Production in Missouri – Interview Summaries, Marketing, Outlook, Opportunities, and Next Steps

Part 2: The Economic Viability of Expanding Fresh and Processed Fruit and Vegetable Production in Missouri – Fruit and Vegetable Processing

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## **Missouri Specialty Crop Marketing and Enterprise Budgets: A Commercial Grower's Guide**

The report is directed at growers who are either currently commercial fruit and vegetable growers or may be considering becoming a commercial grower. In preparing this guide we interviewed over 50 Missouri fruit and vegetable growers and have incorporated their advice in this guide. This guide focuses on the two most important financial aspects of producing fruits and vegetables:

1. developing your marketing plan, and
2. providing enterprise budgets for various Missouri fruit and vegetable crops.

If you look across the various fruit and vegetable marketing guides from state extension services one of the most resounding themes is having a detailed marketing plan before you even plant the crop (Rowell, Woods, & Mansfield) (Trinklein, Hendrickson, & Jett, Marketing Vegetables in Missouri, 2015).

Specialty crop markets are very different than row crop markets because specialty crops are often highly perishable and do not have guaranteed markets in place. As a grower, you must

- identify which markets you want to participate in,
- meet with buyers/managers of those markets in order to determine type of specialty crops they will buy, the specific varieties they want, their delivery specifications (delivery times, packaging, etc.), food safety regulations you must meet, whether your produce will be a priority with the buyer or compete with other growers/supplies, complete any required paperwork regarding food safety, and/ possibly set a buying contract,
- determine what volume you anticipate selling in each market,
- how you will cool and/or preserve the quality of your product, and
- how you will transport your products to market.

Many growers dislike the marketing aspect of fruit and vegetable production preferring to focus on the production aspects. However, experienced growers note that you need to establish a relationship with your buyers and understand what they want before you plant the first seed or transplant. They also strongly caution that you have more than one buyer. In order to help you in developing your marketing plan, the sections below provide a detailed examination of the various levels of the fruit and vegetable markets.

The second part of this report focuses on fruit and vegetable enterprise budgets for Missouri. We've included the budgets for the various specialty crops in this report because we learned from the grower interviews that not everyone has internet service easily available. We explain the different approaches to

annual and perennial crop budgets using one specialty crop of each type. However, we have not explained every budget since the budgets follow similar formats.

### **Fruit and vegetable marketing in Missouri**

Some of the most important and critical activities in getting into commercial fruit and vegetable production are determining what markets are best for you to sell to, identifying what types of produce is wanted in that market, and learning when and in what format the market wants the produce delivered. These activities apply regardless of the market that you intend to sell in. For example, a beginning grower may want to sell in the local Farmers' Market, but before buying the first seed, that grower should contact the Farmers' Market manager and determine availability for a stall at the market and what they can sell at the market. The market manager may also provide insights into the types and varieties of produce that is selling well. They may also be able to guide the producer on how the produce needs to be packaged, the quantity of product to bring, as well as provide pricing guidelines. With this information, the grower is equipped to determine the type and variety of specialty crops they will produce and have an idea of how much they want to produce.

Each potential fruit and vegetable market will have specific produce needs, regulations, labeling, packaging, grading, etc., information growers need to know before they start producing (Trinklein, Hendrickson, & Jett, Marketing Vegetables in Missouri, 2015) (Rowell, Woods, & Mansfield). Growers many need to adjust which markets they intend to sell in based on the market requirements. Figure 1 shows how some of the market characteristics vary by sales volume potential. Low volume markets tend to have fewer rules, less insurance, lower capital requirements, less shelf life needed, and typically pay retail prices. However, they also usually require that the grower interact directly with the end consumer which takes more marketing time and the grower is unlikely to sell everything they produce. At the other extreme, high volume markets tend to have more regulations, food safety inspection requirements, more insurance, high capital demands, want longer shelf life, require full traceability, and typically pay only wholesale prices. The figure also includes black, red, and gray dividing lines between the sales volume levels. Most Missouri growers fall below the red line producing low or moderate production levels.

Figure 2 illustrates the marketing steps in expanding fruit and vegetable production. The grower may not choose to market to all steps but the diagram attempts to convey potential markets for each volume level. Level 1 markets have the lowest volume levels and are typically the simplest to operate in while level 4 markets tend to be able to handle the largest volumes but are also the most complex to manage. The green arrow shows the types of things that increase as one moves from level 1 production to level 4 production. The purple arrow pointing down shows that prices received and produce flavor tend to fall as production volumes increase.

Figure 1. Fruit and vegetable market characteristics by sales volume

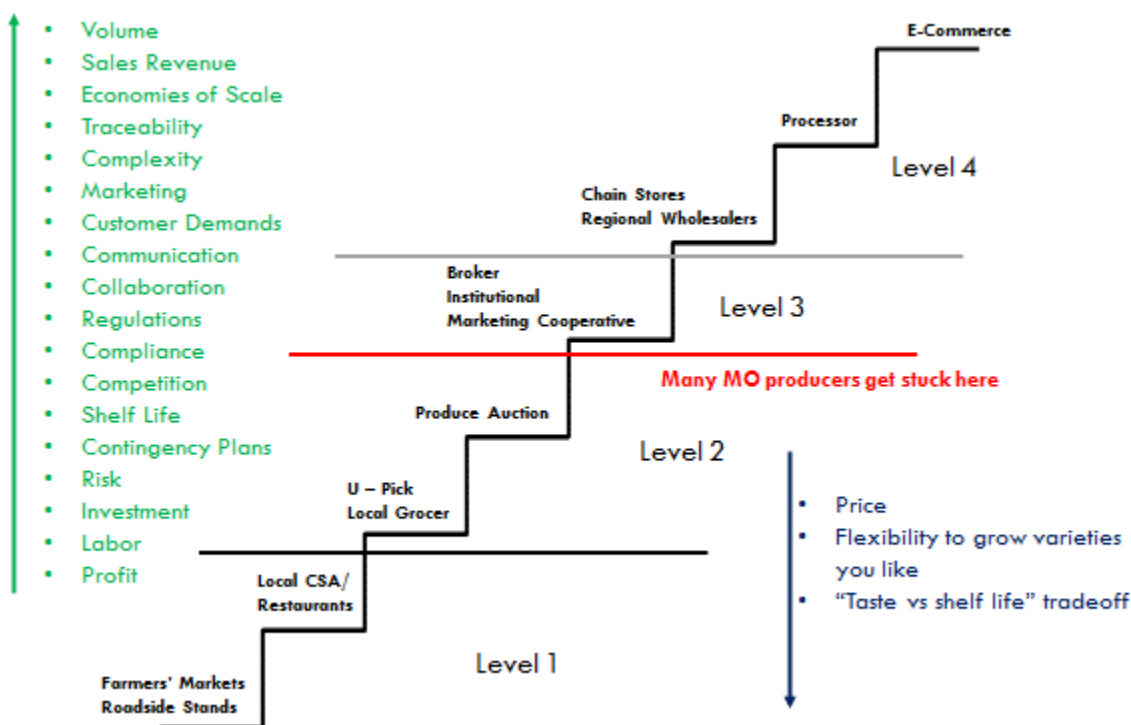
| Market Characteristic                               | Sales Volume Potential |                |           |             |          |              |                 |        |               |                       |            |                          |
|-----------------------------------------------------|------------------------|----------------|-----------|-------------|----------|--------------|-----------------|--------|---------------|-----------------------|------------|--------------------------|
|                                                     | low                    |                |           |             | moderate |              |                 | high   |               |                       | very high  |                          |
|                                                     | Farmers Markets        | Roadside Stand | Local CSA | Restaurants | U-Pick   | Local Grocer | Produce Auction | Broker | Institutional | Marketing Cooperative | Processing | Chain Store Distribution |
|                                                     |                        |                |           |             |          |              |                 |        |               |                       |            |                          |
| Difficulty getting into the market                  | L                      | L              | M         | L           | L        | M            | L               | H      | M             | M                     | H          | H                        |
| Direct consumer contact & service                   | H                      | H              | H         | L           | H        | L            | L               | L      | L             | L                     | L          | L                        |
| Compatibility with off farm employment              | H                      | H              | M         | H           | H        | M            | H               | L      | L             | M                     | H          | L                        |
| Marketing time                                      | H                      | H              | H         | M           | H        | M            | L               | L      | L             | L                     | L          | M                        |
| Electronic, computer, internet complexity required  | N                      | N              | M         | L           | M        | M            | L               | M      | M             | M                     | L          | M                        |
| Transport/Shipping cost                             | L                      | L              | H         | M           | N        | M            | L               | M      | M             | M                     | M          | M                        |
| Initial capital required                            | L                      | L              | L         | L           | L        | H            | L               | H      | H             | H                     | V          | H                        |
| Investment in post harvest equipment and facilities | L                      | L              | L         | M           | L        | M            | L               | H      | H             | H                     | V          | H                        |
| Likelihood of production contract                   | N                      | N              | N         | M           | N        | M            | N               | H      | H             | M                     | H          | H                        |
| Likelihood of product tracability                   | N                      | N              | L         | M           | N        | H            | L               | H      | H             | H                     | H          | H                        |
| Likelihood of requiring GAP certification           | N                      | N              | L         | M           | N        | H            | M               | H      | H             | H                     | H          | H                        |
| Likelihood of requiring liability insurance         | L                      | L              | L         | L           | H        | M            | L               | H      | H             | H                     | H          | H                        |
| Ability to set prices                               | H                      | H              | H         | H           | H        | M            | L               | L      | L             | L                     | L          | L                        |
| Price level to expect                               | R                      | R              | R         | W           | W        | W            | W               | W      | W             | W                     | F          | W                        |
| Price variance week-to-week                         | M                      | M              | L         | M           | M        | M            | H               | L      | L             | L                     | L          | L                        |
| Importance of shelf life versus taste               | L                      | L              | L         | L           | L        | M            | L               | H      | H             | M                     | L          | H                        |

\* H - high, M - medium, L - low, N - nil, R - retail, V - variable, W - wholesale, F- farmgate

Note that processing is included as one of the level 4 steps in Figure 2. Processors require very high volumes of throughput in order to attain the economies of scale needed to be competitive. Literally, California scale processing is not the “lowest hanging fruit” for Missouri produce growers. There is still much that can be done to increase fresh fruit and vegetable markets. In addition, it’s important for growers to remember that processing markets almost always have lower prices and smaller margins than fresh markets. However, an aspect of processing markets that bears monitoring is that many processed vegetables can be harvested mechanically. With increasing difficulties accessing labor, processing could become more important.

What does merit some attention is small scale value-added processing. In the European market model, there are many small localities that have established a worldwide reputation for specific value-added products, some of which are not-so-small scale anymore. Missouri has the potential to do the same making small scale value-added products from base fruits such as elderberries, strawberries, wines, etc. and vegetables such as summer squash, butternut squash, beets, potatoes, and turnips.

Figure 2. Supply chain steps in expanding fruit and vegetable production



In order to significantly expand fruit and vegetable production, grower's must be able to push through into levels 3 and 4. In order to understand how to push through these obstacles, the next section discusses each of the levels. We included the experience from interviews with over 50 Missouri fruit and vegetable growers at different production levels. Levels 1 and 2 set the context where a large portion of Missouri fruits and vegetables are marketed today and how these markets might grow in the future. The most critical step for the next five years is helping Missouri growers get to level 3.

### Level 1: low volume markets

The majority of Missouri fruit and vegetable growers are very small, often less than 4 acres. Missouri's small growers sell nearly all of their produce through farmers' markets, produce auctions, U-pick markets, local grocers, and local Community supported agriculture (CSA). Growers are highly interested in accessing new markets and several mentioned they would like to have help accessing larger markets that could enable them to produce more. Several growers who have marketed primarily at farmers' markets for five or more years felt that the markets were saturated in their local areas and they have branched out to marketing at multiple farmers' markets with limited success.

Small growers indicated that they preferred the farmers' markets because they could get retail prices for their products but noted that it was time consuming and they didn't always sell out of everything. Several

mentioned taking surplus production to the auction markets but felt they were taking a significant price discount. Compared with the farmers' market, auction market prices should run lower because the buyers attending the auctions are expecting to pay wholesale prices. The auction markets can also vary significantly from week-to-week. However, an important advantage of auction market is that generally all of the grower's production brought to the auction is sold. One of the hurdles that growers must face as they move towards commercial production volumes is that most of their buyers will be paying wholesale, not retail prices.

### ***Farmers' Markets and roadside stands***

Beginning and small growers usually target the local farmer's markets as their initial marketing outlet. Some growers have roadside or farm stands but some noted that the volumes sold have declined in the past few years (even pre-COVID-19).

Growers prefer farmer's markets because the prices they receive may be the same or higher than retail grocery stores. The growers commented that they appreciate good farmers market managers. They indicated that it was helpful when the farmers market managers do not allow "dumping" of products at low prices and keep things organized in a way that eases the logistics for growers such as assigned locations rather than first come, first serve.

Some growers in this stage do not have a good awareness of prices and are just looking for another source of revenue perhaps without understanding their costs fully. Competing growers get frustrated when these growers "dump" fruits and vegetables on the market at low prices (below the cost of production) lowering revenues for everyone.

Some of the more successful growers who marketed all of their produce through farmer's markets indicated that it was very important to provide customers with a back story about how the produce was grown, its health benefits, its country of origin, and/or how they became interested in growing it. The backstory is what builds a relationship with customers and foreshadows agritourism. Although not the focus of this study, agritourism can often proceed from selling at the farmers market and can represent another possible revenue stream.



March 21, 2019. High Tunnel for Tomato Production (dormant phase), Caulfield, MO (Howell County)

**Marketing through Farmers Markets**

| <b>Advantages</b>                                                                                                                                                  | <b>Disadvantages</b>                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Grower is able to get retail prices                                                                                                                                | Growers can only sell limited quantities and often cannot sell completely out of product. Growers may have to sell in multiple Farmers Markets |
| One of the least complex ways to market fruit and vegetables, but still requires coordination with the Farmers Market manager                                      | Some Farmers Market are more strictly managed including strong suggestions on the types of produce you can supply                              |
| Direct access to customer to learn consumer preferences and market trends                                                                                          | Some competitors at Farmers Markets will “dump” products at below the cost of production                                                       |
| Minimal paperwork and limited regulations to comply with                                                                                                           | Requires the ability to manage many small monetary transactions and may require the ability to take electronic payment forms                   |
| Depending on the Farmers Market, may have more flexibility to try different produce types                                                                          | Requires significant grower labor to attend farmers markets to sell products and does require an annual fee for the space                      |
| Grower is able to invent their own marketing materials and displays and provide a sense of agrotourism by providing a backstory on how their produce was produced. | Depending on how the market is managed, the grower may have to arrive extremely early to get the prime spot                                    |

**Marketing through Roadside Stands**

| <b>Advantages</b>                                                                 | <b>Disadvantages</b>                                                                                                   |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Grower is able to get retail prices                                               | Unlikely to sell the same volume as Farmers Market because it's difficult to get as many customers at a roadside stand |
| Flexibility to sell any produce within state rules                                | May need additional liability insurance                                                                                |
| Grower has complete control of location and hours of operation                    | Current Missouri growers selling through roadside stands suggest declining customers at Farmers Markets                |
| Not necessary to have electronic communication to customers but it can be helpful |                                                                                                                        |

***Community supported agriculture (CSA)***

CSA's can be a very successful market outlet for fruit and vegetable growers. However, all successful CSA operators specifically mentioned not only the importance of customer relationships, but also the additional labor cost of maintaining direct customer relationships and accommodating customer preferences. Several growers suggested that new growers focus on producing their specialty crops for a few years and sell at the Farmers' Market before trying to market through a CSA. It is important to get to

know how to manage each crop, automate where appropriate, and correctly apply hired labor resources to free up time to manage the operation. CSAs require a significant amount of online work to set up websites, a Facebook page, and/or utilize an App that customers can use to customize their weekly orders. Part of the art of marketing a CSA is to make the customer feel a part of the grower operation filling in as much backstory about the history of the operation and the production methods used. All CSA managers interviewed indicated that they provided direct delivery to customers and often had 2 to 3 part time employees focused on deliveries. Growers who have successfully managed CSAs are usually located next to large metropolitan areas and may support approximately 75 – 125 consumers. CSA managers also indicated that it was best to specialize in a few items rather than trying to supply everything customers wanted. Several CSA managers found that by working with other small growers, they could each specialize in the production of certain fruits and vegetables (as well as specialty meats) and this actually ensured they could produce more reliable supplies and increase customer retention.

### **Marketing through Community Supported Agriculture**

| <b>Advantages</b>                                                          | <b>Disadvantages</b>                                                                                       |
|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Grower is able to maintain retail prices                                   | Customer service intensive (time consuming)                                                                |
| Upfront “subscriptions” help provide cash flow even before planting        | Requires online marketing                                                                                  |
| Direct access to customers to learn consumer preferences and market trends | Often requires product delivery                                                                            |
| Customer feels they are a part of the local food production process        | Can be very challenging to manage specific consumer demands but web tools and apps are improving.          |
| Customer feels good about supporting local farmers                         | Beginning growers may want to perfect growing methods before jumping straight into marketing through a CSA |

### **Restaurants**

Many of the grower’s interviewed had experience with selling to restaurants and a few had worked with hotels. There were a range of positive and negative experiences. On the positive side, many growers were able to expand their production to service the restaurant and balance their marketing portfolio by having a new customer. Selling to local restaurants is also usually a fairly easy step from selling at Farmers’ markets. Restaurants typically pay wholesale prices but may pay a little more if you have high quality products that their customers like. Restaurants are usually not able to vary their prices because their menus are printed so most will not want to vary the price they are paying. It is also important to remember that restaurants are sensitive to delivery times and strictly adhering to their preferred delivery schedule will help build rapport. Restaurants may also want to be able to jump online and adjust orders

on a daily basis to reflect customer demands so it may be important for the grower to have an electronic ordering system that the restaurant owner can use. Restaurant owners may also wish to place their order very late in the evening after they have closed their food service for the day.

On the negative side, some growers have had difficulty getting paid especially if the restaurant was having financial difficulty. One grower relayed that he had provided 3 weeks of vegetable deliveries without payment only to arrive the fourth week and find the restaurant out of business. Some growers reported that they had been delivering products on a regular basis only to be told there would be no more orders because a competitor had offered a lower price. In order to avoid this experience, it is important to build a strong rapport with the restaurant owner.

### **Marketing to Restaurants**

| <b>Advantages</b>                                                                           | <b>Disadvantages</b>                                                                                  |
|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Relatively easy way to expand produce sales                                                 | Restaurants usually want to pay closer to wholesale prices rather than retail prices                  |
| Generally, a regular, predictable buying pattern                                            | Restaurants have specific delivery times that must be met.                                            |
| Restaurants may be willing to pay above wholesale prices for products customers really like | Often requires product delivery                                                                       |
| Less time consuming to market to higher volumes to restaurants                              | Restaurants operate with a printed menu and don't have flexibility to adjust prices within the season |
| Less stringent labeling requirements                                                        | Restaurants will likely require an electronic ordering system                                         |

### **Level 2: moderate volume markets**

In order for growers to move from low volume markets to higher volume markets there are some significant changes in the way they have been doing business that must occur. The first big change is that growers must change their expectations about the prices they receive. Generally, this means that higher volume markets will largely be paying wholesale market prices and/or even farmgate prices depending who transports the produce. It's important to remember that when growers move to the wholesale markets, they generally spend less time on marketing and dealing with individual customers. In addition, higher volume markets such as produce auctions sell everything brought (provided it is of acceptable quality) whereas growers that sell at Farmers' Markets may frequently find that they do not completely sell out of their produce. Growers that have moved from level 1 to level 2 markets note that the increase in volume sold more than offsets what is lost in accepting wholesale prices. Some innovative growers have been able to use CSAs to still retain the retail price but this is rare and volumes are still limited.

Many of the varieties of fruits and vegetable used by small scale growers are selected for taste preferences. But many varieties that taste good don't have a long shelf life. For example, tomatoes harvested from large farms in California or Mexico are often picked green, ripened in a truck on the way to market, and have a shelf life of 6 weeks where as many varieties produced by local farmers for the farmers market may have a shelf life closer to 4 to 6 days. Geneticists are experimenting with how to get longer shelf lives and it would appear that there may be opportunities for plant breeders to develop tomatoes that taste good and have a long shelf life. However, currently there is a trade-off between taste and shelf life and growers must acknowledge that when producing larger volumes, the produce must have a longer shelf life. In most cases, growers must select different varieties with a longer shelf life.

### ***U-pick markets***

U-pick markets can be a stepping stone to selling larger volumes of produce and growing farm revenues. The main advantages of u-pick marketing are that the grower does not have to harvest, transport, and market a significant portion of the production and there are opportunities for agritourism that could be an additional source of revenue for the farm. Innovative growers offer “wagon rides” around the farm discussing the farm history, crop production aspects, fun facts about the fruit or vegetables, sometimes discussing production struggles, and providing a general storyline that is engaging to predominantly urban families. Some researchers have indicated that u-pick markets are on a declining trend, but recent evidence suggests this may be changing based on the interviews we conducted. Growers used Facebook as a medium to advertise and develop a backstory (history) for both U-pick and CSA enterprises.

U-pick marketing is not without its challenges. Rarely does the general public pick a patch thoroughly and the grower will likely have to do a final clean picking. In addition, the general public may need some instruction on picking for crops where incorrect harvesting could damage next year's crops. Growers will also need to have access to handwashing and drying stations, restrooms, additional supervision to ensure they stay in the assigned picking area and behaving in a safe manner, and will likely need additional liability insurance.

### **Marketing through U-Pick Programs**

| <b>Advantages</b>                                                                              | <b>Disadvantages</b>                                                                         |
|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Grower does not have to harvest, transport, and market a significant portion of the production | Customer service intensive (time consuming) and marketing intensive (i.e., Facebook, etc.)   |
| Grower can charge above wholesale prices and maybe close to retail prices                      | Customers may need some instruction on harvesting techniques                                 |
| Direct access to customers to learn consumer preferences and market trends                     | Customers will not cleanly pick fruits and growers should plan on performing a clean picking |

|                                                                                                                 |                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Grower has the opportunity for a new agrotourism revenue stream. Many growers provide tours of their operations | Growers need to provide restrooms and handwashing stations                                                                                             |
| Customer feels good about supporting local farmers and takes some ownership in the production process           | Growers will need additional liability insurance due to having customers on their farming operation and may need to restrict access to certain markets |

### ***Produce Auction markets***

For many of Missouri's growers, produce auction markets represent a relatively easy method for marketing additional production. As the census data shows, the auction markets brought expansion to Missouri's protected culture production. Two different auction managers were interviewed about their impression of how the auction markets were doing. The managers recognized that there were obvious periods where supply exceed demand contributing to the price variability week-to-week. One auction manager indicated that in anticipation of excess supply periods, he had contracted supplies through brokers and/or wholesale buyers to deliver to urban markets such as the Kansas City metro market. In interviewing the auction managers, it was clear that they were quite innovative and had strong relationships with their customers. The success of auction markets is tied to high tunnel production. In Figure 3, revenues from vegetables produced in protected culture growing from \$1.9 million to \$5.5 million over the 2007 to 2017 period.



Winter Production of "Salad Mix"  
Vegetables, Granby, MO (Newton County).  
Photo taken Jan 28, 2019.

**Marketing through Produce Auctions**

| <b>Advantages</b>                                                                                                                                     | <b>Disadvantages</b>                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Provides growers access to a much larger volume market and is an easy step from Farmers' Markets without a lot of additional paperwork                | Produce auctions do experience more price variability sale to sale than observed in terminal markets.                                                   |
| All produce that the grower brings to the produce auction is sold – no leftovers                                                                      | Produce auctions do not have cooling facilities available and typically do not handle highly perishable products                                        |
| Produce auction prices are generally consistent with and occasionally modestly higher than terminal market prices, even with higher price variability | Produce auctions have specific packing requirements that generally mimic industry standards. Growers will have additional costs for packing containers. |
| Produce auction markets generally operate over most of the year. For example, the Central Missouri Produce Auction operates March to early November   | Buyer and seller attendance vary week-to-week which contributes to the price variability experienced in auction markets.                                |
| Growers have excellent pricing opportunities for specialty crops marketed early in the season                                                         | Growers will pay marketing fees to produce auctions typically 9-12% higher.                                                                             |

Figure 3. Greenhouse or high tunnel vegetables and herbs for selected counties in Missouri (sales in \$1,000)

| Counties                            | 2007  |         |       | 2012  |         |       | 2017  |           |       | % increase in sales<br>over 2012 | % increase in sales<br>over 2007 |
|-------------------------------------|-------|---------|-------|-------|---------|-------|-------|-----------|-------|----------------------------------|----------------------------------|
|                                     | farms | sq ft   | sales | farms | sq ft   | sales | farms | sq ft     | sales |                                  |                                  |
| Audrain                             | 5     | 14,552  | 109   | 13    | 35,281  | 179   | 15    | 80,999    | 546   | 206%                             | 400%                             |
| Barton                              | 3     | 7,488   | 56    | 10    | 36,980  | 173   | 11    | 83,672    | 605   | 249%                             | 977%                             |
| Dallas                              | 3     | 6,360   | 48    | 13    | 81,244  | 287   | 14    | 112,375   | 236   | -18%                             | 391%                             |
| Daviess                             | 5     | 20,360  | 124   | 20    | 134,444 | 405   | 11    | 95,616    | 494   | 22%                              | 297%                             |
| Benton                              | 4     | 38,700  | 220   | 4     | 28,500  | 86    | 5     | 10,080    | 63    | -27%                             | -71%                             |
| Johnson                             | 4     | 3,850   | 28    | 12    | 46,200  | 161   | 7     | 37,836    | 184   | 14%                              | 568%                             |
| <b>4 County Auction</b>             | 8     | 42,550  | 248   | 16    | 74,700  | 247   | 12    | 47,916    | 247   | 0%                               | 0%                               |
| Moniteau                            | 11    | 50,400  | 378   | 14    | 260,020 | 644   | 16    | 390,672   | 1,312 | 104%                             | 247%                             |
| Morgan                              | 15    | 89,740  | 675   | 17    | 97,553  | 444   | 20    | 262,517   | 1,701 | 283%                             | 152%                             |
| <b>Central Auction</b>              | 26    | 140,140 | 1,053 | 31    | 357,573 | 1,088 | 36    | 653,189   | 3,013 | 177%                             | 186%                             |
| Vernon                              | 5     | 23,815  | 186   | 19    | 213,516 | 451   | 9     | 46,584    | 298   | -34%                             | 60%                              |
| Bates                               | 3     | 6,000   | 43    | 4     | 28,500  | 86    | 1     | 5,176     | 25    | -71%                             | -41%                             |
| <b>Rich Hill Produce Businesses</b> | 8     | 29,815  | 229   | 23    | 242,016 | 537   | 10    | 51,760    | 323   | -40%                             | 41%                              |
| <b>Total</b>                        | 58    | 261,265 | 1,867 | 126   | 962,238 | 2,916 | 109   | 1,125,527 | 5,463 |                                  |                                  |
| % increase from previous census     |       |         |       | 117%  | 268%    | 56%   | -13%  | 17%       | 87%   |                                  |                                  |

Yellow highlighted box for sales are adjusted as follows: square footage was multiplied by average sales per sq ft for that year. Average sales per sq ft was calculated by summing sales from counties without a yellow highlight, of that given year, and then divided by the corresponding square footage. The square foot for the operation in Bates County in 2017 is based on the average size of an operation in Vernon County in 2017.

***Auction market price versus other market prices***

One of the biggest innovations in Missouri fruit and vegetable marketing has been the addition of the produce auction market that enabled growers to sell larger volumes while reducing their marketing time. One of the concerns often stated in the interviews was that auction markets have lower prices than selling at the Farmers' Market. However, this is to be expected because auction markets are effectively a wholesale market. Their prices should resemble terminal market prices. For example, many of the customers of auction markets are grocery stores and they can buy from terminal markets just as easily as produce auctions.

In order to determine if the auction market prices were significantly lower than terminal prices daily sales data were collected for 2019 and 2020 from the Central Missouri Produce Auction (CMPA). The data was then averaged to generate monthly prices for comparison with monthly Midwest U.S. retail prices and Chicago terminal market prices as reported by USDA-AMS as well as the US average farm price as reported by USDA-NASS. Importantly, many of the prices were reported in different units of measure. All prices, with the exception of sweet corn, were converted to a dollar per pound basis to allow for consistent comparison. Importantly, the Midwest US region is broader than the Chicago terminal price so the retail and wholesale (terminal) prices are not perfectly comparable. One would expect the retail price to be higher than the wholesale price and the wholesale price to be higher than the farm price. One would also expect the CMPA price to be similar to the wholesale (terminal) prices although possibly slightly lower because Chicago is a major urban city. CMPA prices would also be affected by local supply and demand conditions although some of this variance would be removed by taking a monthly average.

The graphs presented on the following pages include the data for various vegetable crops important to Missouri. In each graph the blue line is the retail price, the red line is the wholesale price, the black line is the CMPA price and when relevant, the green line is the US average farm price. While there are some exceptions, the majority of the auction prices are slightly below to significantly above the wholesale price. Some auction prices such as asparagus, round green beans, and long seedless cucumbers are significantly above the wholesale prices for portions of 2019 and 2020. Colored bell peppers and heirloom tomatoes seem to fall consistently below the wholesale prices for portions of 2019 and 2020. Winter squash prices are difficult to compare because CMPA does not report specific prices for the different types but they do not seem to be too far off with the possible exception of grey squash.

This rough comparison of historical CMPA prices does not suggest the prices are grossly inconsistent with wholesale price as reported for terminal markets, and in fact, the auction market prices appear to run above the terminal market prices for some crops. Growers should be aware that auction markets do charge a 9 to 12 percent sales commission on what they sell. As indicated through the grower interviews,

this commission likely contributes to some growers' perceptions that they get lower prices at auction markets versus Farmers' Markets.

High tunnels: A game changer for Missouri fruit and vegetable production

The rapid adoption of high tunnels in Missouri has been driven both by the significant benefits of high tunnels as well as the cost share assistance available through USDA's Environmental Quality Incentives Program (EQIP) program. The benefits of high tunnels include:

- Extended growing season
- Improved plant and soil quality
- Reduced nutrient use
- Reduced pollen drift
- Reduced energy use and improve air quality by providing consumers with a local produce

High tunnel cost share assistance through USDA's EQIP program can cover a significant portion of the cost of the high tunnel. Growers often add additional funds to upgrade beyond the minimum requirements and minimize fixed costs per square foot. A good step-by-step guide for the EQIP program can be found at:

<https://www.tunnelvisionhoops.com/blogwhat-is-the-nrcs-high-tunnel-initiative-grants-for-high-tunnels/>

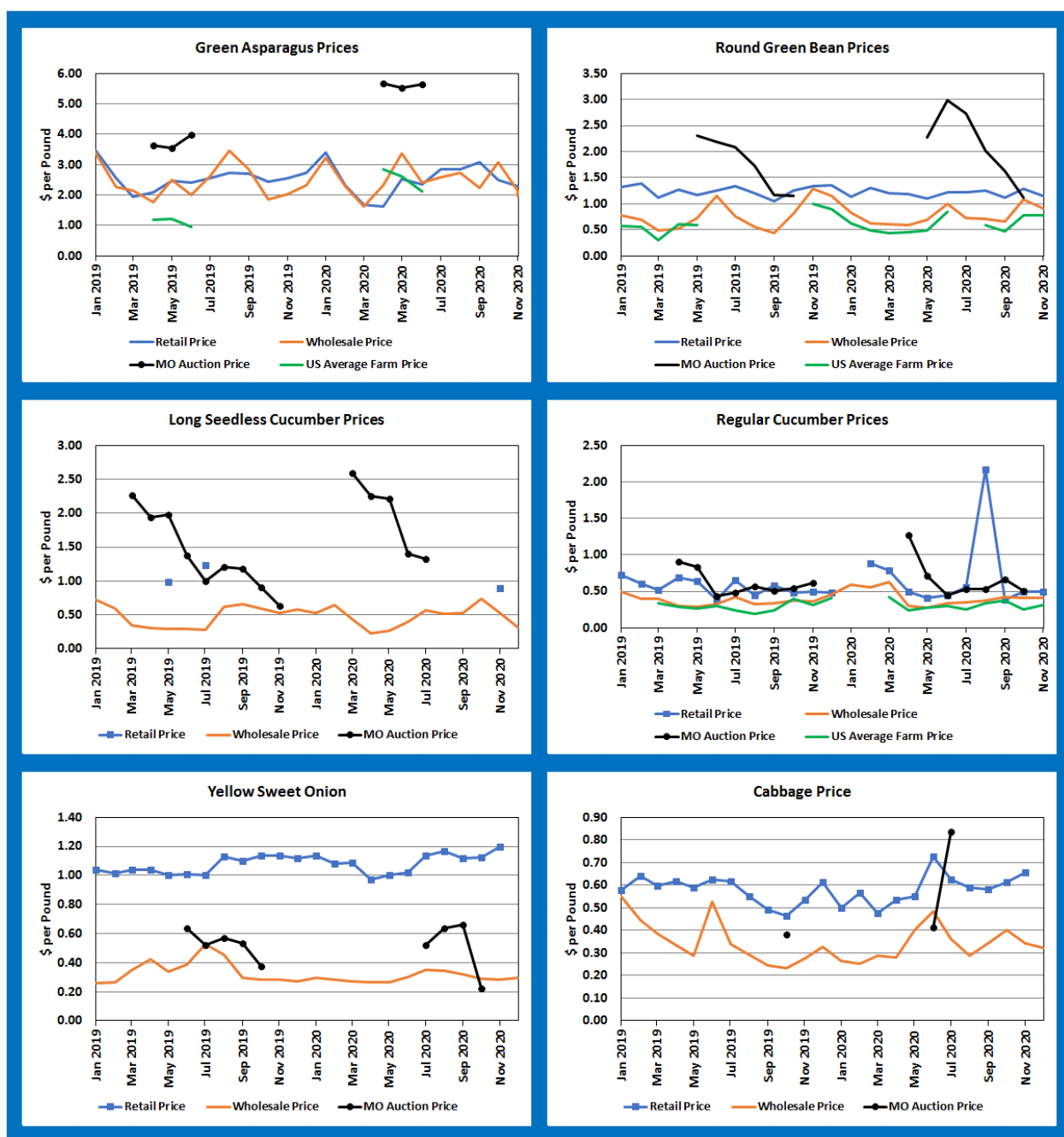
While the cost of constructing a high tunnel can vary considerably, the budget below is adapted from a Kansas budget. There are several companies that manufacture the construction materials.

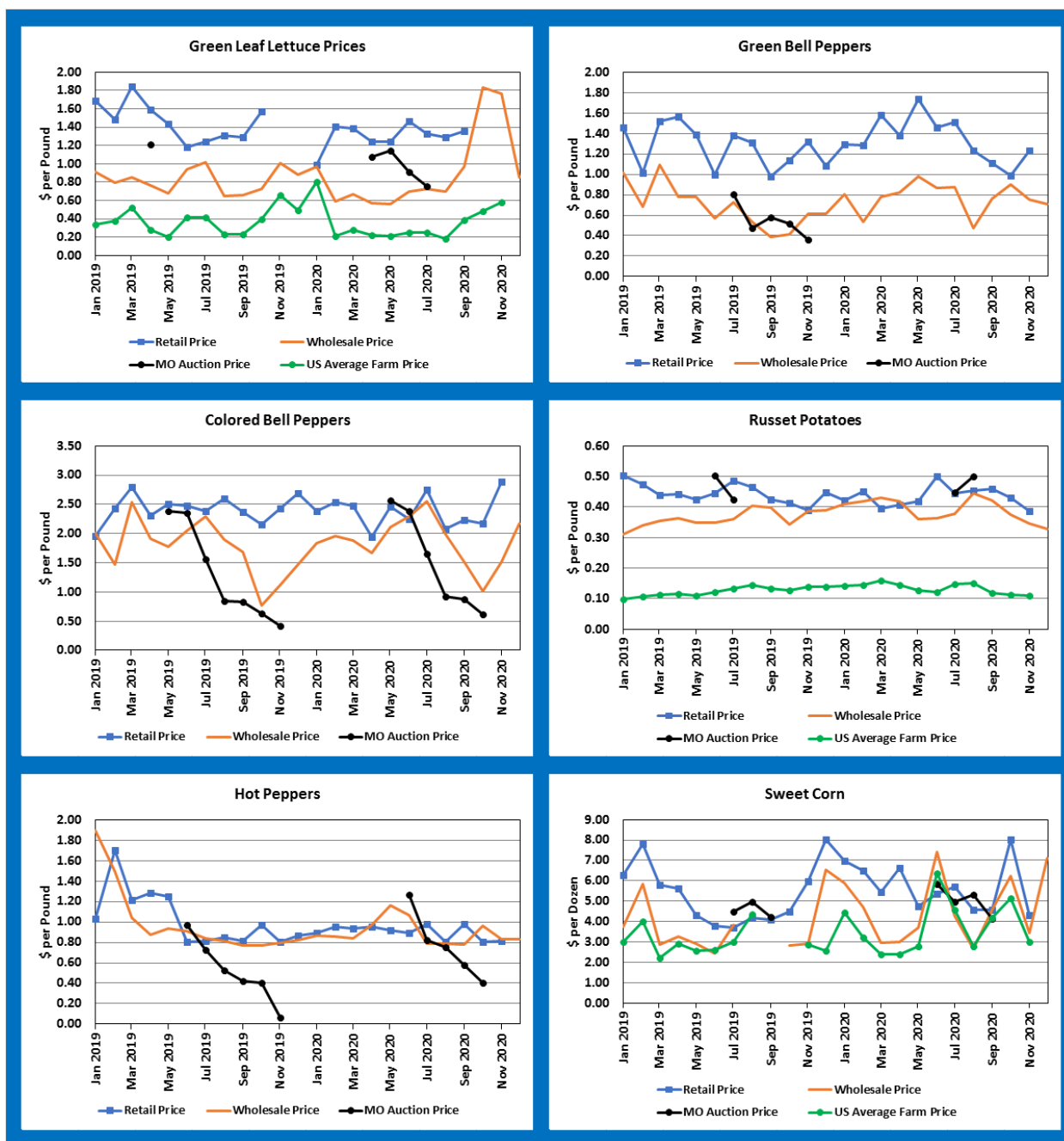
#### Construction Costs of High Tunnels, \$/2000 square feet

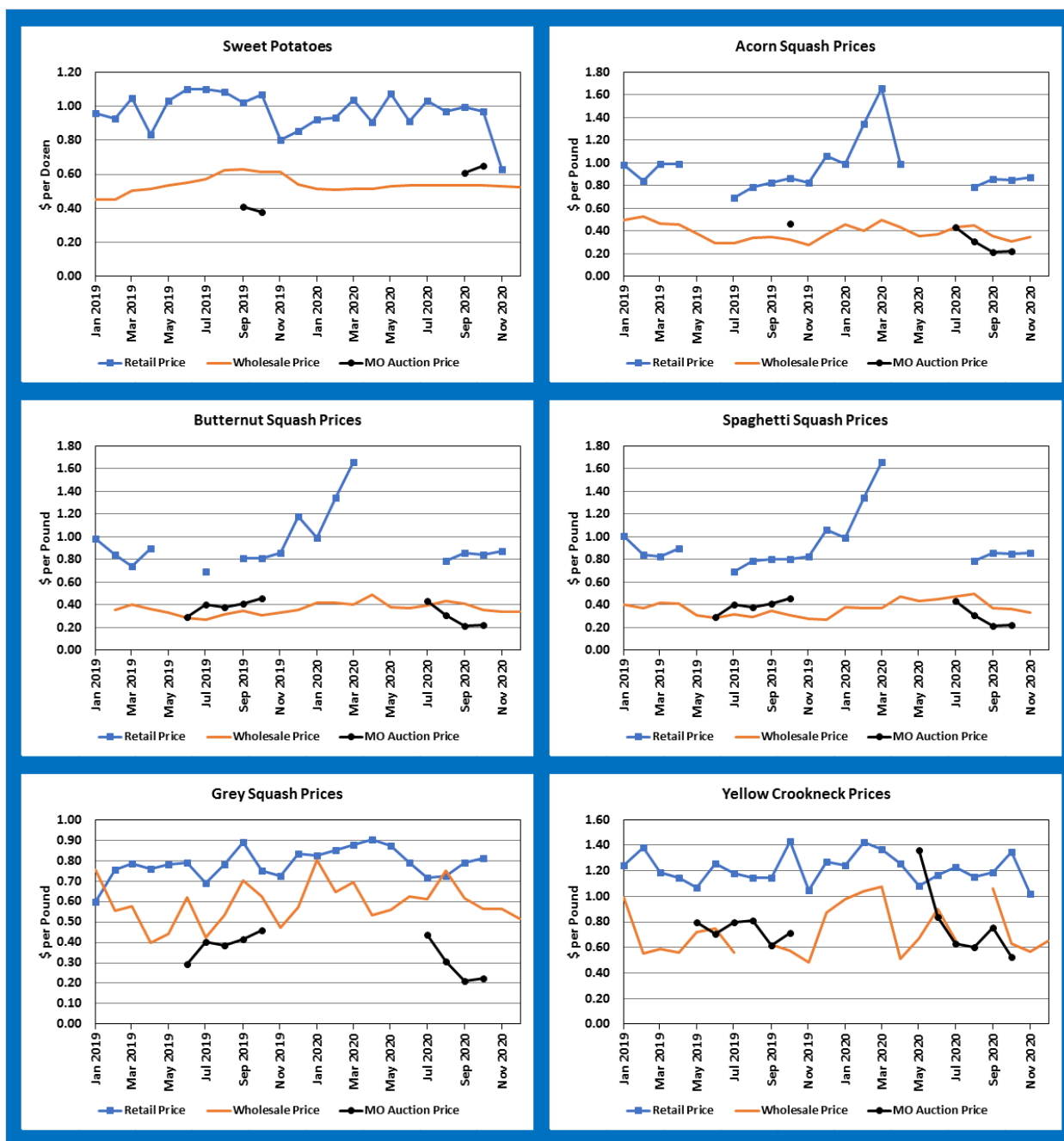
| Component                            | Labor             | Machinery       | Materials         | Total Cost         | Useful Life | 10 year Cost       |
|--------------------------------------|-------------------|-----------------|-------------------|--------------------|-------------|--------------------|
| Site evaluation and soil preparation | \$312.88          | \$69.85         |                   | \$382.73           | 10          | \$382.73           |
| Trenching and laying water pipes     | \$14.20           |                 | \$100.00          | \$114.20           | 10          | \$114.20           |
| Inserting poles and setting posts    | \$283.92          | \$159.24        | \$211.20          | \$654.36           | 10          | \$654.36           |
| Assembling the frame                 | \$283.92          |                 | \$7,048.80        | \$7,332.72         | 10          | \$7,332.72         |
| Treating and setting baseboards      | \$94.64           |                 | \$119.64          | \$214.28           | 10          | \$214.28           |
| End and sidewall installation        | \$473.20          |                 | \$337.00          | \$810.20           | 10          | \$810.20           |
| Pulling plastic                      | \$94.64           |                 | \$656.00          | \$750.64           | 3           | \$2,502.13         |
| Channel lock installation            | \$23.66           |                 |                   | \$23.66            | 10          | \$23.66            |
| Shutter vents                        | \$0.00            |                 | \$612.00          | \$612.00           | 10          | \$612.00           |
| Trellis purlin installation          | \$141.96          |                 | \$221.30          | \$363.26           | 10          | \$363.26           |
| Electrical                           | \$116.56          |                 |                   | \$116.56           | 10          | \$116.56           |
| Miscellaneous hardware and tools     |                   |                 | \$100.00          | \$100.00           | 10          | \$100.00           |
| <b>Total Cost</b>                    | <b>\$1,839.58</b> | <b>\$229.09</b> | <b>\$9,405.94</b> | <b>\$11,474.61</b> |             | <b>\$13,226.10</b> |

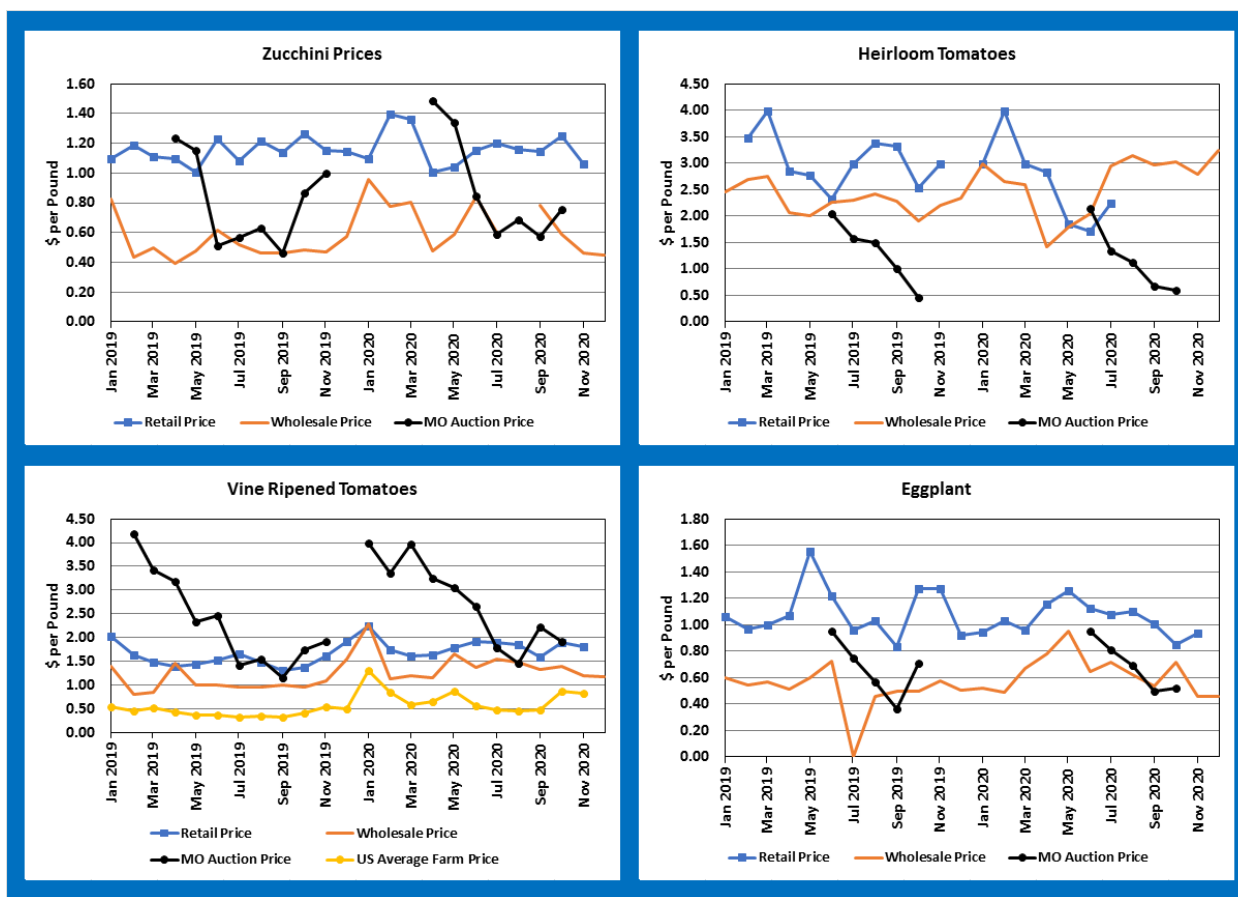
|                       |                 |
|-----------------------|-----------------|
| <b>Cost Per Month</b> | <b>\$110.22</b> |
|-----------------------|-----------------|

Adapted from Kansas high tunnel budgets developed by Tom Buller, Dr. Cary Rivard, and Kimberly Oxley.





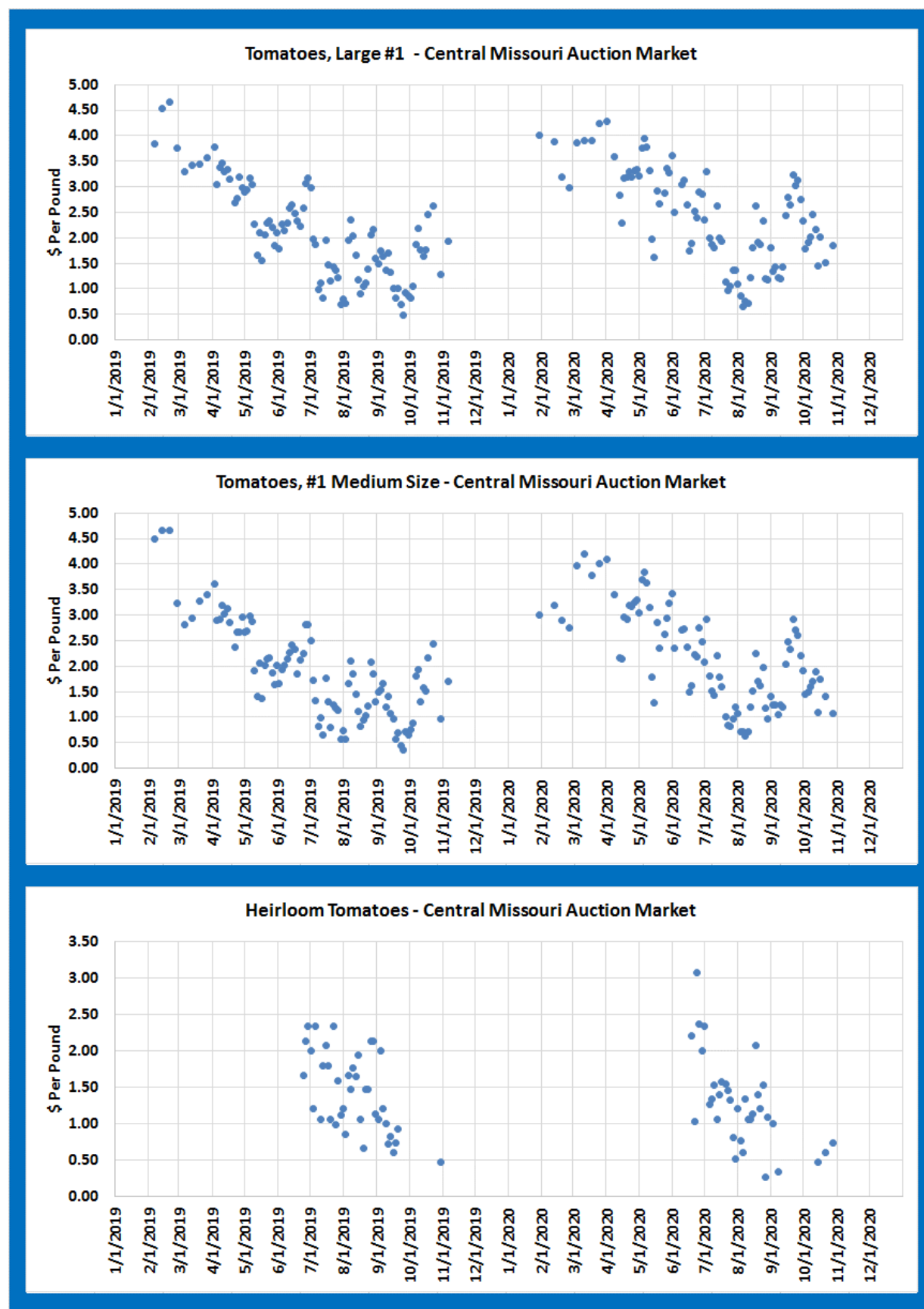


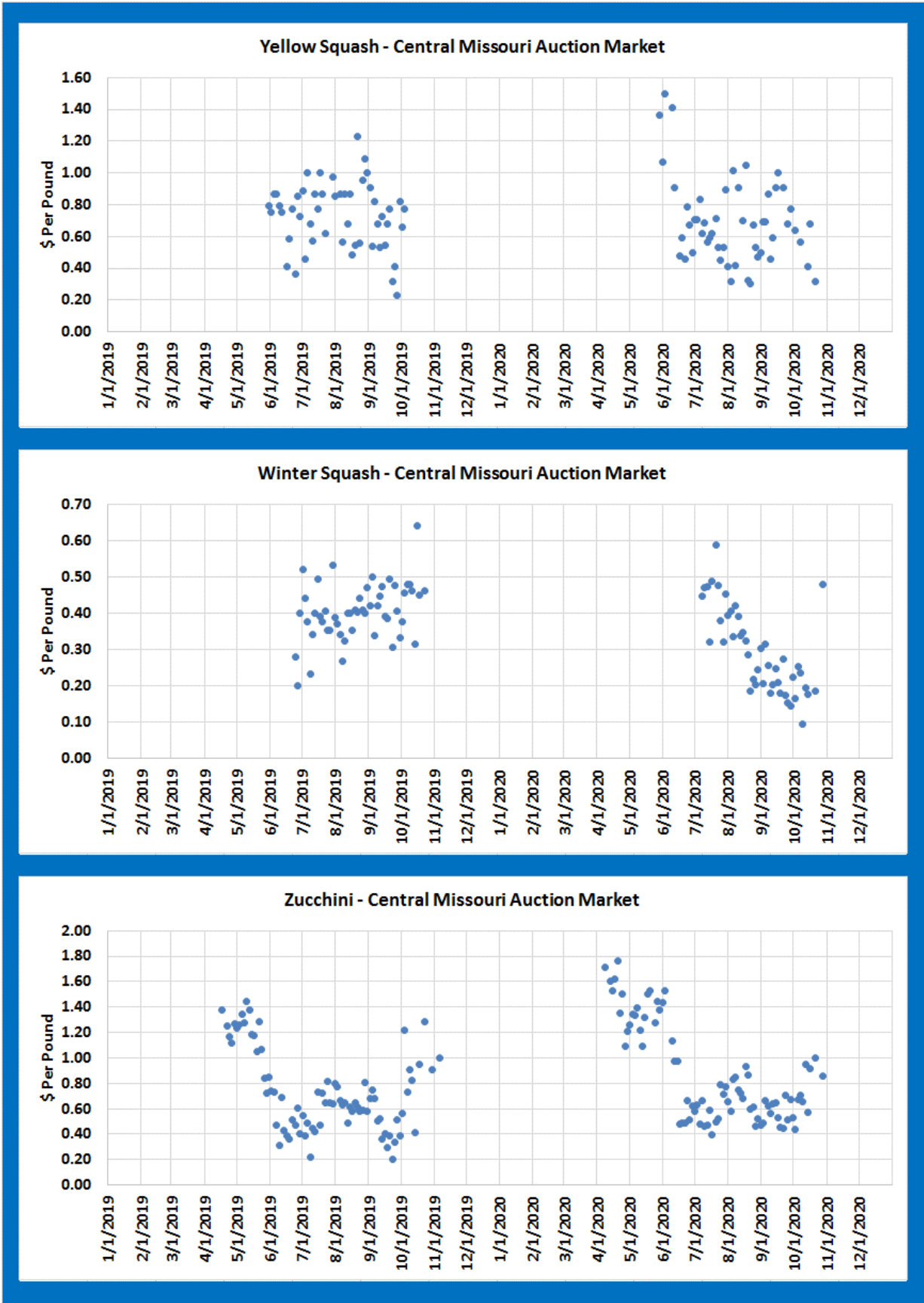


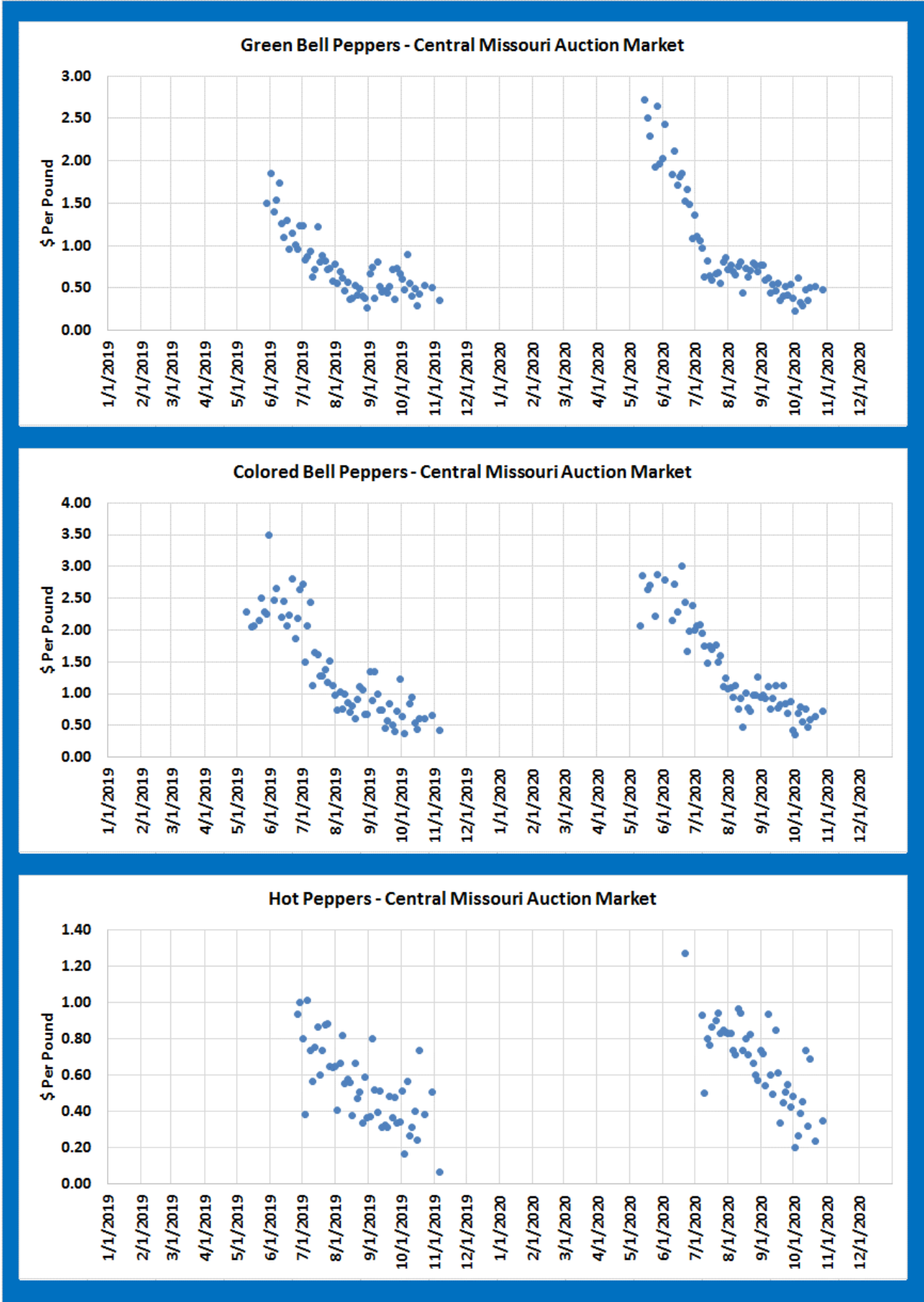
### ***Price variance at the produce auction markets***

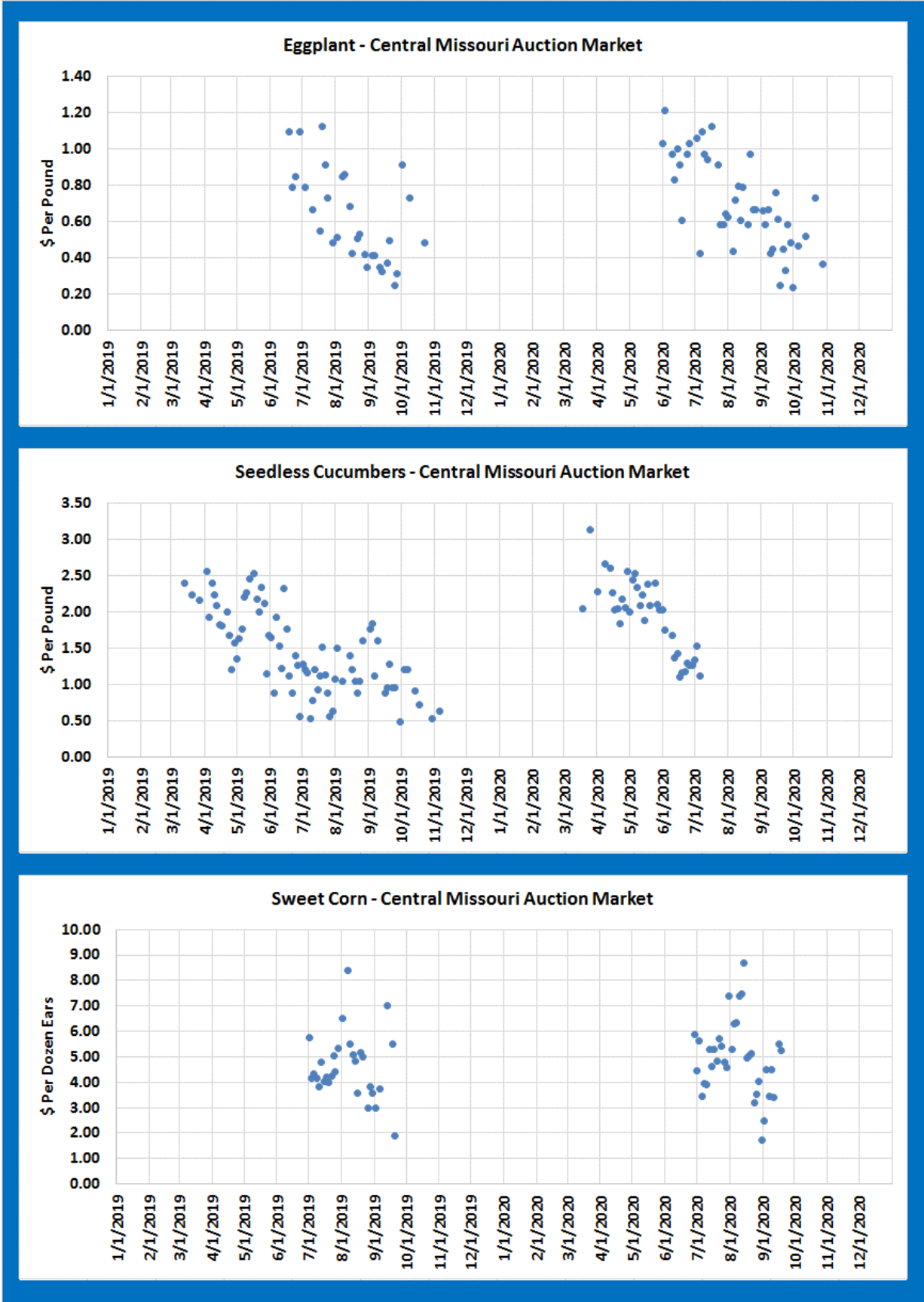
Growers' primary concern with the produce auction markets was the price variance they experienced week to week. In order to look at this issue, the prices observed in 2019 and 2020 from the Central Missouri Produce Auction (CMPA) were graphed choosing commodities with frequent sales across the season. The time period was kept the same in each graph so that you can see generally when the various specialty crops are marketed and that some crops have very narrow marketing periods. The CMPA is somewhat seasonal with the number of auctions increasing to three per week during the high production season (April to October). Tomatoes are one of the most popular products with growers because they are one of the most profitable products to sell. As the graphs below indicate, one can see the variability in the prices from auction to auction. The auction managers and participants indicated that this was due to variance in supply and demand conditions. At some auctions there might be an unusually large supply of a particular type of produce and sometimes there is variance in buyer attendance at the auction.

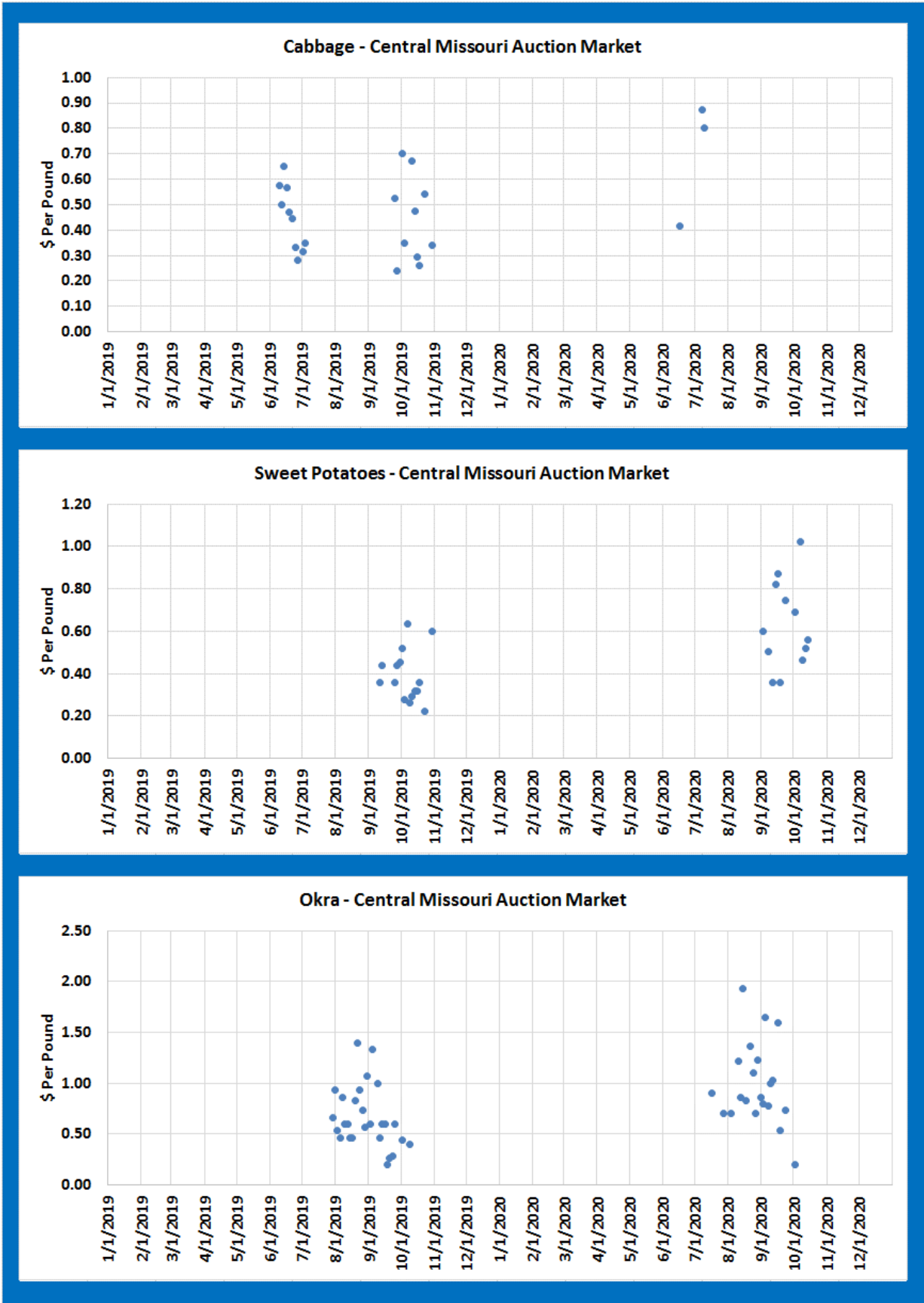
Careful examination of the graphs suggests that some products such as colored peppers, cucumbers, and zucchinis have less price variance than tomatoes, yellow squash, green beans, and sweet corn. The graphs also indicate a pervasive downward trend in produce prices from early in the season to late in the season. One of the key marketing opportunities for growers is to target marketing earlier in the season. Tomatoes and squash also appear to have a resurgence in prices in late September and early October, at least in the data presented.

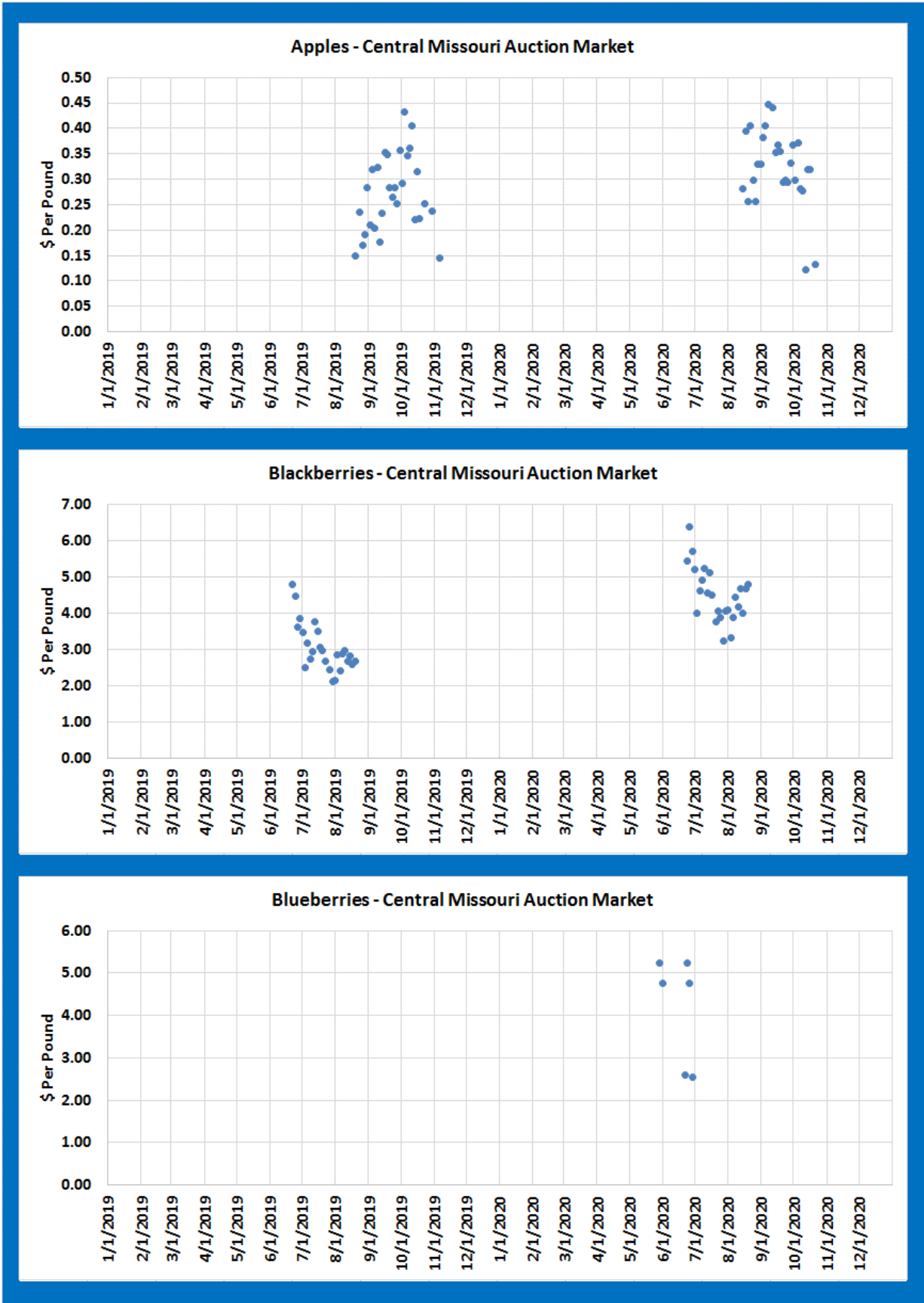


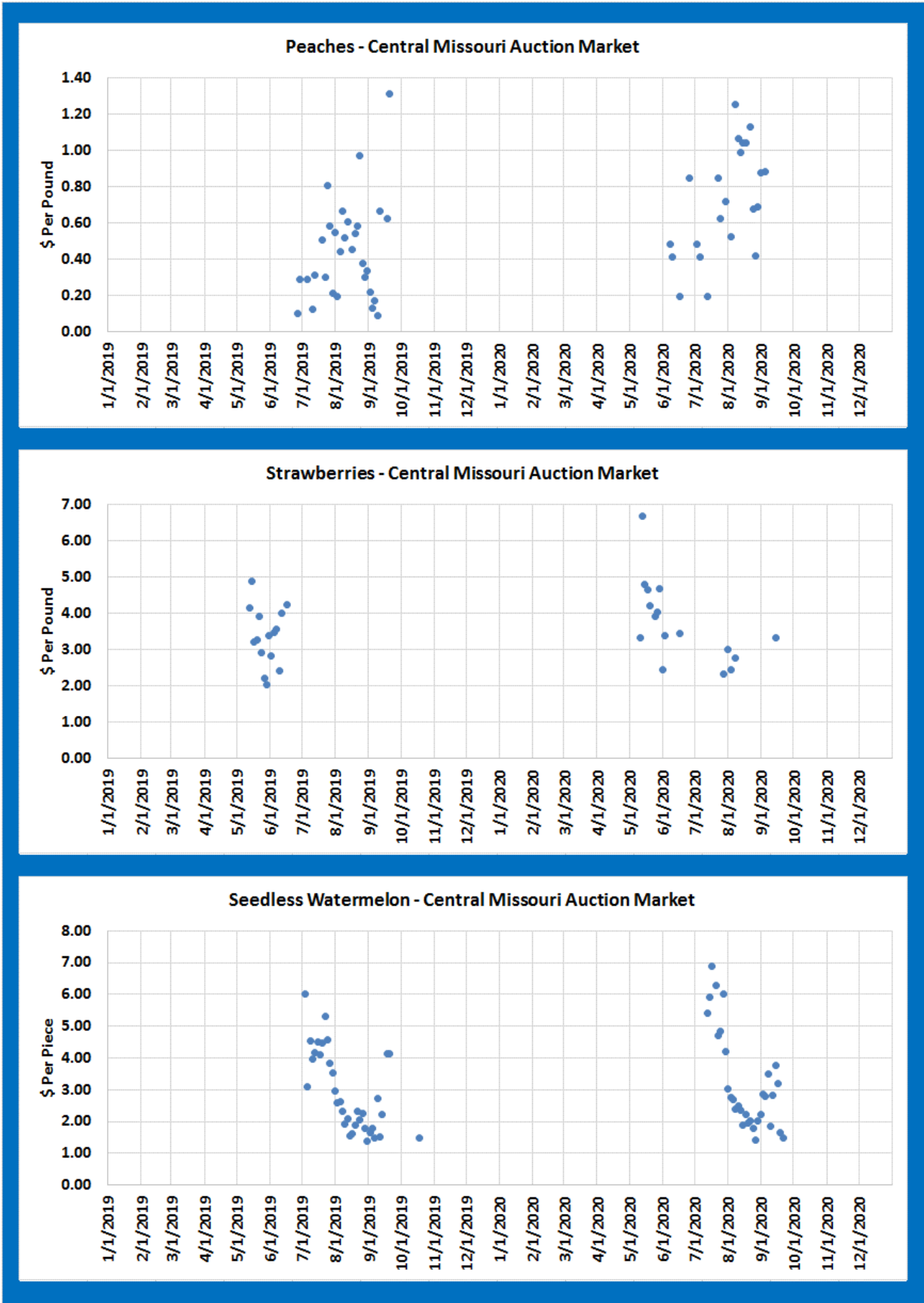


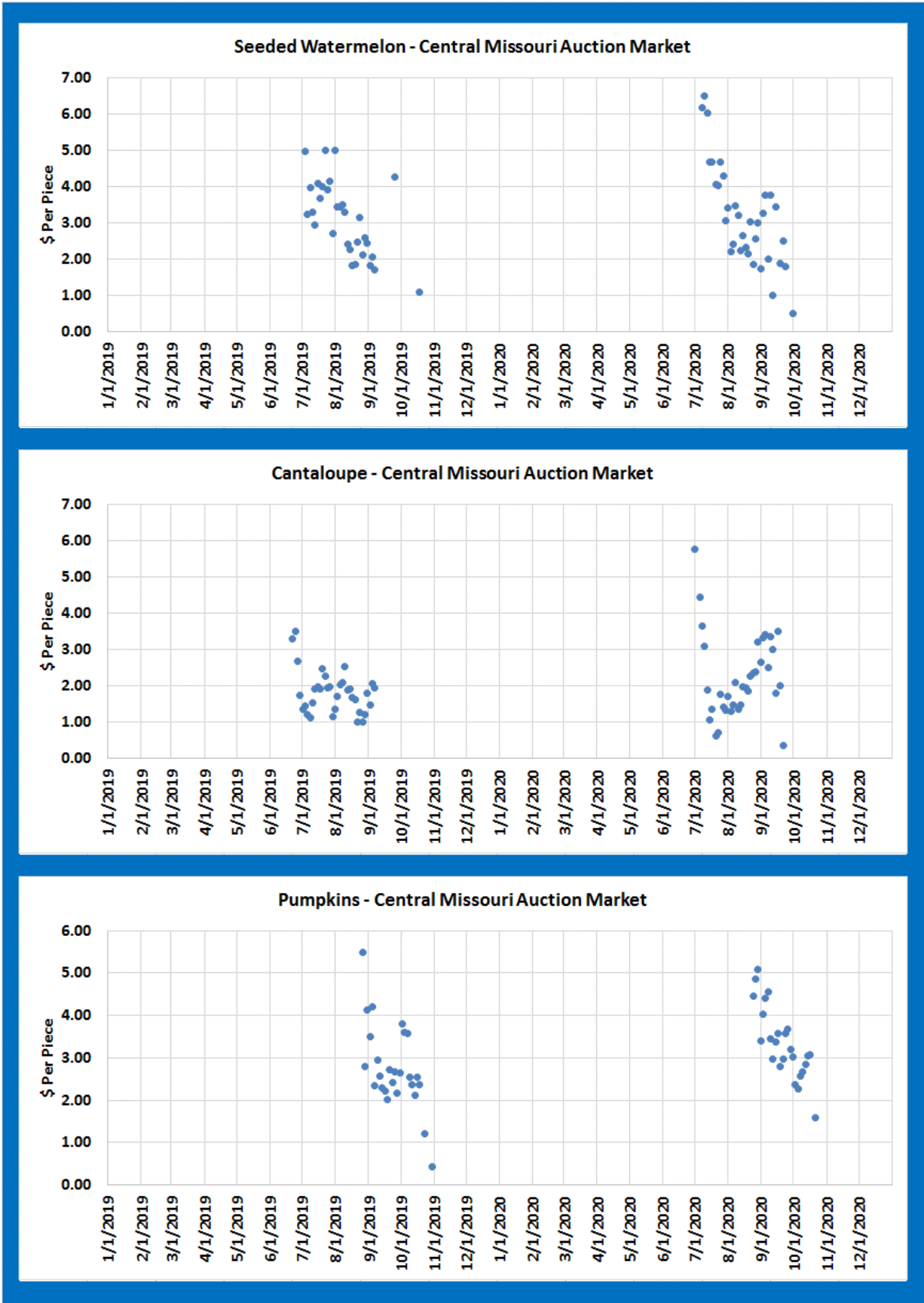












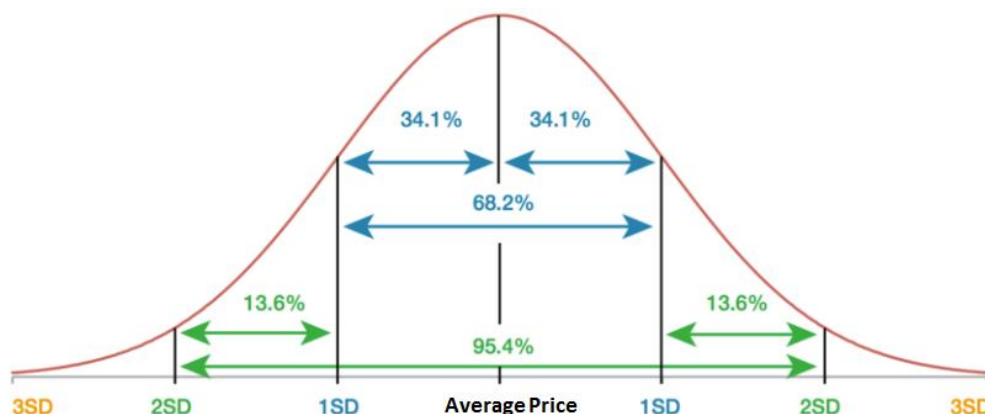
**Fruit and Vegetable Price Statistics at the Central Missouri Produce Auction**

| Specialty Crop        | Units    | 2019    |        |                    |          |          | 2020    |        |                    |          |          |
|-----------------------|----------|---------|--------|--------------------|----------|----------|---------|--------|--------------------|----------|----------|
|                       |          | Average | Median | Standard Deviation | Skewness | # of Obs | Average | Median | Standard Deviation | Skewness | # of Obs |
| Apples                | \$/lb    | 0.27    | 0.26   | 0.08               | 0.23     | 29       | 0.32    | 0.32   | 0.08               | -0.91    | 28       |
| Asparagus             | \$/lb    | 3.72    | 3.82   | 0.64               | -0.40    | 33       | 5.61    | 5.76   | 0.80               | -0.38    | 29       |
| Beans, Green (Snap)   | \$/lb    | 1.81    | 1.89   | 0.60               | -0.32    | 69       | 2.15    | 2.13   | 0.82               | 0.11     | 58       |
| Beets                 | \$/lb    | 0.38    | 0.38   | 0.10               | -0.04    | 27       | 0.37    | 0.38   | 0.08               | -0.15    | 17       |
| Blackberries          | \$/lb    | 3.04    | 2.88   | 0.66               | 1.11     | 25       | 4.50    | 4.49   | 0.74               | 0.55     | 25       |
| Blueberries           | \$/lb    |         |        |                    |          |          | 4.19    | 4.75   | 1.27               | -0.84    | 6        |
| Cabbage               | \$/lb    | 0.44    | 0.46   | 0.14               | 0.28     | 20       | 0.70    | 0.80   | 0.25               | -1.55    | 3        |
| Cantaloupe            | \$/piece | 1.82    | 1.85   | 0.59               | 1.05     | 34       | 2.24    | 1.97   | 1.13               | 0.96     | 35       |
| Corn, Sweet           | \$/dozen | 4.61    | 4.32   | 1.28               | 0.79     | 29       | 4.95    | 4.95   | 1.45               | 0.35     | 35       |
| Cucumbers, Regular    | \$/lb    | 0.58    | 0.57   | 0.20               | 0.47     | 80       | 0.61    | 0.55   | 0.25               | 1.81     | 77       |
| Cucumbers, Seedless   | \$/lb    | 1.44    | 1.28   | 0.57               | 0.27     | 77       | 1.94    | 2.04   | 0.51               | -0.05    | 38       |
| Eggplant              | \$/lb    | 0.62    | 0.53   | 0.25               | 0.50     | 31       | 0.70    | 0.66   | 0.25               | 0.15     | 46       |
| Lettuce, Green Leaf   | \$/lb    | 1.21    | 1.21   |                    |          | 1        | 1.05    | 1.00   | 0.30               | 0.30     | 26       |
| Okra                  | \$/lb    | 0.66    | 0.60   | 0.30               | 0.89     | 27       | 0.99    | 0.87   | 0.40               | 0.64     | 21       |
| Onions, Sweet         | \$/lb    | 0.54    | 0.58   | 0.16               | -0.27    | 46       | 0.53    | 0.56   | 0.21               | -0.24    | 45       |
| Peaches               | \$/lb    | 0.44    | 0.41   | 0.27               | 1.20     | 30       | 0.72    | 0.70   | 0.30               | -0.08    | 22       |
| Peppers, Colored Bell | \$/lb    | 1.36    | 1.12   | 0.77               | 0.70     | 68       | 1.39    | 1.12   | 0.74               | 0.68     | 64       |
| Peppers, Green Bell   | \$/lb    | 0.75    | 0.67   | 0.36               | 1.14     | 64       | 0.98    | 0.72   | 0.66               | 1.23     | 66       |
| Peppers, Hot          | \$/lb    | 0.54    | 0.51   | 0.22               | 0.30     | 53       | 0.66    | 0.71   | 0.23               | -0.08    | 47       |
| Potatoes              | \$/lb    | 0.47    | 0.50   | 0.14               | -0.19    | 5        | 0.45    | 0.45   | 0.11               | 0.41     | 15       |
| Potatoes, Sweet       | \$/lb    | 0.39    | 0.36   | 0.12               | 0.73     | 15       | 0.63    | 0.58   | 0.21               | 0.49     | 12       |
| Pumpkins              | \$/piece | 2.76    | 2.56   | 1.00               | 0.47     | 26       | 3.35    | 3.21   | 0.84               | 0.32     | 25       |
| Squash, Winter        | \$/lb    | 0.40    | 0.40   | 0.08               | 0.03     | 52       | 0.30    | 0.27   | 0.12               | 0.51     | 45       |
| Squash, Yellow        | \$/lb    | 0.73    | 0.77   | 0.21               | -0.24    | 51       | 0.69    | 0.67   | 0.27               | 1.11     | 52       |
| Strawberries          | \$/lb    | 3.36    | 3.37   | 0.80               | 0.02     | 15       | 3.71    | 3.42   | 1.13               | 1.11     | 16       |
| Tomatoes, Heirloom    | \$/lb    | 1.43    | 1.47   | 0.54               | 0.12     | 39       | 1.28    | 1.21   | 0.62               | 0.79     | 35       |
| Tomatoes, Large #1    | \$/lb    | 2.11    | 2.04   | 0.94               | 0.43     | 96       | 2.43    | 2.45   | 0.94               | 0.02     | 90       |
| Tomatoes, Medium #1   | \$/lb    | 1.90    | 1.84   | 0.94               | 0.69     | 96       | 2.17    | 2.15   | 0.93               | 0.29     | 90       |
| Watermelon, Seeded    | \$/piece | 3.12    | 3.22   | 1.04               | 0.13     | 31       | 3.18    | 3.05   | 1.40               | 0.62     | 34       |
| Watermelon, Seedless  | \$/piece | 2.93    | 2.59   | 1.28               | 0.61     | 35       | 3.21    | 2.77   | 1.56               | 1.03     | 31       |
| Zucchini              | \$/lb    | 0.73    | 0.65   | 0.32               | 0.61     | 81       | 0.87    | 0.70   | 0.39               | 0.77     | 81       |

Since auction markets have become a very critical market for Missouri specialty crop growers, the table above is included in order to document some of the statistics from the Central Missouri Produce Auction for 2019 and 2020. The “average” columns are the simple average of all prices reported across the marketing seasons for 2019 and 2020. The median is the middle value of price with half of the observed prices above that value and half of the observed prices below that value.

The standard deviation measures how spread out the prices are from the average. The larger the standard deviation the greater the spread of the data. For example, in the case of apples, the standard deviation is \$0.08 per lb with an average price of \$0.27 per lb. If the data are distributed normally, this would mean that approximately 68.2% of the observed prices would fall within \$0.19 and \$0.35 per lb. When data are distributed normally, they generally follow a bell curve pattern that looks like Figure 4 below.

*Figure 4. Probability of observations occurring within 1, 2, and 3 standard deviations of the average price in the Normal distribution*



It also means that 15.9% of the observed prices fell below \$0.19 per lb. while 15.9% of the observed prices were above \$0.35 per lb. The standard deviation helps growers understand the price risks associated with each specialty crop. Keep in mind that the standard deviation should also be considered relative to the average price. For example, winter squash prices in 2019 have the same variance as apple prices in 2019 at \$0.08 per pound, but winter squash prices average \$0.40 per pound versus \$0.27 per pound for apples. So relative to overall value per pound, winter squash is less risky from a price perspective than apples.

As the term implies, skewness measures how the price data is spread out around the average. If the skewness is negative it means there are more price observations below the average than above the average. The more negative the skewness the further those price observations are from the average. Likewise, if the skewness is positive it means there are more observations above the average than below the average. A skewness of 0 means that there are roughly the same number of price observations above and below the average with roughly the same spread from the average price. A large negative skewness tells you that there is a significant chance that observed prices will be below the average. A large positive skewness tells you that there is a significant chance the observed prices will be above the average. When the skewness is either strongly negative or strongly positive it also means that the data is probably not normally distributed.

Finally, the number of observations tells you how many days average price observations were reported. For example, in the case of apples in 2019, there were 29 days on which average prices were reported while in 2020, there were 28 days on which average prices were reported. Generally, the larger the number of observations the more reliable the data is at measuring the statistics for the specialty crop. Statisticians generally prefer to have 30 observations and the statistics from any specialty crops with less than 20 observations should be considered potentially unreliable.

**Price seasonality at the produce auction markets****Specialty Crop Price Seasonality at the Central Missouri Produce Auction**

|                       | Years       | Price Index (First Marketing Month = 100) |     |     |     |     |     |     |     |     |     |     |     |     |
|-----------------------|-------------|-------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                       |             | Included                                  | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Beans, Green (Snap)   | 2019        |                                           |     |     |     |     | 100 | 95  | 90  | 75  | 51  | 50  |     |     |
| Blackberries          | 2019 & 2020 |                                           |     |     |     |     |     | 100 | 72  | 69  |     |     |     |     |
| Corn, Sweet           | 2020        |                                           |     |     |     |     |     | 100 | 84  | 91  | 71  |     |     |     |
| Cucumbers, Regular    | 2019 & 2020 |                                           |     |     |     | 100 | 74  | 41  | 47  | 52  | 54  | 49  |     |     |
| Cucumbers, Seedless   | 2019 & 2020 |                                           |     |     | 100 | 86  | 86  | 58  | 48  |     |     |     |     |     |
| Eggplant              | 2019 & 2020 |                                           |     |     |     |     |     | 100 | 82  | 66  | 45  | 64  |     |     |
| Onions, Sweet         | 2019        |                                           |     |     |     |     |     | 100 | 81  | 90  | 83  | 59  |     |     |
| Peppers, Colored Bell | 2019 & 2020 |                                           |     |     |     |     | 100 | 96  | 65  | 36  | 34  | 25  |     |     |
| Peppers, Green Bell   | 2019 & 2020 |                                           |     |     |     |     | 100 | 81  | 45  | 31  | 30  | 26  |     |     |
| Peppers, Hot          | 2019 & 2020 |                                           |     |     |     |     |     | 100 | 70  | 57  | 45  | 37  |     |     |
| Pumpkins              | 2019 & 2020 |                                           |     |     |     |     |     |     |     | 100 | 72  | 58  |     |     |
| Squash, Yellow        | 2019 & 2020 |                                           |     |     |     |     | 100 | 75  | 73  | 73  | 66  | 64  |     |     |
| Strawberries          | 2020        |                                           |     |     |     |     | 100 | 68  | 59  | 58  | 74  |     |     |     |
| Tomatoes, Heirloom    | 2019 & 2020 |                                           |     |     |     |     |     | 100 | 70  | 63  | 40  | 25  |     |     |
| Tomatoes, Large #1    | 2019        |                                           | 100 | 82  | 76  | 55  | 59  | 34  | 37  | 28  | 42  | 46  |     |     |
| Tomatoes, Medium #1   | 2019        |                                           | 100 | 73  | 69  | 50  | 52  | 28  | 32  | 23  | 36  | 40  |     |     |
| Watermelon, Seeded    | 2019 & 2020 |                                           |     |     |     |     |     | 100 | 61  | 57  |     |     |     |     |
| Watermelon, Seedless  | 2019 & 2020 |                                           |     |     |     |     |     | 100 | 45  | 54  |     |     |     |     |
| Zucchini              | 2019 & 2020 |                                           |     |     |     | 100 | 92  | 49  | 43  | 49  | 38  | 60  |     |     |

The table above shows the seasonality in fruit and vegetable prices at the Central Missouri Produce Auction based on reported data for 2019 and 2020. In this table, actual prices are converted into a price index for each specialty crop comparing each month with the first month where sales occurred. For example, in the case of green beans, the first month with sales was May so the May prices was set as the basis for comparison. For green beans the May index is set at 100. The June price is then measured against the May price. With a value of 95, it indicates that June prices were 95% of the level of May prices. By the end of the season in October, green bean prices have fallen to 50% of the May price level. Note that the first month of sales varies by commodity. In the case of blackberries, June is the first month of sales, so the June index is set at 100 and the other months compared to June for blackberries.

Growers should take away three things from the table:

1. It's best to market the largest portion of your produce early in the season so that you get the highest prices.
2. Some crops experience an increase in prices towards the end of the year because supplies get tighter as you move away from the primary growing period.
3. The typical sales season for each crop at the Central Missouri Produce Auction Market.

Not all crops exhibit strong seasonality patterns and/or do not have enough observations to establish a pattern in the Central Missouri Produce Auction market. Seasonality patterns could not be established for apples, asparagus, beets, blueberries, cabbage, cantaloupe, lettuce, okra, potatoes, sweet potatoes, and

winter squash. It is likely that seasonal patterns vary somewhat across produce auction markets and from year to year, but the underlying pattern of experiencing the highest prices in the early part of the season is pervasive across years and most specialty crops.

Note that COVID-19 appeared to distort the seasonality in some specialty crops in 2020 and 2020 is excluded for those crops. In addition, for some specialty crops, only 2020 included data across a period of months.

### ***Local grocery stores***

The grower perspective:

Growers reported good success in working with local grocery stores and small grocery store chains. They indicated that local grocery stores were more approachable and mentioned Schnucks, Associated Wholesale Growers, Hy-Vee, and others as amenable to working with small growers.

Growers cautioned that it is important to work with both the produce manager as well as the store manager. Some growers noted struggles with competitors (both local and non-local) that would undercut their prices in order to make a sale to the grocery store. They also report that the produce manager would shop suppliers for the lowest price making it difficult to establish a reliable market. Growers also noted that they had not been successful in marketing to chains that are low price or “cost-cutter” type stores.

The produce manager perspective:

In order to get the grocery store perspective on buying produce from local growers, a few local chain grocery stores were also interviewed. Both chain grocery stores indicated that they would buy local produce including lettuce, tomatoes, cucumbers, green bell peppers, sweet corn, zucchini squash, yellow squash, jalapeno peppers, Gala and Jonathan apples, peaches pumpkins, and assorted fall gourds. They usually make local purchases from May through early October although they are open to year-round purchases. In purchasing directly from farmers, they prefer prearranged consistent delivery times and do not want to work with growers that show up at random times with deliveries.

Produce managers indicated that they often made purchases from local produce auctions and wanted produce that was packed in industry standard packaging and weights as well as compliant with food safety guidelines. Some produce managers indicated that their corporate office requires that growers fill out forms related to food safety and other regulations. They also indicated that they could source “local” produce through their regular vendors although the prices were higher. Some grocers commented that they preferred to purchase from the auction markets because it gave them more flexibility in aligning the quantity they purchased with the amount consumers were purchasing.

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**Marketing to Grocery Stores**

| <b>Advantages</b>                                                         | <b>Disadvantages</b>                                                    |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Relatively easy way to expand produce sales                               | Grocery stores pay closer to wholesale prices rather than retail prices |
| They will take a variety of produce, but demands can be unpredictable     | Local grocery stores have specific delivery times that must be met      |
| Less time consuming to market to higher volumes                           | Requires product delivery                                               |
| Growers should “sell” the idea of local produce with local grocery stores | Growers must focus on higher volume markets                             |

***“Easy” value-added products***

Many growers in level 2 were also engaged in the beginning stages of developing “value-added” products. These growers were involved in producing jams, jellies, apple cider, vinegar, elderberry products, and many others. Some growers commented that improvement in food safety regulations that allowed small farmers to open small kitchens could be quite beneficial. Others commented that it might be helpful to have two sets of regulations – one that applied to washing, chopping, and freezing and another set that applied to anything associated with cooking and canning.

Many growers have tried to go to institutional markets such as schools, hospitals, senior living facilities, and prisons. Supplying schools is difficult because it really requires year-round production and often the heaviest season of production are when schools are not in session. Heated high tunnels offer some possibilities for year-round supplies and several growers were able to produce tomatoes through as long as March, with production only absent in April and May. Various types of leaf lettuce, swiss chard, kale, etc. are produced year-round by growers with hoop houses. Over half of that production utilizes hydroponics within hoop buildings.

Another significant issue with supplying institutions is that many items need to be lightly processed. This might include washing, slicing, packaging, labeling, and possibly freezing. Growers indicate this requires meeting additional food safety regulations and a certified kitchen. There are some efforts being coordinated by Extension to get some pilot kitchens started.

**Level 3: high volume markets**

Helping growers move to level 3 markets is critical for the fruit and vegetable industry to grow in Missouri. High volume markets:

- are more complex to manage with more clients,
- require on-farm cooling facilities,

- have more food safety regulations,
- require more paperwork,
- include more stringent production schedule and delivery deadlines,
- will likely require the grower to switch their day-to-day activities to managing the business rather than producing the specialty crop,
- will likely require full traceability with implications for labeling, and
- may possibly require fresh cut processing.

Of all the barriers discussed, the most common issue was uncertainty regarding food safety regulations. Missouri's small growers are aware that additional regulations and paperwork apply as they expand their production. Growers are often very excited about learning new production techniques but view regulations, particularly paperwork and record keeping, as particularly burdensome. They also note that some regulations seem outside their control (such as avoiding contamination from wild animals) putting a random element of risk in their operations. Growers are looking for transparent and realistic regulations with straight forward procedures for compliance. Complying with additional regulations can be a large hurdle for small commercial growers that want to be significantly larger.

In contrast, large commercial operations in California and Florida often have one or more full time "compliance officers" dedicated to ensuring compliance with rules and regulations as well as demands from grocery store chains. Large volume buyers such as Walmart often require food safety audits of their growers that even large operations struggle to stay in compliance with. These audits would make it difficult for small growers to participate with these large buyers.

The changes mentioned above can be significant hurdles for growers. These hurdles can be overcome by developing and aggressively promoting the support systems (infrastructure) to make it easier for growers to jump through these hurdles. One extension agent described the need for "turn-key" grower training where growers go through a 12-week class covering all of these aspects. and in fact, a commercial fruit production series of classes was held by MU Extension over the spring and summer of 2020.

To speed up interest in expanding production, growers need:

- direct examples of points of contact for new markets and/or how to develop these contacts,
- step-by-step instructions on what to expect at different markets,
- detailed knowledge of their costs of production
- step-by-step detailed instructions on how to comply with various food safety regulations,
- boilerplate templates for the forms, standard operating procedures, and compliance logs,
- how to get help if their operation is found to not be in compliance,
- information on how to access more labor with the skills they need,

- information and demonstration of labor-saving equipment,
- knowledge of what traceability is, what it means, and how they can cost effectively achieve it,
- training for food handling as well as training on how to access and use an approved commercial kitchen
- detailed information on how a cooperative might be used as a tool to give them more access to institutional markets and/or fresh markets, and
- access to credit.

There were a few Missouri growers who had pushed through to level 3 markets and their insights are reported below.

### ***Selling through brokers***

Several large Missouri growers discussed how they market their fruits and vegetable through brokers and many of these farms have been in business in excess of 100 years. Large grocery store chains such as Walmart, Kroger, Save-a-lot, etc. often buy their produce through brokers instead of dealing directly with lots of individual growers. The broker's job is to connect the buyers and growers making sure the grower is a reliable source of quality produce. In most cases the broker never even sees the actual produce nor do they assume ownership of the produce. They rely entirely on the grower to deliver a quality product. Brokers quickly lose interest in growers that produce inferior products or insufficient volumes. Brokers may also facilitate transportation of produce from the farm to the retail destination. Brokers are often skeptical of new growers that haven't been producing long and are reluctant to take them on as clients.

Produce marketed through brokers is inspected before it leaves the farm and when it gets to the final destination and the buyers can reject the entire semi-load at either time. Missouri growers indicated that in their experience, loads were typically rejected less than 5% of time, but if they are, the grower is responsible for finding a new customer for their produce. This can be difficult if the rejected load is 500 miles from the grower. Food banks are often a logical delivery point for rejected loads. In these

### **Marketing through Brokers**

| <b>Advantages</b>                                                                        | <b>Disadvantages</b>                                                                                               |
|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| Access to large volume market without producing everything yourself                      | Brokers charge a commission fee                                                                                    |
| Gives the grower access to markets they may otherwise not be able to get into            | Difficult for new growers to get started with a broker                                                             |
| Brokers may be able to secure higher prices with their more detailed knowledge of buyers | Grower must deliver both high volume and high quality                                                              |
| Grower can focus on producing the crop and let the broker worry about marketing the crop | Risk of having produce rejected either at the farmgate or at the destination with the grower bearing all the costs |

situations, the grower then bears not only the cost of producing and harvesting the crop, but also the delivery cost.

### ***Institutional markets***

Missouri growers expressed a strong interest in supplying institutional markets, such as schools and hospitals. Most felt that an intermediary entity would be needed to handle some minor processing such as chopping, washing, packaging, etc. because of the regulatory requirements on food safety. Missouri Extension personnel are already working on some special projects to help growers connect to commercial kitchens fully compliant with food processor requirements in Missouri. Small growers often felt they didn't have the resources to support a commercial kitchen. However, this is an opportunity to develop a food processing cooperative that could purchase from small growers, process their products, and deliver to institutional markets. The institutions get the advantage of having a reliable supplier as well as dealing with a significantly larger supplier than one grower.

One of the largest Missouri produce growers commented that once you get large enough to begin competing in wholesale type markets the competition becomes much more intense. They suggested that in institutional markets such as large school districts, other suppliers from the east or west coasts will reduce their prices to undercut local production. In addition, other suppliers may have access to a variety of suppliers enabling them to deliver products year-round rather than only being able to supply when the product is in season. Suppliers leverage this capability by suggesting they will drop the buyer for the entire year if they are not able to supply them all year long. Some large Missouri growers have found that using a combination of marketing outlets is usually the most reliable. They mentioned using a

### **Marketing to Institutions (schools, hospitals, prisons, etc.)**

| <b>Advantages</b>                                                                      | <b>Disadvantages</b>                                                                                                                          |
|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Access to large volume markets                                                         | Grower must deliver both high volume and high quality                                                                                         |
| Fewer customers to service                                                             | Grower's individual volume may not be high enough to supply the institution                                                                   |
| Regular, consistent demand makes it easier for the grower to plan production expansion | Grower production cycle may not sync well with institutional demand (i.e., school demands often follow cycles opposite of grower production.) |
| Grower can capture economies of scale reducing variable and fixed costs of production  | Institutions often require at least "fresh-cut" processing and the grower may not have access to a certified kitchen to do this processing.   |
|                                                                                        | Requires more food safety paperwork                                                                                                           |
|                                                                                        | Some institutions require one vendor to supply produce all year long                                                                          |

combination of grocery store chains, high end restaurants, and wholesalers to ensure they had access to

adequate markets. They also indicated they were always making new contacts and exploring new potential markets.

### ***Marketing cooperatives***

Missouri has a long history of developing successful cooperatives for other agricultural enterprises. States accounting for the largest share of fruit and vegetable production (California, Florida, Washington) have demonstrated the importance of utilizing cooperatives in fruit and vegetable production. In the case of Missouri, produce auctions are already a form of a marketing cooperative. They serve the function of providing a method for aggregating graded produce for buyers to access.

There are a few private packing houses in Missouri, one of which is Proffer Produce in Park Hills (60 miles south of St. Louis). This packing house has growing and marketing arrangements in Missouri, Arkansas, Illinois, Louisiana, Mississippi, Wisconsin, Michigan, Minnesota, South Carolina, Florida, Tennessee, and Texas. They also import produce from Mexico, the Dominican Republic, and Costa Rica. Establishing a network of cooperatives that would serve as aggregators for produce from Missouri's small fruit and vegetable farms could provide additional markets and allow for significant production expansion.

Given the relatively small size of Missouri fruit and vegetable growers, it would likely be most economical to leverage existing cooperatives such as MFAs and Coops to help carry inputs for fruit and vegetable growers. Some growers mentioned that this was occurring to some extent but other noted that many did not carry items needed for irrigation. With a strong network of specialty crop growers buying the supplies on a regular basis, cooperatives could afford to carry the inventory of inputs needed for specialty crop production.

### **Marketing through Cooperatives**

| <b>Advantages</b>                                                                                       | <b>Disadvantages</b>                                                                                       |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Access to large volume markets                                                                          | Grower must deliver both high volume and high quality                                                      |
| Cooperative manages quality and volume requirements                                                     | Grower may not agree with cooperative's grading of their products                                          |
| Cooperative can negotiate better delivery terms since they are managing production from several growers | The success of the cooperative depends on the grower members delivering the volume and quality of products |
| Grower can capture economies of scale reducing variable and fixed costs of production                   | Growers must give up some of their independence and work collaboratively                                   |
| Cooperative can access produce from other regions/countries to ensure year-round supply to customers    |                                                                                                            |

**Wholesalers**

Wholesalers typically require very large volumes of produce and primarily work through brokers or large packing houses. There are a few Missouri growers that have attempted to work directly with wholesalers. Wholesalers also typically want year-round supplied and have very exacting standards regarding packing, product quality, and delivery standards. Missouri growers may have a window into these markets by emphasizing “locally produced” in their marketing but they will still have to deliver significant volumes. In addition, some wholesalers have sought to diversify their supplies to limit exposure if there is a recall on one supplier’s produce. But this also means that suppliers must have full traceability of their products back to the grower and the grower may need to be able to determine which set of production was affected.

**Marketing directly to Wholesalers**

| <b>Advantages</b>                                                                     | <b>Disadvantages</b>                                                                                                                                                                             |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Access to large volume markets                                                        | Growers must deliver both high volume and high quality                                                                                                                                           |
| No middleman to take a marketing fee                                                  | Wholesalers have exacting standards regarding product packaging, labeling, uniformity, cooling, transportation and delivery and they will reject produce that does not meet their specifications |
| Grower can capture economies of scale reducing variable and fixed costs of production | May require superior quality when supplies are plentiful                                                                                                                                         |
| Grower can capture economies of scale reducing variable and fixed costs of production | Likely require traceability                                                                                                                                                                      |
| Fewer customers to service                                                            | Requires more food safety paperwork                                                                                                                                                              |

**Level 4: very high-volume markets**

In level 4, growers are now large enough that they must move beyond local markets to regional markets, national markets, and sometimes international buyers. There aren’t many growers in this stage in Missouri and, in fact, Missouri has lost more commercial growers than we have gained especially in open field vegetable production.

**Processing markets**

Many Missouri growers expressed an interest in being able to sell to processing markets. Many perceive that they could take excess production unsold in the fresh market to a processor and at least capture some value on the residual production. For around 80 percent of the fruits and vegetables grown, unfortunately this perception is incorrect. In order to produce optimal products in a highly competitive consumer market, processors demand very specific varieties of produce that generate optimal products. In addition, in order to stay in business, processors must have adequate volumes of produce to keep their facility

running. In order to ensure adequate volumes, most processors contract over 90 percent of the production that they need in a given season.

Given the small and scattered nature of Missouri fruit and vegetable growers, commercial scale processing such as the often-discussed tomato processing plant is not a viable option. Commercial scale processors require dense clusters of production that are capable of providing huge volumes over the entire 12-to-16-week season. Interviews with large processors suggest that a plant with competitive economies of scale would require 20,000 acres of processing tomato production within a 20-mile radius of the plant. In total, the 2017 census indicated that Missouri had 543 acres of fresh and processing types. In addition, the price of processing tomatoes is considerably lower than fresh tomatoes. California data suggest processing tomato prices around \$0.04 per pound and California growers struggle to cover all costs at those prices.

What is more likely to be successful in Missouri are smaller processing facilities directed at specific markets (or consumer segments). For example, a simple fresh cut processing facility that served several institutional markets could be successful if they could find enough growers to supply products. Although clusters of growers do exist, the sparse data on fruits and vegetable growers even from the Census of Agriculture makes it difficult to identify the best location to locate a facility. By working with the produce auction markets and Farmers' markets it could be possible to put together the critical volume of products needed. The fresh cut processing facility may have to locate "packing sheds" close to growers so that they can provide cooling and refrigeration. The "packing sheds" could then ship produce to the fresh cut processing facility. The processing facility could be designed to also handle specialty crops with a longer shelf life to allow the facility to operate year-round.

Another option is the production of value-added products. Flash frozen fruits and vegetables have declined in popularity in recent years, but finding niche markets in jellies, jams, and a variety of other possible products could be economically feasible. Under the umbrella of the Mizzou College of Agriculture, Forestry, and Natural Resource's Food, Beverage, and Forestry Manufacturing Initiative, small scale food processing centers with store fronts are envisioned to allow growers interested in pursuing value-added concepts to test their concept before investing in large scale facilities. This approach would help growers limit risk and be more willing to test value-added concepts.

More details on the processing sector can be found in a second report produced in the study entitled, “The Economic Viability of Expanding Fresh and Processed Fruit and Vegetable Production in Missouri – Fruit and Vegetable Processing”.

### ***Missouri Potatoes***

Less perishable products such as potatoes can move long distances to processing markets, even as far as Canada or Mexico. Potatoes are not stored in Missouri due to the hot climate where they are produced. Nearly all of Missouri’s commercial potatoes go to chipping plants. Buyers often directly supply the seed potatoes they want the producer to use. The farms in the Charleston area of Missouri are as large as growers in Washington, Oregon, or Idaho.



April 12, 2019. Romaine lettuce in hydroponic production, Sikeston, MO (Scott County)

### **Marketing to Processors**

| <b>Advantages</b>                                                                                               | <b>Disadvantages</b>                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Access to large volume markets                                                                                  | Growers must deliver high volumes and often specific varieties produced are dictated by the processor                                            |
| No middleman to take a marketing fee                                                                            | Processors still have quality standards to meet and will reject loads of produce if quality is impaired                                          |
| Processors will often contract with growers for specific volumes at a set price helping limit grower price risk | Growers have to be located close to the processing facility in order to limit any degradation in produce quality before it reaches the processor |
| Grower can capture economies of scale reducing variable and fixed costs of production                           | Consumer demand for processed fruits and vegetables has been flat to declining                                                                   |
| Fewer customers to service                                                                                      | Small growers may not be able to access a processor if they have small volumes                                                                   |

### ***Chain Store Distribution***

Large chain stores often will not buy directly from growers but there are exceptions. These stores often want the quality control services their regional distribution centers provide. Increasingly these large chains not only demand large volumes on a regular basis, but they also want a supplier that can deliver products reliably year-round.

Florida Extension personnel note that there is a lot of consolidation occurring in the vegetable sector with fewer and larger vegetable growers. One of the drivers of this consolidation is that big grocery store chains are demanding that growers deliver year-round supplies. The only way that Florida growers have been able to accommodate this request is by having suppliers across multiple states.

Direct sales to larger chains such as Walmart, Kroger, and Save-a-lot are generally handled through a broker. Produce quality, packaging, and labeling are critical when working with chain stores. Many chain stores will also require traceability and may even do their own food safety and handling inspections at the grower's farm.

### **Marketing directly to Large Chain Stores**

| <b>Advantages</b>                                                                         | <b>Disadvantages</b>                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Access to very large volume markets                                                       | Growers must deliver both high volume and high quality                                                                                                                                      |
| Fewer customers to service                                                                | Chains have exacting standards regarding product packaging, labeling, uniformity, cooling, transportation and delivery and they will reject produce that does not meet their specifications |
| No middleman to take a marketing fee                                                      | Difficult to gain access to this market                                                                                                                                                     |
| Grower can capture economies of scale reducing variable and fixed costs of production     | Usually require year-round supply capability                                                                                                                                                |
| Can simplify delivery by channeling all deliveries through a regional distribution center | Require traceability                                                                                                                                                                        |
|                                                                                           | Requires stringent food safety paperwork                                                                                                                                                    |

### ***Terminal Markets***

Historically terminal markets were centrally located hubs where wholesalers, distributors, and brokers were clustered together usually around key transportation hubs including rail and truck. These markets were very important three decades ago and were often the outlet for growers with large volumes of produce. Over the past few decades terminal markets have declined significantly in importance. The USDA's Agricultural Marketing Service (AMS) stopped collecting prices from the Saint Louis terminal market on December 30, 2017 making Chicago the closest terminal market for which AMS still reports prices. As with all produce markets, effective participation requires building strong relations with buyers.

### ***Value Added Opportunities***

Many growers mentioned wanting to pursue value-added opportunities. Their ideas included apple cider, vinegar, jellies, jams, alcohol, cough syrup, infused drinks, etc. Some weren't sure exactly how to start

the process and were concerned about the food safety regulations. Many mentioned reaching out to extension as the first step.

### **Marketing Value Added Products**

| <b>Advantages</b>                                     | <b>Disadvantages</b>                                                                                                      |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Increased shelf life                                  | Products must comply with food safety standards often requiring a specialized kitchen and/or processing facility.         |
| Product is less bulky and fragile to handle           | In some cases, products must pass food safety tests                                                                       |
| Can help utilize unsold produce                       | Requires a marketing plan for how you will distribute and sell your products and an understanding of competitive products |
| May allow labor to be used outside the growing season | Requires more interaction with customers                                                                                  |
| Adds another profit stream to the business            |                                                                                                                           |

### ***Missouri Elderberries***

One of the examples with a lot of potential came from a Missouri elderberry producer. She had coordinated with a local small processor to sell her excess elderberries (those not sold on the fresh market) for manufacture into cough syrup and drinks. With help from the research community, it may be possible that scientific research could verify the potential health benefits of elderberries opening the path for explosive demand growth.

Missouri is the largest producer of elderberries in the United States and production is growing. Improved varieties of elderberries have led to significantly higher yields boosting profitability. The demand for elderberries has also continued to grow especially with the perceived health benefits as an antioxidant, possible antiviral properties, and potential to boost the immune system. The body of scientific evidence supporting the health benefits of elderberries is still small with only a handful of studies on relatively small groups of people. In these small studies, elderberries were found to help people recover more quickly from flu-like symptoms. Larger studies are needed to determine more conclusive results. Elderberries certainly represent a unique Missouri opportunity for a “value-added” product.

"Found" brand elderflower infused sparkling water a "value-added" product of elderberry production.



March 21, 2019. Elderberry field in winter dormancy. Springfield, MO (Greene County)

### ***E-commerce & online marketing***

One of the many side effects of COVID-19 on the fruit and vegetable sector is the growth in direct-to-consumer marketing. Fruit and vegetable growers as well as processors are looking at direct-to-consumer marketing as an opportunity to diversify their customer base. Having multiple ways to reach consumers via retail, foodservice, and direct-to-consumer allows them to manipulate the supply when disruptions such as COVID-19 arise. Cathy Burns, CEO of the Produce Marketing Association, believes that COVID-19 has accelerated the growth of e-commerce with 10 years of growth occurring in just 3 months. In addition, internet technology platforms have now been developed to deliver cost-effective store front solutions directly to the consumer and advanced packaging solutions make shipping fresh produce directly to the consumer possible.

The rapid growth in e-commerce and online marketing was a developing trend prior to COVID-19, but since COVID-19 this trend has rapidly accelerated. According to the trade magazine, "The Packer" 72% of produce industry leaders agree that direct-to-consumer (DTC) sales will continue to expand rapidly.

## Missouri Specialty Crop Cost and Returns Budgets

The United States Department of Agriculture (USDA) does not conduct surveys of specialty crop costs of production like they do for row crops. Nearly all of the specialty cost of production data is reported by various state extension agencies. These budgets are largely based on the expertise of extension personnel and growers across the United States. In the case of Missouri, some budgets existed prior to this study and were primarily focused on the southeast region. Through the grower interviews we attempted to gather cost of production information, particularly the quantity of inputs used. Growers in the southeast region of the state were best able to comment on their specific inputs and costs of production in part due to the larger scale of their operations but also because they often focused on just a few specialty crops. In other regions, the majority of small-scale growers could talk about total costs for their entire operation, but not crop specific costs because they don't break their costs down by crop.

On the recommendation of Missouri's Extension horticulturalists for specialty crops where no previous enterprise budget specific to Missouri existed, a nearby state's budget was utilized as a starting point. These budgets from other states were updated with the latest input costs and 2020 Missouri output prices (based on Central Missouri Auction Prices). The other state budgets utilized in constructing Missouri budgets are listed in the references section of this report.

You can help improve the cost and returns budgets discussed below by sending feedback to [krusej@missouri.edu](mailto:krusej@missouri.edu) or [zimmelp@missouri.edu](mailto:zimmelp@missouri.edu). By reviewing these budgets over time with growers and Extension horticulturalists our goal is to further customize these budgets to Missouri conditions. The latest versions of the budgets are available at: <https://www.fapri.missouri.edu/farmers-corner/specialty-crops/>.

## **Annual Crops**

As you utilize these budgets you should always begin by customizing the budget to your farm. Your operation may have important differences in soil fertility, pests, irrigation, labor, etc. These budgets provide a benchmark from which to start but are really only the beginning of developing sound financial budgets for your operation. While we do not discuss each crop's budget in detail, you are welcome to contact us with questions, corrections, additional details, and comments.

For annual crops, the enterprise budgets present the cost and returns per acre for one year. At the top of each budget, the yield and price of the specialty crop budget is listed. For many of the crops we are using yields from surrounding states because there is no NASS data reported for Missouri. Sales prices are taken from the Central Missouri Produce Auction if they have a representative price for the commodity. In some cases, they do not have the crop or there are too few observations so the Chicago terminal market price is used because it is the closest terminal market where USDA reports prices.

Variable costs are based on the quantity of inputs multiplied by the price. The input quantities are based on surrounding states and prices were cross referenced with price reported by various input suppliers via the internet. Labor rates have been assumed to be \$12.50 per hour for hired labor and \$15.00 per hour for operator labor across all budgets. Marketing costs are generally reported as a percentage of sales. They are based on the specialty commodity but generally average around 10% of sales. These costs are incurred in various ways with the most obvious example being commissions charged by auction markets or brokers. In Farmers' Markets, these costs are reflected in hours spent at the market directly selling to customers as well as promotional materials.

Land costs are based on average rental rates reported in Extension budgets for Missouri. Machinery and irrigation fixed cost are based on reported rates from surrounding states.

At the bottom of each budget, the returns over total costs are reported. These returns are calculated as total revenue less total variable and fixed costs.

**Missouri Bell Peppers Enterprise Budget – Trickle Irrigation, Fresh Market**

|                                    |             |             |                                    | Gross Returns       |
|------------------------------------|-------------|-------------|------------------------------------|---------------------|
|                                    |             |             | Sales Price<br>Dollars Per<br>Unit | Dollars Per<br>Acre |
| Revenues, \$/Acre                  | Yield Units | Yield       |                                    |                     |
| Bell Peppers (1 bu. or 28-30 lbs.) | box         | 1200        | \$17.40                            | \$20,880.00         |
| Total Revenue                      |             |             |                                    | \$20,880.00         |
|                                    |             |             |                                    |                     |
|                                    |             |             | Input Price                        | Cost                |
|                                    |             | Input       | Dollars Per                        | Dollars Per         |
| Costs, \$/Acre                     | Input Units | Quantity    | Unit                               | Acre                |
| Variable Costs                     |             |             |                                    |                     |
| Plants                             | thous.      | 12          | \$180.00                           | \$2,160.00          |
| Fertilizer and Lime                |             |             |                                    |                     |
| Preplant and starter solution      |             |             |                                    |                     |
| Nitrogen                           | lb.         | 30          | \$0.31                             | \$9.30              |
| Phosphate                          | lb.         | 200         | \$0.32                             | \$64.00             |
| Potash                             | lb.         | 175         | \$0.30                             | \$52.50             |
| Lime (spread)                      | ton         | 0.5         | \$23.00                            | \$11.50             |
| Sidedressing or irrigation         |             |             |                                    |                     |
| Nitrogen                           | lb.         | 80          | \$0.31                             | \$24.80             |
| Herbicide                          |             |             |                                    |                     |
| Goal 2XL                           | pt.         | 1.25        | \$8.70                             | \$10.88             |
| Gramoxone Inteon                   | oz.         | 64.00       | \$0.24                             | \$15.36             |
| Insecticide                        |             |             |                                    |                     |
| Orthene 90 S                       | lb.         | 0.670       | \$6.50                             | \$4.36              |
| Radiant 15C                        | oz.         | 8.000       | \$5.70                             | \$45.60             |
| Mustang Max                        | oz.         | 4.000       | \$1.14                             | \$4.56              |
| Other                              | oz.         | 0.000       | \$0.00                             | \$0.00              |
| Fungicide                          |             |             |                                    |                     |
| Kocide 2000                        | lb.         | 4.500       | \$6.66                             | \$29.97             |
| Quadris                            | oz.         | 18.600      | \$1.56                             | \$29.06             |
| Drip Tape                          | roll        | 1.200       | \$59.41                            | \$71.29             |
| Black plastic                      | roll        | 1.8         | \$129.99                           | \$233.98            |
| Packaging                          |             |             |                                    |                     |
| Boxes                              | containers  | 1,200       | \$1.26                             | \$1,512.00          |
| Labor                              |             |             |                                    |                     |
| Operator labor                     | hours       | 7.36        | \$15.00                            | \$110.39            |
| Irrigation labor                   | hours       | 25          | \$15.00                            | \$375.00            |
| Harvest labor                      | hours       | 125         | \$12.50                            | \$1,562.50          |
| Grade/pack labor                   | hours       | 170         | \$12.50                            | \$2,125.00          |
| Plastic disposal labor             | hours       | 18          | \$12.50                            | \$225.00            |
| Other labor                        | hours       | 5           | \$12.50                            | \$62.50             |
| Machinery fuel/repair/maintenance  | acre        | 1           | \$147.08                           | \$147.08            |
| Irrigation fuel and oil            | hour        | 90          | \$0.40                             | \$36.00             |
| Irrigation repairs/maintenance     | acre        | 1           | \$15.00                            | \$15.00             |
| Marketing                          | \$          | \$20,880.00 | 10%                                | \$2,088.00          |
| Miscellaneous expenses             | acre        | 1           | \$10.00                            | \$10.00             |
| Interest on operating capital      | months      | 6           | 6%                                 | \$151.05            |
| Fixed Costs                        |             |             |                                    |                     |
| Land                               | acre        | 1           | \$151.00                           | \$151.00            |
| Machinery                          | acre        | 1           | \$70.09                            | \$70.09             |
| Irrigation system                  | acre        | 1           | \$130.00                           | \$130.00            |
| Total Costs                        |             |             |                                    | \$11,537.76         |
| Returns over Total Costs, \$/Acre  |             |             |                                    | \$9,342.24          |

## Missouri Broccoli Enterprise Budget – Overhead Irrigation, Fresh Market

| Revenues, \$/Acre                 | Yield Units | Yield          | Sales Price      | Gross                    |
|-----------------------------------|-------------|----------------|------------------|--------------------------|
|                                   |             |                | Dollars Per Unit | Returns Dollars Per Acre |
| Broccoli (0.5 bu. box)            | box         | 900            | \$13.39          | \$12,051.00              |
| Total Revenue                     |             |                |                  | \$12,051.00              |
| Costs, \$/Acre                    | Input Units | Input Quantity | Input Price      | Cost                     |
|                                   |             |                | Dollars Per Unit | Dollars Per Acre         |
| Variable Costs                    |             |                |                  |                          |
| Plant (container)                 | thous.      | 17             | \$35.50          | \$603.50                 |
| Fertilizer and Lime               |             |                |                  |                          |
| Preplant and starter solution     |             |                |                  |                          |
| Nitrogen                          | lb.         | 110            | \$0.31           | \$34.10                  |
| Phosphate                         | lb.         | 120            | \$0.32           | \$38.40                  |
| Potash                            | lb.         | 125            | \$0.30           | \$37.50                  |
| Lime (spread)                     | ton         | 0.5            | \$23.00          | \$11.50                  |
| Starter solution                  | cwt.        | 0              | \$68.75          | \$0.00                   |
| Sidedressing or irrigation        |             |                |                  |                          |
| Nitrogen                          | lb.         | 60             | \$0.31           | \$18.60                  |
| Herbicide                         |             |                |                  |                          |
| Treflan 4D                        | pt.         | 1.50           | \$3.22           | \$4.83                   |
| Insecticide                       |             |                |                  |                          |
| Admire Pro                        | oz.         | 8              | \$1.64           | \$13.14                  |
| Radiant 1SC                       | oz.         | 16.000         | \$5.70           | \$91.20                  |
| Avaunt 30 WDG                     | oz.         | 3.000          | \$7.22           | \$21.66                  |
| Fungicide                         |             |                |                  |                          |
| Bravo Weather Stick               | pt.         | 4.500          | \$7.25           | \$32.63                  |
| Packaging                         |             |                |                  |                          |
| Boxes                             | containers  | 900            | \$1.26           | \$1,134.00               |
| Ice and cooling                   | box         | 900            | \$0.25           | \$225.00                 |
| Labor                             |             |                |                  |                          |
| Operator labor                    | hours       | 3.84           | \$15.00          | \$57.53                  |
| Irrigation labor                  | hours       | 2              | \$12.50          | \$25.00                  |
| Harvest labor                     | hours       | 80             | \$12.50          | \$1,000.00               |
| Packing                           | hours       | 35             | \$12.50          | \$437.50                 |
| Other labor                       | hours       | 13             | \$12.50          | \$162.50                 |
| Machinery fuel/repair/maintenance | acre        | 1              | \$201.20         | \$201.20                 |
| Irrigation fuel and oil           | acre-inch   | 4              | \$3.50           | \$14.00                  |
| Irrigation repairs/maintenance    | acre        | 1              | \$10.50          | \$10.50                  |
| Marketing                         | acre        | \$12,051.00    | 10%              | \$1,205.10               |
| Miscellaneous expenses            | acre        | 1              | \$10.00          | \$10.00                  |
| Interest on operating capital     | months      | 6              | 6%               | \$75.65                  |
| Fixed Costs                       |             |                |                  |                          |
| Land                              | acre        | 1              | \$151.00         | \$151.00                 |
| Machinery                         | acre        | 1              | \$114.87         | \$114.87                 |
| Irrigation system                 | acre        | 1              | \$126.50         | \$126.50                 |
| Total Costs                       |             |                |                  | \$5,857.40               |
| Returns over Total Costs, \$/Acre |             |                |                  | \$6,193.60               |

**Missouri Cantaloupe Enterprise Budget – Trickle Irrigation, Fresh Market**

|                                      |             |             |             | Gross       |
|--------------------------------------|-------------|-------------|-------------|-------------|
|                                      |             |             | Sales Price | Returns     |
|                                      |             |             | Dollars Per | Dollars Per |
| Revenues, \$/Acre                    | Yield Units | Yield       | Unit        | Acre        |
| Cantaloupe                           | each        | 4800        | \$2.24      | \$10,752.00 |
| Total Revenue                        |             |             |             | \$10,752.00 |
|                                      |             |             |             | Cost        |
|                                      |             | Input       | Input Price | Cost        |
| Costs, \$/Acre                       | Input Units | Quantity    | Dollars Per | Dollars Per |
|                                      |             |             | Unit        | Acre        |
| Variable Costs                       |             |             |             |             |
| Plants                               | thous.      | 3.6         | \$165.00    | \$594.00    |
| Fertilizer and Lime                  |             |             |             |             |
| Preplant and starter solution        |             |             |             |             |
| Nitrogen                             | lb.         | 50          | \$0.31      | \$15.50     |
| Phosphate                            | lb.         | 125         | \$0.32      | \$40.00     |
| Potash                               | lb.         | 100         | \$0.30      | \$30.00     |
| Lime (spread)                        | ton         | 0.5         | \$23.00     | \$11.50     |
| Sidedressing or irrigation           |             |             |             |             |
| Nitrogen                             | lb.         | 45          | \$0.31      | \$13.95     |
| Herbicide                            |             |             |             |             |
| Strategy                             | pt.         | 2.00        | \$12.30     | \$24.60     |
| Insecticide                          |             |             |             |             |
| Assail 30 SG                         | oz.         | 4           | \$5.76      | \$23.04     |
| Brigade 2EC                          | oz.         | 12.000      | \$0.17      | \$2.04      |
| Fungicide                            |             |             |             |             |
| Bravo Weather Stick                  | pt.         | 5.000       | \$7.25      | \$36.25     |
| Quadris                              | oz.         | 22.000      | \$1.56      | \$34.32     |
| Pollination                          | hive        | 1           | \$75.00     | \$75.00     |
| Drip Tape                            | roll        | 1.2         | \$59.41     | \$71.29     |
| Black plastic                        | roll        | 1.8         | \$129.99    | \$233.98    |
| Packaging                            |             |             |             |             |
| Bins                                 | item        | 48          | \$11.00     | \$528.00    |
| Labor                                |             |             |             |             |
| Operator labor                       | hours       | 6.51        | \$15.00     | \$97.65     |
| Irrigation labor                     | hours       | 7           | \$12.50     | \$87.50     |
| Harvest labor (harvesting & grading) | hours       | 52          | \$12.50     | \$650.00    |
| Plastic disposal labor               | hours       | 18          | \$12.50     | \$225.00    |
| Other labor                          | hours       | 20          | \$12.50     | \$250.00    |
| Machinery fuel/repair/maintenance    | acre        | 1           | \$296.57    | \$296.57    |
| Irrigation fuel and oil              | hours       | 28          | \$1.25      | \$35.00     |
| Irrigation repairs/maintenance       | acre        | 1           | \$15.00     | \$15.00     |
| Marketing                            | acre        | \$10,752.00 | 10%         | \$1,075.20  |
| Miscellaneous expenses               | acre        | 1           | \$10.00     | \$10.00     |
| Interest on operating capital        | months      | 6           | 6%          | \$75.76     |
| Fixed Costs                          |             |             |             |             |
| Land                                 | acre        | 1           | \$151.00    | \$151.00    |
| Machinery                            | acre        | 1           | \$165.48    | \$165.48    |
| Irrigation system                    | acre        | 1           | \$130.00    | \$130.00    |
| Total Costs                          |             |             |             | \$4,997.63  |
| Returns over Total Costs, \$/Acre    |             |             |             | \$5,754.37  |

**Missouri Carrots Enterprise Budget – Irrigated, Fresh Market**

|                                        |             |          |             | Gross       |
|----------------------------------------|-------------|----------|-------------|-------------|
|                                        |             |          | Sales Price | Returns     |
|                                        |             |          | Dollars Per | Dollars Per |
| Revenues, \$/Acre                      | Yield Units | Yield    | Unit        | Acre        |
| Carrots (50 lb. bags)                  | 50 lb. bags | 750      | \$13.50     | \$10,125.00 |
| Total Revenue                          |             |          |             | \$10,125.00 |
|                                        |             | Input    | Input Price | Cost        |
|                                        |             | Quantity | Dollars Per | Dollars Per |
| Costs, \$/Acre                         | Input Units |          | Unit        | Acre        |
| Variable Costs                         |             |          |             |             |
| Seeds                                  | acre        | 1        | \$500.00    | \$500.00    |
| Fertilizer and Lime                    |             |          |             |             |
| Preplant and starter solution          |             |          |             |             |
| Nitrogen                               | lb.         | 0        | \$0.31      | \$0.00      |
| Phosphate                              | lb.         | 0        | \$0.32      | \$0.00      |
| Potash                                 | lb.         | 0        | \$0.30      | \$0.00      |
| Lime (spread)                          | ton         | 1        | \$30.00     | \$30.00     |
| Fertilizer                             | acre        | 1        | \$520.00    | \$520.00    |
| Sidedressing or irrigation             |             |          |             |             |
| Nitrogen                               | lb.         | 0        | \$0.31      | \$0.00      |
| Herbicide                              |             |          |             |             |
| Other                                  | acre        | 3.00     | \$94.30     | \$282.90    |
| Insecticide                            |             |          |             |             |
| Other                                  | acre        | 3.000    | \$54.00     | \$162.00    |
| Fungicide                              |             |          |             |             |
| Other                                  | acre        | 10.000   | \$30.00     | \$300.00    |
| Packaging                              |             |          |             |             |
| Bags                                   | bags        | 750      | \$1.00      | \$750.00    |
| Fumigants                              | acre        | 1        | \$225.00    | \$225.00    |
| Labor                                  |             |          |             |             |
| Operator labor                         | hours       | 8.00     | \$15.00     | \$120.00    |
| Harvest labor                          | hours       | 71.25    | \$12.50     | \$890.63    |
| Grading & Packing                      | hours       | 89.08    | \$12.50     | \$1,113.50  |
| Other labor                            | hours       | 0        | \$12.50     | \$0.00      |
| Machinery fuel/repair/maintenance      | acre        | 1        | \$15.00     | \$15.00     |
| Irrigation                             | acre        | 1        | \$99.85     | \$99.85     |
| Broker's commission                    | bags        | 4453.13  | 10%         | \$445.31    |
| Miscellaneous expenses                 | bags        | 712.5    | \$3.00      | \$2,137.50  |
| (Lines, baggers, coolers, broker fees) |             |          |             |             |
| Interest on operating capital          | months      | 6        | 6%          | \$147.52    |
| Fixed Costs                            |             |          |             |             |
| Land                                   | acre        | 1        | \$151.00    | \$151.00    |
| Machinery                              | acre        | 1        | \$114.87    | \$114.87    |
| Irrigation system                      | acre        | 1        | \$126.50    | \$126.50    |
| Total Costs                            |             |          |             | \$8,131.58  |
| Returns over Total Costs, \$/Acre      |             |          |             | \$1,993.42  |

Data Source: University of Georgia 2020 Carrots Irrigated Budget.

**Missouri Cucumber Enterprise Budget – Trickle Irrigation, Fresh Market**

| Revenues, \$/Acre                 | Yield Units | Yield          | Sales Price | Gross            |
|-----------------------------------|-------------|----------------|-------------|------------------|
|                                   |             |                | Dollars Per | Returns          |
|                                   |             |                | Unit        | Dollars Per Acre |
| Cucumbers (.5 bu or 25 lb. box)   | box         | 1000           | \$15.85     | \$15,850.00      |
| Total Revenue                     |             |                |             | \$15,850.00      |
| Costs, \$/Acre                    | Input Units | Input Quantity | Input Price | Cost             |
|                                   |             |                | Dollars Per | Dollars Per      |
|                                   |             |                | Unit        | Acre             |
| Variable Costs                    |             |                |             |                  |
| Seed                              | lb.         | 2              | \$42.95     | \$85.90          |
| Fertilizer and Lime               |             |                |             |                  |
| Preplant and starter solution     |             |                |             |                  |
| Nitrogen                          | lb.         | 50             | \$0.31      | \$15.50          |
| Phosphate                         | lb.         | 100            | \$0.32      | \$32.00          |
| Potash                            | lb.         | 170            | \$0.30      | \$51.00          |
| Lime (spread)                     | ton         | 0.5            | \$23.00     | \$11.50          |
| Starter solution                  | cwt.        | 0              | \$68.75     | \$0.00           |
| Sidedressing or irrigation        |             |                |             |                  |
| Nitrogen                          | lb.         | 45             | \$0.31      | \$13.95          |
| Herbicide                         |             |                |             |                  |
| Sandea                            | oz.         | 0.50           | \$36.00     | \$18.00          |
| Select 2EC                        | oz.         | 6.00           | \$0.66      | \$3.96           |
| Insecticide                       |             |                |             |                  |
| Admire Pro                        | oz.         | 8              | \$1.64      | \$13.12          |
| Mustang Max                       | oz.         | 12.000         | \$1.14      | \$13.68          |
| Fungicide                         |             |                |             |                  |
| Bravo Weather Stick               | pt.         | 6.000          | \$7.25      | \$43.50          |
| Pollination                       | hive        | 1              | \$75.00     | \$75.00          |
| Drip Tape                         | roll        | 1.5            | \$59.41     | \$89.12          |
| Black plastic                     | roll        | 2.2            | \$129.99    | \$285.98         |
| Packaging                         |             |                |             |                  |
| Boxes                             | item        | 1,000          | \$1.26      | \$1,260.00       |
| Labor                             |             |                |             |                  |
| Operator labor                    | hours       | 6.87           | \$15.00     | \$103.04         |
| Irrigation labor                  | hours       | 8              | \$12.50     | \$100.00         |
| Harvest labor                     | hours       | 70             | \$12.50     | \$875.00         |
| Wash/grade/pick labor             | hours       | 80             | \$12.50     | \$1,000.00       |
| Plastic disposal labor            | hours       | 18             | \$12.50     | \$225.00         |
| Other labor                       | hours       | 5              | \$12.50     | \$62.50          |
| Machinery fuel/repair/maintenance | acre        | 1              | \$272.17    | \$272.17         |
| Irrigation fuel and oil           | hours       | 90             | \$0.40      | \$36.00          |
| Irrigation repairs/maintenance    | acre        | 1              | \$15.00     | \$15.00          |
| Marketing                         | acre        | \$15,850.00    | 10%         | \$1,585.00       |
| Miscellaneous expenses            | acre        | 1              | \$10.00     | \$10.00          |
| Interest on operating capital     | months      | 6              | 6%          | \$78.33          |
| Fixed Costs                       |             |                |             |                  |
| Land                              | acre        | 1              | \$151.00    | \$151.00         |
| Machinery                         | acre        | 1              | \$148.03    | \$148.03         |
| Irrigation system                 | acre        | 1              | \$130.00    | \$130.00         |
| Total Costs                       |             |                |             | \$6,803.27       |
| Returns over Total Costs, \$/Acre |             |                |             | \$9,046.73       |

**Missouri Eggplant Enterprise Budget – Irrigated, Fresh Market**

|                                          |              |          |             | Gross       |
|------------------------------------------|--------------|----------|-------------|-------------|
|                                          |              |          | Sales Price | Returns     |
|                                          |              |          | Dollars Per | Dollars Per |
| Revenues, \$/Acre                        | Yield Units  | Yield    | Unit        | Acre        |
| Eggplant (33 lb. boxes)                  | 33 lb. boxes | 1,200    | \$8.25      | \$9,900.00  |
| Total Revenue                            |              |          |             | \$9,900.00  |
|                                          |              |          |             |             |
|                                          |              |          | Input Price | Cost        |
|                                          |              | Input    | Dollars Per | Dollars Per |
| Costs, \$/Acre                           | Input Units  | Quantity | Unit        | Acre        |
| Variable Costs                           |              |          |             |             |
| Plants                                   | thousand     | 6        | \$100.00    | \$600.00    |
| Fertilizer and Lime                      |              |          |             |             |
| Preplant and starter solution            |              |          |             |             |
| Nitrogen                                 | lb.          | 150      | \$0.31      | \$46.50     |
| Phosphate                                | lb.          | 80       | \$0.32      | \$25.60     |
| Potash                                   | lb.          | 120      | \$0.30      | \$36.00     |
| Lime (spread)                            | ton          | 1        | \$30.00     | \$30.00     |
| Starter solution                         | cwt.         | 0        | \$68.75     | \$0.00      |
| Sidedressing or irrigation               |              |          |             |             |
| Nitrogen                                 | lb.          | 30       | \$0.31      | \$9.30      |
| Herbicide                                |              |          |             |             |
| Other                                    | acre         | 3.00     | \$32.00     | \$96.00     |
| Insecticide                              |              |          |             |             |
| Other                                    | acre         | 6.000    | \$120.00    | \$720.00    |
| Fungicide                                |              |          |             |             |
| Other                                    | acre         | 10.000   | \$10.00     | \$100.00    |
| Black plastic                            | roll         | 0.0      | \$129.99    | \$0.00      |
| Plastic Removal                          | acre         | 1.0      | \$85.00     | \$85.00     |
| Stakes & strings                         | acre         | 1.0      | \$100.00    | \$100.00    |
| Packaging                                |              |          |             |             |
| Boxes                                    | boxes        | 1,200    | \$1.50      | \$1,800.00  |
| Fumigants                                | acre         | 1        | \$225.00    | \$225.00    |
| Labor                                    |              |          |             |             |
| Operator labor                           | hours        | 15.00    | \$15.00     | \$225.00    |
| Harvest & Packing                        | hours        | 285      | \$12.50     | \$3,562.50  |
| Machinery fuel/repair/maintenance        | acre         | 1        | \$75.00     | \$75.00     |
| Irrigation                               | acre         | 1        | \$99.85     | \$99.85     |
| Bee hive                                 | acre         | 1        | \$75.00     | \$75.00     |
| Scouting                                 | acre         | 1        | \$25.00     | \$25.00     |
| Broker fees                              | \$           | 1128.6   | 8%          | \$84.65     |
| Miscellaneous expenses (Harvest Hauling) | loads        | 20       | \$3.00      | \$60.00     |
| Interest on operating capital            | months       | 6        | 6%          | \$126.25    |
| Fixed Costs                              |              |          |             |             |
| Land                                     | acre         | 1        | \$151.00    | \$151.00    |
| Machinery                                | acre         | 1        | \$114.87    | \$114.87    |
| Irrigation system                        | acre         | 1        | \$126.50    | \$126.50    |
| Total Costs                              |              |          |             | \$8,599.01  |
| Returns over Total Costs, \$/Acre        |              |          |             | \$1,300.99  |

Data Source: University of Georgia 2020 Eggplant Irrigated Budget.

**Missouri Garlic Enterprise Budget – Irrigated, Fresh Market**

|                                   |             |             |             | Gross       |
|-----------------------------------|-------------|-------------|-------------|-------------|
|                                   |             |             | Sales Price | Returns     |
|                                   |             |             | Dollars Per | Dollars Per |
| Revenues, \$/Acre                 | Yield Units | Yield       | Unit        | Acre        |
| Garlic                            | lb.         | 6,000       | \$2.38      | \$14,280.00 |
| Total Revenue                     |             |             |             | \$14,280.00 |
|                                   |             |             |             |             |
|                                   |             |             | Input Price | Cost        |
|                                   |             | Input       | Dollars Per | Dollars Per |
| Costs, \$/Acre                    | Input Units | Quantity    | Unit        | Acre        |
| Variable Costs                    |             |             |             |             |
| Garlic Bulbs                      | lb.         | 1000        | \$7.50      | \$7,500.00  |
| Fertilizer and Lime               |             |             |             |             |
| Preplant and starter solution     |             |             |             |             |
| Nitrogen                          | lb.         | 75          | \$0.31      | \$23.25     |
| Phosphate                         | lb.         | 138         | \$0.32      | \$44.16     |
| Potash                            | lb.         | 138         | \$0.30      | \$41.40     |
| Lime (spread)                     | ton         | 0.5         | \$30.00     | \$15.00     |
| Starter solution                  | cwt.        | 0           | \$68.75     | \$0.00      |
| Sidedressing or irrigation        |             |             |             |             |
| Nitrogen                          | lb.         | 0           | \$0.31      | \$0.00      |
| Herbicide                         |             |             |             |             |
| Other                             | acre        | 1.00        | \$108.80    | \$108.80    |
| Insecticide                       |             |             |             |             |
| Other                             | acre        | 0.000       | \$29.85     | \$0.00      |
| Fungicide                         |             |             |             |             |
| Other                             | acre        | 0.000       | \$264.06    | \$0.00      |
| Plastic Mulch/Drip Tape           | ft.         | 10890.0     | \$0.06      | \$653.40    |
| Packaging                         |             |             |             |             |
| Bags                              | bags        | 2,000       | \$0.40      | \$800.00    |
| Labor                             |             |             |             |             |
| Operator labor                    | hours       | 24.90       | \$15.00     | \$373.50    |
| Harvest                           | hours       | 165.00      | \$12.50     | \$2,062.50  |
| Machinery fuel/repair/maintenance | acre        | 1           | \$162.66    | \$162.66    |
| Irrigation                        | acre        | 0           | \$50.00     | \$0.00      |
| Irrigation repairs/maintenance    | acre        | 0           | \$10.50     | \$0.00      |
| Marketing (12% of gross sales)    | \$          | \$14,280.00 | 12%         | \$1,713.60  |
| Miscellaneous expenses            | acre        | 0           | \$3.00      | \$0.00      |
| Interest on operating capital     | months      | 6           | 6%          | \$291.67    |
| Fixed Costs                       |             |             |             |             |
| Land                              | acre        | 1           | \$151.00    | \$151.00    |
| Machinery                         | acre        | 1           | \$114.87    | \$114.87    |
| Irrigation system                 | acre        | 1           | \$126.50    | \$126.50    |
| Total Costs                       |             |             |             | \$14,182.31 |
| Returns over Total Costs, \$/Acre |             |             |             | \$97.69     |

Data Source: Penn State University Small Garlic Production Budget.

**Missouri Green (Snap) Beans Enterprise Budget – Irrigated, Fresh Market**

|                                          |             |                   | Sales Price<br>Dollars Per<br>Unit | Gross<br>Returns<br>Dollars Per<br>Acre |
|------------------------------------------|-------------|-------------------|------------------------------------|-----------------------------------------|
| <b>Revenues, \$/Acre</b>                 | Yield Units | Yield             |                                    |                                         |
| Green Beans (bushel)                     | bu.         | 180               | \$21.50                            | \$3,870.00                              |
| <b>Total Revenue</b>                     |             |                   |                                    | <b>\$3,870.00</b>                       |
|                                          |             |                   | Input Price<br>Dollars Per<br>Unit | Cost<br>Dollars Per<br>Acre             |
| <b>Costs, \$/Acre</b>                    | Input Units | Input<br>Quantity |                                    |                                         |
| <b>Variable Costs</b>                    |             |                   |                                    |                                         |
| Seeds                                    | lbs.        | 60                | \$3.50                             | \$210.00                                |
| <i>Fertilizer and Lime</i>               |             |                   |                                    |                                         |
| <i>Preplant and starter solution</i>     |             |                   |                                    |                                         |
| Lime (spread)                            | ton         | 0.5               | \$30.00                            | \$15.00                                 |
| Fertilizer (5-10-15)                     | lbs.        | 6                 | \$17.00                            | \$102.00                                |
| <i>Sidedressing or irrigation</i>        |             |                   |                                    |                                         |
| Nitrogen                                 | lb.         | 60                | \$0.31                             | \$18.60                                 |
| <i>Herbicide</i>                         |             |                   |                                    |                                         |
| Other                                    | acre        | 3.00              | \$5.00                             | \$15.00                                 |
| <i>Insecticide</i>                       |             |                   |                                    |                                         |
| Other                                    | acre        | 6.000             | \$15.00                            | \$90.00                                 |
| <i>Fungicide</i>                         |             |                   |                                    |                                         |
| Other                                    | acre        | 6.000             | \$25.00                            | \$150.00                                |
| <i>Nematicide</i>                        |             |                   |                                    |                                         |
| Other                                    | acre        | 1.000             | \$42.00                            | \$42.00                                 |
| <i>Packaging</i>                         |             |                   |                                    |                                         |
| Container                                | container   | 180               | \$0.40                             | \$72.00                                 |
| <i>Labor</i>                             |             |                   |                                    |                                         |
| Operator labor                           | hours       | 12.00             | \$15.00                            | \$180.00                                |
| Harvest & Hauling                        | hours       | 29.925            | \$12.50                            | \$374.06                                |
| Shelling, Packing & Cooling              | hours       | 68.4              | \$12.50                            | \$855.00                                |
| Machinery fuel/repair/maintenance        | acre        | 1                 | \$75.00                            | \$75.00                                 |
| Irrigation                               | acre        | 1                 | \$218.51                           | \$218.51                                |
| Repair & Maintenance                     | acre        | 1                 | \$25.00                            | \$25.00                                 |
| Marketing (Sales commission 7%)          | bu.         | \$3,870.00        | 7%                                 | \$270.90                                |
| Interest on operating capital            | months      | 6                 | 6%                                 | \$62.04                                 |
| <b>Fixed Costs</b>                       |             |                   |                                    |                                         |
| Land                                     | acre        | 1                 | \$151.00                           | \$151.00                                |
| Machinery                                | acre        | 1                 | \$114.87                           | \$114.87                                |
| Irrigation system                        | acre        | 1                 | \$126.50                           | \$126.50                                |
| <b>Total Costs</b>                       |             |                   |                                    | <b>\$3,167.49</b>                       |
| <b>Returns over Total Costs, \$/Acre</b> |             |                   |                                    | <b>\$702.51</b>                         |

Data Source: University of Georgia 2020 Snap Beans Budget.

**Missouri Leafy Greens Enterprise Budget – Overhead Irrigation, Fresh Market**

| Revenues, \$/Acre                 | Yield Units | Yield          | Sales Price | Gross            |
|-----------------------------------|-------------|----------------|-------------|------------------|
|                                   |             |                | Dollars Per | Returns          |
|                                   |             |                | Unit        | Dollars Per Acre |
| Leafy greens (0.5 bu.)            | box         | 1300           | \$9.29      | \$12,077.00      |
| Total Revenue                     |             |                |             | \$12,077.00      |
| Costs, \$/Acre                    | Input Units | Input Quantity | Input Price | Cost             |
|                                   |             |                | Dollars Per | Dollars Per      |
|                                   |             |                | Unit        | Acre             |
| Variable Costs                    |             |                |             |                  |
| Seed                              | lb.         | 16             | \$7.23      | \$115.68         |
| Fertilizer and Lime               |             |                |             |                  |
| Preplant and starter solution     |             |                |             |                  |
| Nitrogen                          | lb.         | 50             | \$0.31      | \$15.50          |
| Phosphate                         | lb.         | 120            | \$0.32      | \$38.40          |
| Potash                            | lb.         | 125            | \$0.30      | \$37.50          |
| Lime (spread)                     | ton         | 0.5            | \$23.00     | \$11.50          |
| Starter solution                  | cwt.        | 0              | \$68.75     | \$0.00           |
| Sidedressing or irrigation        |             |                |             |                  |
| Nitrogen                          | lb.         | 40             | \$0.31      | \$12.40          |
| Herbicide                         |             |                |             |                  |
| Glyphosate                        | pt.         | 2.00           | \$2.00      | \$4.00           |
| Stinger                           | oz.         | 4.00           | \$2.65      | \$10.60          |
| Poast 1.5E                        | pt.         | 1.00           | \$13.44     | \$13.44          |
| Insecticide                       |             |                |             |                  |
| Admire Pro                        | oz.         | 8              | \$1.64      | \$13.14          |
| Radiant 1SC                       | oz.         | 16.000         | \$5.70      | \$91.20          |
| Avaunt                            | oz.         | 3.000          | \$7.22      | \$21.66          |
| Fungicide                         |             |                |             |                  |
| Quadris                           | oz.         | 15.000         | \$1.56      | \$23.43          |
| Other                             | oz.         | 0.000          | \$0.00      | \$0.00           |
| Packaging                         |             |                |             |                  |
| Boxes                             | containers  | 1,300          | \$1.26      | \$1,638.00       |
| Ice and cooling                   | box         | 1,300          | \$0.25      | \$325.00         |
| Labor                             |             |                |             |                  |
| Operator labor                    | hours       | 3.41           | \$15.00     | \$51.18          |
| Irrigation labor                  | hours       | 4              | \$12.50     | \$50.00          |
| Harvest labor                     | hours       | 120            | \$12.50     | \$1,500.00       |
| Packing                           | hours       | 90             | \$12.50     | \$1,125.00       |
| Other labor                       | hours       | 30             | \$12.50     | \$375.00         |
| Machinery fuel/repair/maintenance | acre        | 1              | \$160.11    | \$160.11         |
| Irrigation fuel and oil           | acre-inch   | 4              | \$4.00      | \$16.00          |
| Irrigation repairs/maintenance    | acre        | 1              | \$10.50     | \$10.50          |
| Marketing                         | acre        | \$12,077.00    | 10%         | \$1,207.70       |
| Miscellaneous expenses            | acre        | 1              | \$10.00     | \$10.00          |
| Interest on operating capital     | months      | 3              | 6%          | \$45.66          |
| Fixed Costs                       |             |                |             |                  |
| Land                              | acre        | 1              | \$151.00    | \$151.00         |
| Machinery                         | acre        | 1              | \$88.95     | \$88.95          |
| Irrigation system                 | acre        | 1              | \$126.50    | \$126.50         |
| Total Costs                       |             |                |             | \$7,289.05       |
| Returns over Total Costs, \$/Acre |             |                |             | \$4,787.95       |

**Missouri Okra Enterprise Budget – Irrigated, Fresh Market**

|                                          |              |                   | Sales Price<br>Dollars Per<br>Unit | Gross<br>Returns<br>Dollars Per<br>Acre |
|------------------------------------------|--------------|-------------------|------------------------------------|-----------------------------------------|
| <b>Revenues, \$/Acre</b>                 | Yield Units  | Yield             |                                    |                                         |
| Okra (15 lb. boxes)                      | 15 lb. boxes | 600               | \$15.00                            | \$9,000.00                              |
| <b>Total Revenue</b>                     |              |                   |                                    | <b>\$9,000.00</b>                       |
|                                          |              |                   | Input Price<br>Dollars Per<br>Unit | Cost<br>Dollars Per<br>Acre             |
| <b>Costs, \$/Acre</b>                    | Input Units  | Input<br>Quantity |                                    |                                         |
| <b>Variable Costs</b>                    |              |                   |                                    |                                         |
| Seed                                     | lb.          | 10                | \$10.00                            | \$100.00                                |
| Transplant Production Costs              | plants       | 10890             | \$0.10                             | \$1,089.00                              |
| <i>Fertilizer and Lime</i>               |              |                   |                                    |                                         |
| <u>Preplant and starter solution</u>     |              |                   |                                    |                                         |
| Nitrogen                                 | lb.          | 100               | \$0.31                             | \$31.00                                 |
| Potash                                   | lb.          | 50                | \$0.30                             | \$15.00                                 |
| <u>Sidedressing or irrigation</u>        |              |                   |                                    |                                         |
| Nitrogen                                 | lb.          | 80                | \$0.31                             | \$24.80                                 |
| <i>Herbicide</i>                         |              |                   |                                    |                                         |
| Other                                    | acre         | 1.00              | \$5.70                             | \$5.70                                  |
| <i>Insecticide</i>                       |              |                   |                                    |                                         |
| Other                                    | acre         | 1.000             | \$10.84                            | \$10.84                                 |
| <i>Fungicide</i>                         |              |                   |                                    |                                         |
| Other                                    | acre         | 1.000             | \$104.00                           | \$104.00                                |
| Plastic Mulch                            | acre         | 1.0               | \$286.00                           | \$286.00                                |
| Plastic Disposal                         | hours        | 18.0              | \$12.50                            | \$225.00                                |
| Drip Lines & Irrigation Fittings         | acre         | 1.0               | \$390.00                           | \$390.00                                |
| <i>Packaging</i>                         |              |                   |                                    |                                         |
| Boxes                                    | boxes        | 600               | \$1.05                             | \$630.00                                |
| <i>Labor</i>                             |              |                   |                                    |                                         |
| Operator labor                           | hours        | 10.00             | \$15.00                            | \$150.00                                |
| Harvest, Grade, & Packing                | hours        | 255               | \$12.50                            | \$3,187.50                              |
| Machinery fuel/repair/maintenance        | acre         | 1                 | \$34.82                            | \$34.82                                 |
| Irrigation                               | acre         | 1                 | \$50.00                            | \$50.00                                 |
| Marketing (10% of gross sales)           | \$           | \$9,000.00        | 10%                                | \$900.00                                |
| Interest on operating capital            | months       | 6                 | 6%                                 | \$94.38                                 |
| <b>Fixed Costs</b>                       |              |                   |                                    |                                         |
| Land                                     | acre         | 1                 | \$151.00                           | \$151.00                                |
| Machinery                                | acre         | 1                 | \$114.87                           | \$114.87                                |
| Irrigation system                        | acre         | 1                 | \$126.50                           | \$126.50                                |
| <b>Total Costs</b>                       |              |                   |                                    | <b>\$7,720.41</b>                       |
| <b>Returns over Total Costs, \$/Acre</b> |              |                   |                                    | <b>\$1,279.59</b>                       |

Data Source: University of Kentucky 2017 Vegetable and Melon Budgets (Large-scale).

**Missouri Onions Enterprise Budget – Irrigated, Fresh Market**

|                                            |             |                | Sales Price | Gross            |
|--------------------------------------------|-------------|----------------|-------------|------------------|
|                                            |             |                | Dollars Per | Returns          |
| <b>Revenues, \$/Acre</b>                   | Yield Units | Yield          | Unit        | Dollars Per Acre |
| Onions (40 lb boxes)                       | 40 lb boxes | 700            | \$12.00     | \$8,400.00       |
| <b>Total Revenue</b>                       |             |                |             | \$8,400.00       |
|                                            |             |                | Input Price | Cost             |
|                                            |             |                | Dollars Per | Dollars Per      |
| <b>Costs, \$/Acre</b>                      | Input Units | Input Quantity | Unit        | Acre             |
| <b>Variable Costs</b>                      |             |                |             |                  |
| Plants                                     | Thou.       | 85             | \$6.50      | \$552.50         |
| <i>Fertilizer and Lime</i>                 |             |                |             |                  |
| <i>Preplant and starter solution</i>       |             |                |             |                  |
| Lime (spread)                              | ton         | 0.33           | \$30.00     | \$9.90           |
| Fertilizer (complete)                      | ton         | 0.7            | \$345.00    | \$241.50         |
| <i>Sidedressing or irrigation</i>          |             |                |             |                  |
| Cal Nitrate                                | ton         | 0.2            | \$375.00    | \$75.00          |
| <i>Herbicide</i>                           |             |                |             |                  |
| Other                                      | acre        | 1.00           | \$30.00     | \$30.00          |
| <i>Insecticide</i>                         |             |                |             |                  |
| Other                                      | acre        | 1.000          | \$321.00    | \$321.00         |
| <i>Fungicide</i>                           |             |                |             |                  |
| Other                                      | acre        | 1.000          | \$300.00    | \$300.00         |
| <i>Packaging</i>                           |             |                |             |                  |
| Labeled mesh bags                          | each        | 100            | \$0.48      | \$48.00          |
| Cartons                                    | each        | 700            | \$1.25      | \$875.00         |
| <i>Labor</i>                               |             |                |             |                  |
| Operator labor                             | hours       | 50.00          | \$15.00     | \$750.00         |
| Harvest                                    | hours       | 99.8           | \$12.50     | \$1,247.50       |
| Grading                                    | hours       | 99.75          | \$12.50     | \$1,246.88       |
| <i>Machinery fuel/repair/maintenance</i>   | acre        | 1              | \$50.00     | \$50.00          |
| <i>Irrigation</i>                          | acre        | 1              | \$71.20     | \$71.20          |
| <i>Drying</i>                              | each        | 700            | 10%         | \$70.00          |
| <i>Miscellaneous expenses (Set plants)</i> | acre        | 1              | \$450.00    | \$450.00         |
| <i>Interest on operating capital</i>       | months      | 6              | 6%          | \$150.63         |
| <b>Fixed Costs</b>                         |             |                |             |                  |
| Land                                       | acre        | 1              | \$151.00    | \$151.00         |
| Machinery                                  | acre        | 1              | \$114.87    | \$114.87         |
| Irrigation system                          | acre        | 1              | \$126.50    | \$126.50         |
| <b>Total Costs</b>                         |             |                |             | \$6,881.47       |
| <b>Returns over Total Costs, \$/Acre</b>   |             |                |             | \$1,518.53       |

Data Source: University of Georgia 2020 Onion Budget.

**Missouri Potatoes Enterprise Budget – Irrigated, Fresh Market**

|                                          |             |                | Sales Price | Gross            |
|------------------------------------------|-------------|----------------|-------------|------------------|
|                                          |             |                | Dollars Per | Returns          |
| <b>Revenues, \$/Acre</b>                 | Yield Units | Yield          | Unit        | Dollars Per Acre |
| Potatoes                                 | cwt.        | 275            | \$12.00     | \$3,300.00       |
| <b>Total Revenue</b>                     |             |                |             | \$3,300.00       |
|                                          |             |                | Input Price | Cost             |
|                                          |             |                | Dollars Per | Dollars Per      |
| <b>Costs, \$/Acre</b>                    | Input Units | Input Quantity | Unit        | Acre             |
| <b>Variable Costs</b>                    |             |                |             |                  |
| Seed                                     | cwt.        | 15             | \$20.00     | \$300.00         |
| Seed Treatment/Cutting                   | cwt.        | 15             | \$3.00      | \$45.00          |
| <i>Fertilizer and Lime</i>               |             |                |             |                  |
| <i>Preplant and starter solution</i>     |             |                |             |                  |
| Lime (spread)                            | ton         | 0.5            | \$30.00     | \$15.00          |
| Bulk Spread                              | cwt.        | 10             | \$35.00     | \$350.00         |
| <i>Sidedressing or irrigation</i>        |             |                |             |                  |
| Nitrogen                                 | lb.         | 150            | \$0.31      | \$46.50          |
| <i>Herbicide</i>                         |             |                |             |                  |
| Other                                    | acre        | 1.00           | \$23.17     | \$23.17          |
| <i>Insecticide</i>                       |             |                |             |                  |
| Other                                    | acre        | 1.000          | \$91.02     | \$91.02          |
| <i>Fungicide</i>                         |             |                |             |                  |
| Other                                    | acre        | 1.000          | \$95.07     | \$95.07          |
| <i>Packaging</i>                         |             |                |             |                  |
| Bages                                    | bags        | 1,000          | \$0.16      | \$160.00         |
| Washer/Grader?Bagger                     | acre        | 1              | \$150.00    | \$150.00         |
| <i>Labor</i>                             |             |                |             |                  |
| Wash & Pack                              | hours       | 50             | \$12.50     | \$625.00         |
| Grade & Bag                              | hours       | 20             | \$12.50     | \$250.00         |
| Machinery fuel/repair/maintenance        | acre        | 1              | \$49.80     | \$49.80          |
| Irrigation                               | hours       | 4              | \$15.00     | \$60.00          |
| Marketing (10% of gross sales)           | \$          | \$3,300.00     | 10%         | \$330.00         |
| Interest on operating capital            | months      | 6              | 6%          | \$49.07          |
| <b>Fixed Costs</b>                       |             |                |             |                  |
| Land                                     | acre        | 1              | \$151.00    | \$151.00         |
| Machinery                                | acre        | 1              | \$114.87    | \$114.87         |
| Irrigation system                        | acre        | 1              | \$126.50    | \$126.50         |
| <b>Total Costs</b>                       |             |                |             | \$3,032.00       |
| <b>Returns over Total Costs, \$/Acre</b> |             |                |             | \$268.00         |

Data Source: University of Kentucky 2017 Vegetable and Melon Budgets (Large-scale).

**Missouri Pumpkin Enterprise Budget – Irrigated, Fresh Market**

|                                          |             |                | Sales Price | Gross            |
|------------------------------------------|-------------|----------------|-------------|------------------|
|                                          |             |                | Dollars Per | Returns          |
| <b>Revenues, \$/Acre</b>                 | Yield Units | Yield          | Unit        | Dollars Per Acre |
| Pumpkins (18 - 22 lb size)               | lb.         | 30,000         | \$0.17      | \$5,100.00       |
| <b>Total Revenue</b>                     |             |                |             | \$5,100.00       |
|                                          |             |                | Input Price | Cost             |
|                                          |             |                | Dollars Per | Dollars Per      |
| <b>Costs, \$/Acre</b>                    | Input Units | Input Quantity | Unit        | Acre             |
| <b>Variable Costs</b>                    |             |                |             |                  |
| Seed                                     | thousands   | 2              | \$50.00     | \$100.00         |
| Fertilizer and Lime                      |             |                |             |                  |
| <u>Preplant and starter solution</u>     |             |                |             |                  |
| Nitrogen                                 | lb.         | 100            | \$0.31      | \$31.00          |
| Potash                                   | lb.         | 80             | \$0.30      | \$24.00          |
| Fertigation (Calcium Nitrate)            | lb.         | 150            | \$0.35      | \$52.50          |
| Herbicide                                |             |                |             |                  |
| Other                                    | acre        | 1.00           | \$12.69     | \$12.69          |
| Insecticide                              |             |                |             |                  |
| Other                                    | acre        | 1.000          | \$29.85     | \$29.85          |
| Fungicide                                |             |                |             |                  |
| Other                                    | acre        | 1.000          | \$264.06    | \$264.06         |
| Plastic Mulch                            | acre        | 1.0            | \$143.00    | \$143.00         |
| Plastic Disposal                         | hours       | 10.0           | \$12.50     | \$125.00         |
| Drip Lines & Irrigation Fittings         | acre        | 1.0            | \$230.00    | \$230.00         |
| Pollination                              | hive        | 1.0            | \$75.00     | \$75.00          |
| Packaging                                |             |                |             |                  |
| Bins                                     | bins        | 42             | \$11.75     | \$493.50         |
| Labor                                    |             |                |             |                  |
| Harvest, Handling, & Hauling             | hours       | 85.71          | \$12.50     | \$1,071.43       |
| Machinery fuel/repair/maintenance        | acre        | 1              | \$43.61     | \$43.61          |
| Irrigation                               | acre        | 1              | \$50.00     | \$50.00          |
| Marketing (10% of gross sales)           | \$          | \$5,100.00     | 10%         | \$510.00         |
| Interest on operating capital            | months      | 6              | 6%          | \$50.23          |
| <b>Fixed Costs</b>                       |             |                |             |                  |
| Land                                     | acre        | 1              | \$151.00    | \$151.00         |
| Machinery                                | acre        | 1              | \$114.87    | \$114.87         |
| Irrigation system                        | acre        | 1              | \$126.50    | \$126.50         |
| <b>Total Costs</b>                       |             |                |             | \$3,698.23       |
| <b>Returns over Total Costs, \$/Acre</b> |             |                |             | \$1,401.77       |

Data Source: University of Kentucky 2017 Vegetable and Melon Budgets (Large-scale).

**Missouri Summer Squash Enterprise Budget – Trickle Irrigation, Fresh Market**

|                                   |             |             |             | Gross       |
|-----------------------------------|-------------|-------------|-------------|-------------|
|                                   |             |             | Sales Price | Returns     |
|                                   |             |             | Dollars Per | Dollars Per |
| Revenues, \$/Acre                 | Yield Units | Yield       | Unit        | Acre        |
| Summer squash (0.5 bu. or 21 lbs) | 0.5 bushel  | 1200        | \$12.60     | \$15,120.00 |
| Total Revenue                     |             |             |             | \$15,120.00 |
|                                   |             |             |             |             |
|                                   |             |             | Input Price | Cost        |
|                                   |             | Input       | Dollars Per | Dollars Per |
| Costs, \$/Acre                    | Input Units | Quantity    | Unit        | Acre        |
| Variable Costs                    |             |             |             |             |
| Seed                              | lb.         | 2           | \$31.95     | \$63.90     |
| Fertilizer and Lime               |             |             |             |             |
| Preplant and starter solution     |             |             |             |             |
| Nitrogen                          | lb.         | 50          | \$0.31      | \$15.50     |
| Phosphate                         | lb.         | 130         | \$0.32      | \$41.60     |
| Potash                            | lb.         | 170         | \$0.30      | \$51.00     |
| Lime (spread)                     | ton         | 0.5         | \$23.00     | \$11.50     |
| Sidedressing or irrigation        |             |             |             |             |
| Nitrogen                          | lb.         | 40          | \$0.31      | \$12.40     |
| Insecticide                       |             |             |             |             |
| Brigade WSB                       | oz.         | 18          | \$0.17      | \$3.06      |
| Fungicide                         |             |             |             |             |
| Bravo Weather Stick               | pt.         | 3.000       | \$7.25      | \$21.75     |
| Quadris                           | oz.         | 11.000      | \$1.56      | \$17.18     |
| Pollination                       | hive        | 1           | \$75.00     | \$75.00     |
| Drip Tape                         | roll        | 1.5         | \$59.41     | \$89.12     |
| Black plastic                     | roll        | 2.2         | \$129.99    | \$285.98    |
| Packaging                         |             |             |             |             |
| Boxes                             | item        | 1,200       | \$1.26      | \$1,512.00  |
| Labor                             |             |             |             |             |
| Operator labor                    | hours       | 7.83        | \$15.00     | \$117.50    |
| Irrigation labor                  | hours       | 8           | \$12.50     | \$100.00    |
| Harvest labor                     | hours       | 135         | \$12.50     | \$1,687.50  |
| Grade/pack labor                  | hours       | 105         | \$12.50     | \$1,312.50  |
| Plastic disposal labor            | hours       | 18          | \$12.50     | \$225.00    |
| Other labor                       | hours       | 5           | \$12.50     | \$62.50     |
| Machinery fuel/repair/maintenance | acre        | 1           | \$348.94    | \$348.94    |
| Irrigation fuel and oil           | hours       | 90          | \$0.40      | \$36.00     |
| Irrigation repairs/maintenance    | acre        | 1           | \$15.00     | \$15.00     |
| Marketing                         | acre        | \$15,120.00 | 10%         | \$1,512.00  |
| Miscellaneous expenses            | acre        | 1           | \$10.00     | \$10.00     |
| Interest on operating capital     | months      | 6           | 6%          | \$86.70     |
| Fixed Costs                       |             |             |             |             |
| Land                              | acre        | 1           | \$151.00    | \$151.00    |
| Machinery                         | acre        | 1           | \$193.69    | \$193.69    |
| Irrigation system                 | acre        | 1           | \$130.00    | \$130.00    |
| Total Costs                       |             |             |             | \$8,188.31  |
| Returns over Total Costs, \$/Acre |             |             |             | \$6,931.69  |

**Missouri Winter Squash Enterprise Budget – Trickle Irrigation, Fresh Market**

|                                   |             |                | Sales Price | Gross            |
|-----------------------------------|-------------|----------------|-------------|------------------|
|                                   |             |                | Dollars Per | Returns          |
| Revenues, \$/Acre                 | Yield Units | Yield          | Unit        | Dollars Per Acre |
| Winter squash (1 bu. or 50 lbs)   | bushel      | 400            | \$15.64     | \$6,256.00       |
| Total Revenue                     |             |                |             | \$6,256.00       |
|                                   |             |                | Input Price | Cost             |
|                                   |             |                | Dollars Per | Dollars Per      |
| Costs, \$/Acre                    | Input Units | Input Quantity | Unit        | Acre             |
| Variable Costs                    |             |                |             |                  |
| Seed                              | lb.         | 2              | \$42.95     | \$85.90          |
| Fertilizer and Lime               |             |                |             |                  |
| Preplant and starter solution     |             |                |             |                  |
| Nitrogen                          | lb.         | 50             | \$0.31      | \$15.50          |
| Phosphate                         | lb.         | 110            | \$0.32      | \$35.20          |
| Potash                            | lb.         | 150            | \$0.30      | \$45.00          |
| Lime (spread)                     | ton         | 0.5            | \$23.00     | \$11.50          |
| Sidedressing or irrigation        |             |                |             |                  |
| Nitrogen                          | lb.         | 20             | \$0.31      | \$6.20           |
| Herbicide                         |             |                |             |                  |
| Sandea                            | oz.         | 1.00           | \$37.00     | \$37.00          |
| Insecticide                       |             |                |             |                  |
| Brigade WSB                       | oz.         | 18             | \$0.17      | \$3.06           |
| Fungicide                         |             |                |             |                  |
| Bravo Weather Stick               | pt.         | 3.000          | \$7.25      | \$21.75          |
| Quadris                           | oz.         | 22.000         | \$1.56      | \$34.37          |
| Pollination                       | hive        | 1              | \$75.00     | \$75.00          |
| Drip Tape                         | roll        | 1.5            | \$59.41     | \$89.12          |
| Black plastic                     | roll        | 2.2            | \$129.99    | \$285.98         |
| Packaging                         |             |                |             |                  |
| Boxes                             | item        | 400            | \$1.26      | \$504.00         |
| Labor                             |             |                |             |                  |
| Operator labor                    | hours       | 7.59           | \$15.00     | \$113.82         |
| Irrigation labor                  | hours       | 8              | \$12.50     | \$100.00         |
| Harvest labor                     | hours       | 65             | \$12.50     | \$812.50         |
| Plastic disposal labor            | hours       | 18             | \$12.50     | \$225.00         |
| Other labor                       | hours       | 5              | \$12.50     | \$62.50          |
| Machinery fuel/repair/maintenance | acre        | 1              | \$316.80    | \$316.80         |
| Irrigation fuel and oil           | hours       | 90             | \$0.40      | \$36.00          |
| Irrigation repairs/maintenance    | acre        | 1              | \$15.00     | \$15.00          |
| Marketing                         | acre        | \$6,256.00     | 10%         | \$625.60         |
| Miscellaneous expenses            | acre        | 1              | \$10.00     | \$10.00          |
| Interest on operating capital     | months      | 6              | 6%          | \$57.11          |
| Fixed Costs                       |             |                |             |                  |
| Land                              | acre        | 1              | \$151.00    | \$151.00         |
| Machinery                         | acre        | 1              | \$173.84    | \$173.84         |
| Irrigation system                 | acre        | 1              | \$130.00    | \$130.00         |
| Total Costs                       |             |                |             | \$4,078.74       |
| Returns over Total Costs, \$/Acre |             |                |             | \$2,177.26       |

**Missouri Sweet Corn Enterprise Budget – Overhead Irrigation, Fresh Market**

|                                          |             |                | Sales Price | Gross Returns     |
|------------------------------------------|-------------|----------------|-------------|-------------------|
|                                          |             |                | Dollars Per | Dollars Per       |
| Revenues, \$/Acre                        | Yield Units | Yield          | Unit        | Acre              |
| Sweet Corn                               | dozen       | 1800           | \$2.39      | \$4,302.00        |
| <b>Total Revenue</b>                     |             |                |             | <b>\$4,302.00</b> |
|                                          |             |                | Input Price | Cost              |
|                                          |             |                | Dollars Per | Dollars Per       |
| Costs, \$/Acre                           | Input Units | Input Quantity | Unit        | Acre              |
| <b>Variable Costs</b>                    |             |                |             |                   |
| Seed                                     | lb.         | 12.5           | \$10.50     | \$131.25          |
| <i>Fertilizer and Lime</i>               |             |                |             |                   |
| <u>Preplant and starter solution</u>     |             |                |             |                   |
| Nitrogen                                 | lb.         | 60             | \$0.31      | \$18.60           |
| Phosphate                                | lb.         | 90             | \$0.32      | \$28.80           |
| Potash                                   | lb.         | 125            | \$0.30      | \$37.50           |
| Lime (spread)                            | ton         | 0.5            | \$23.00     | \$11.50           |
| <u>Sidedressing or irrigation</u>        |             |                |             |                   |
| Nitrogen                                 | lb.         | 70             | \$0.31      | \$21.70           |
| <i>Herbicide</i>                         |             |                |             |                   |
| Bicep II Magnum                          | pt.         | 4.00           | \$5.90      | \$23.60           |
| <i>Insecticide</i>                       |             |                |             |                   |
| Poncho                                   | oz.         | 0.202          | \$0.62      | \$0.13            |
| Brigade 2EC                              | oz.         | 12.800         | \$0.17      | \$2.18            |
| Pounce                                   | oz.         | 12.800         | \$0.48      | \$6.14            |
| Radiant 1SC                              | oz.         | 30.000         | \$5.70      | \$171.00          |
| <i>Packaging</i>                         |             |                |             |                   |
| Crates/boxes/bags                        | item        | 360            | \$1.50      | \$540.00          |
| <i>Labor</i>                             |             |                |             |                   |
| Operator labor                           | hours       | 1.97           | \$15.00     | \$29.60           |
| Irrigation labor                         | hours       | 2              | \$12.50     | \$25.00           |
| Harvest labor                            | hours       | 40             | \$12.50     | \$500.00          |
| Packing labor                            | hours       | 17             | \$12.50     | \$212.50          |
| Other labor                              | hours       | 5              | \$12.50     | \$62.50           |
| Machinery fuel/repair/maintenance        | acre        | 1              | \$57.38     | \$57.38           |
| Irrigation fuel and oil                  | hour        | 8              | \$4.00      | \$32.00           |
| Irrigation repairs/maintenance           | acre        | 1              | \$10.50     | \$10.50           |
| Marketing                                | acre        | \$4,302.00     | 10%         | \$430.20          |
| Miscellaneous expenses                   | acre        | 1              | \$10.00     | \$10.00           |
| Interest on operating capital            | months      | 6              | 6%          | \$36.58           |
| <b>Fixed Costs</b>                       |             |                |             |                   |
| Land                                     | acre        | 1              | \$151.00    | \$151.00          |
| Machinery                                | acre        | 1              | \$32.23     | \$32.23           |
| Irrigation system                        | acre        | 1              | \$126.50    | \$126.50          |
| <b>Total Costs</b>                       |             |                |             | <b>\$2,708.38</b> |
| <b>Returns over Total Costs, \$/Acre</b> |             |                |             | <b>\$1,593.62</b> |

**Missouri Sweet Potato Enterprise Budget – Irrigated, Fresh Market**

|                                   |             |            |                                    | Gross                          |
|-----------------------------------|-------------|------------|------------------------------------|--------------------------------|
|                                   |             |            | Sales Price<br>Dollars Per<br>Unit | Returns<br>Dollars Per<br>Acre |
| Revenues, \$/Acre                 | Yield Units | Yield      |                                    |                                |
| Sweet Potato (0.5 bu box)         |             |            |                                    |                                |
| US #1                             | box         | 460        | \$15.00                            | \$6,900.00                     |
| US #2                             | box         | 120        | \$12.86                            | \$1,542.86                     |
| US #3                             | box         | 120        | \$8.57                             | \$1,028.57                     |
| Total Revenue                     |             | 700        |                                    | \$9,471.43                     |
|                                   |             |            | Input Price                        | Cost                           |
|                                   |             | Input      | Dollars Per                        | Dollars Per                    |
| Costs, \$/Acre                    | Input Units | Quantity   | Unit                               | Acre                           |
| Variable Costs                    |             |            |                                    |                                |
| Plants                            | thous.      | 17         | \$29.00                            | \$493.00                       |
| Fertilizer and Lime               |             |            |                                    |                                |
| Preplant and starter solution     |             |            |                                    |                                |
| Fertilizer 6-6-18                 | lb.         | 1000       | \$0.33                             | \$330.00                       |
| Lime (spread)                     | ton         | 0.5        | \$23.00                            | \$11.50                        |
| Sidedressing or irrigation        |             |            |                                    |                                |
| Nitrogen                          | lb.         | 50         | \$0.31                             | \$15.50                        |
| Herbicide                         |             |            |                                    |                                |
| Glyphosate                        | pt.         | 2.00       | \$2.00                             | \$4.00                         |
| Valor SX                          | oz.         | 2.00       | \$4.75                             | \$9.50                         |
| Command 3ME                       | pt.         | 2.00       | \$18.00                            | \$36.00                        |
| Poast 1.5E                        | pt.         | 1.00       | \$13.44                            | \$13.44                        |
| Insecticide                       |             |            |                                    |                                |
| Brigade 2EC                       | oz.         | 12.800     | \$0.17                             | \$2.18                         |
| Lorsban 15G                       | lb.         | 13.300     | \$2.24                             | \$29.79                        |
| Nematicides                       | acre        | 1.000      | \$85.80                            | \$85.80                        |
| Packaging                         |             |            |                                    |                                |
| Boxes                             | containers  | 700        | \$1.75                             | \$1,225.00                     |
| Labor                             |             |            |                                    |                                |
| Irrigation labor                  | hours       | 8          | \$12.50                            | \$100.00                       |
| Harvest labor                     | hours       | 55         | \$12.50                            | \$687.50                       |
| Sort/grade/pack labor             | hours       | 55         | \$12.50                            | \$687.50                       |
| Other labor                       | hours       | 5          | \$12.50                            | \$62.50                        |
| Curing and Storage                | box         | 700        | \$1.25                             | \$875.00                       |
| Machinery fuel/repair/maintenance | acre        | 1          | \$216.11                           | \$216.11                       |
| Irrigation fuel and oil           | hour        | 8          | \$4.00                             | \$32.00                        |
| Irrigation repairs/maintenance    | acre        | 1          | \$10.50                            | \$10.50                        |
| Custom (skid loader @ \$70/hr)    | hours       | 3          | \$70.00                            | \$210.00                       |
| Marketing                         | acre        | \$9,471.43 | 10%                                | \$947.14                       |
| Miscellaneous expenses            | acre        | 1          | \$10.00                            | \$10.00                        |
| Interest on operating capital     | months      | 6          | 6%                                 | \$113.15                       |
| Fixed Costs                       |             |            |                                    |                                |
| Land                              | acre        | 1          | \$151.00                           | \$151.00                       |
| Machinery                         | acre        | 1          | \$125.17                           | \$125.17                       |
| Irrigation system                 | acre        | 1          | \$126.50                           | \$126.50                       |
| Total Costs                       |             |            |                                    | \$6,609.77                     |
| Returns over Total Costs, \$/Acre |             |            |                                    | \$2,861.65                     |

Data Sources: Clemson Cooperative Extension Sweet Potato Budgets 2016.

University of Kentucky 2017 Vegetable and Melon Budgets (Large-scale).

**Missouri Tomato Enterprise Budget – Irrigated, Fresh Market**

|                                   |             |             | Sales Price      | Gross            |
|-----------------------------------|-------------|-------------|------------------|------------------|
|                                   |             |             | Dollars Per      | Returns          |
| Revenues, \$/Acre                 | Yield Units | Yield       | Unit             | Dollars Per Acre |
| Tomato (20 lb per box)            | box         | 1300        | \$20.75          | \$26,975.00      |
| Total Revenue                     |             |             |                  | \$26,975.00      |
|                                   |             |             |                  |                  |
|                                   |             | Input       | Input Price      | Cost             |
| Costs, \$/Acre                    | Input Units | Quantity    | Dollars Per Unit | Dollars Per Acre |
| Variable Costs                    |             |             |                  |                  |
| Plants                            | thous.      | 4.5         | \$160.00         | \$720.00         |
| Fertilizer and Lime               |             |             |                  |                  |
| Preplant and starter solution     |             |             |                  |                  |
| Nitrogen                          | lb.         | 30          | \$0.31           | \$9.30           |
| Phosphate                         | lb.         | 200         | \$0.32           | \$64.00          |
| Potash                            | lb.         | 175         | \$0.30           | \$52.50          |
| Lime (spread)                     | ton         | 0.5         | \$23.00          | \$11.50          |
| Starter solution                  | cwt.        | 2           | \$68.75          | \$137.50         |
| Sidedressing or irrigation        |             |             |                  |                  |
| Nitrogen                          | lb.         | 80          | \$0.31           | \$24.80          |
| Herbicide                         |             |             |                  |                  |
| Glyphosate                        | pt.         | 2.00        | \$2.00           | \$4.00           |
| Sandea                            | oz.         | 0.50        | \$37.00          | \$18.50          |
| Poast 1.5E                        | pt.         | 1.00        | \$13.44          | \$13.44          |
| Insecticide                       |             |             |                  |                  |
| Admire Pro                        | oz.         | 7.000       | \$1.64           | \$11.50          |
| Radiant 1SC                       | oz.         | 30.000      | \$5.70           | \$171.00         |
| Brigade 2EC                       | oz.         | 10.000      | \$0.17           | \$1.70           |
| Mustang Max                       | oz.         | 8.000       | \$1.14           | \$9.12           |
| Oberon 2SC                        | oz.         | 8.000       | \$2.97           | \$23.76          |
| Fungicide                         |             |             |                  |                  |
| Bravo Weather Stick               | pt.         | 5.500       | \$7.25           | \$39.86          |
| Quadris                           | oz.         | 10.000      | \$1.56           | \$15.62          |
| Kocide 2000                       | lb.         | 4.500       | \$6.66           | \$29.98          |
| Drip Tape                         | roll        | 1.200       | \$59.41          | \$71.29          |
| Black plastic                     | roll        | 1.8         | \$129.99         | \$233.98         |
| Wood stakes                       | 100         | 44.0        | \$2.20           | \$96.80          |
| Twine (6,000 ft. per box)         | box         | 4.0         | \$8.70           | \$34.80          |
| Packaging                         |             |             |                  |                  |
| Boxes                             | containers  | 1,300       | \$1.26           | \$1,638.00       |
| Labor                             |             |             |                  |                  |
| Operator labor                    | hours       | 6.10        | \$15.00          | \$91.44          |
| Irrigation labor                  | hours       | 12          | \$12.50          | \$150.00         |
| Harvest labor                     | hours       | 430         | \$12.50          | \$5,375.00       |
| Grade/pack labor                  | hours       | 180         | \$12.50          | \$2,250.00       |
| Plastic disposal labor            | hours       | 18          | \$12.50          | \$225.00         |
| Other labor                       | hours       | 5           | \$12.50          | \$62.50          |
| Machinery fuel/repair/maintenance | acre        | 1           | \$318.55         | \$318.55         |
| Irrigation fuel and oil           | hour        | 64          | \$1.25           | \$80.00          |
| Irrigation repairs/maintenance    | acre        | 1           | \$15.00          | \$15.00          |
| Marketing                         | acre        | \$26,975.00 | 10%              | \$2,697.50       |
| Miscellaneous expenses            | acre        | 1           | \$10.00          | \$10.00          |
| Interest on operating capital     | months      | 6           | 6%               | \$124.81         |
| Fixed Costs                       |             |             |                  |                  |
| Land                              | acre        | 1           | \$151.00         | \$151.00         |
| Machinery                         | acre        | 1           | \$181.78         | \$181.78         |
| Irrigation system                 | acre        | 1           | \$130.00         | \$130.00         |
| Total Costs                       |             |             |                  | \$15,295.53      |
| Returns over Total Costs, \$/Acre |             |             |                  | \$11,679.47      |

**Missouri Seeded Watermelon Enterprise Budget – Trickle Irrigation, Fresh Market**

|                                      |             |            |                                    | Gross                          |
|--------------------------------------|-------------|------------|------------------------------------|--------------------------------|
|                                      |             |            | Sales Price<br>Dollars Per<br>Unit | Returns<br>Dollars Per<br>Acre |
| Revenues, \$/Acre                    | Yield Units | Yield      |                                    |                                |
| Watermelons (Seeded)                 | each        | 2400       | \$3.18                             | \$7,632.00                     |
| Total Revenue                        |             |            |                                    | \$7,632.00                     |
|                                      |             |            |                                    |                                |
|                                      |             | Input      | Input Price                        | Cost                           |
|                                      |             | Quantity   | Dollars Per<br>Unit                | Dollars Per<br>Acre            |
| Costs, \$/Acre                       | Input Units |            |                                    |                                |
| Variable Costs                       |             |            |                                    |                                |
| Plants                               | plants      | 800        | \$0.11                             | \$88.00                        |
| Fertilizer and Lime                  |             |            |                                    |                                |
| Preplant and starter solution        |             |            |                                    |                                |
| Nitrogen                             | lb.         | 50         | \$0.31                             | \$15.50                        |
| Phosphate                            | lb.         | 125        | \$0.32                             | \$40.00                        |
| Potash                               | lb.         | 100        | \$0.30                             | \$30.00                        |
| Lime (spread)                        | ton         | 0.5        | \$23.00                            | \$11.50                        |
| Starter solution                     | cwt.        | 0          | \$68.75                            | \$0.00                         |
| Sidedressing or irrigation           |             |            |                                    |                                |
| Nitrogen                             | lb.         | 45         | \$0.31                             | \$13.95                        |
| Herbicide                            |             |            |                                    |                                |
| Strategy                             | pt.         | 2.00       | \$12.30                            | \$24.60                        |
| Other                                | oz.         | 0.00       | \$0.00                             | \$0.00                         |
| Insecticide                          |             |            |                                    |                                |
| Assail 30 SG                         | oz.         | 4          | \$5.76                             | \$23.04                        |
| Brigade 2EC                          | oz.         | 12.000     | \$0.17                             | \$2.04                         |
| Other                                | oz.         | 0.000      | \$0.00                             | \$0.00                         |
| Fungicide                            |             |            |                                    |                                |
| Bravo Weather Stick                  | pt.         | 5.000      | \$7.25                             | \$36.25                        |
| Quadris                              | oz.         | 22.000     | \$1.56                             | \$34.32                        |
| Pollination                          | hive        | 1          | \$75.00                            | \$75.00                        |
| Drip Tape                            | roll        | 0.9        | \$59.41                            | \$53.47                        |
| Black plastic                        | roll        | 1.4        | \$129.99                           | \$181.99                       |
| Packaging                            |             |            |                                    |                                |
| Packing bins (24", 800 lbs)          | item        | 65         | \$6.00                             | \$390.00                       |
| Labor                                |             |            |                                    |                                |
| Operator labor                       | hours       | 4.44       | \$15.00                            | \$66.63                        |
| Irrigation labor                     | hours       | 7          | \$12.50                            | \$87.50                        |
| Harvest labor (harvesting & grading) | hours       | 80         | \$12.50                            | \$1,000.00                     |
| Plastic disposal labor               | hours       | 18         | \$12.50                            | \$225.00                       |
| Other labor                          | hours       | 5          | \$12.50                            | \$62.50                        |
| Machinery fuel/repair/maintenance    | acre        | 1          | \$257.08                           | \$257.08                       |
| Irrigation fuel and oil              | hours       | 28         | \$1.25                             | \$35.00                        |
| Irrigation repairs/maintenance       | acre        | 1          | \$15.00                            | \$15.00                        |
| Marketing                            | acre        | \$7,632.00 | 10%                                | \$763.20                       |
| Miscellaneous expenses               | acre        | 1          | \$10.00                            | \$10.00                        |
| Interest on operating capital        | months      | 6          | 6%                                 | \$46.60                        |
| Fixed Costs                          |             |            |                                    |                                |
| Land                                 | acre        | 1          | \$151.00                           | \$151.00                       |
| Machinery                            | acre        | 1          | \$149.16                           | \$149.16                       |
| Irrigation system                    | acre        | 1          | \$130.00                           | \$130.00                       |
| Total Costs                          |             |            |                                    | \$4,018.33                     |
| Returns over Total Costs, \$/Acre    |             |            |                                    | \$3,613.67                     |

**Missouri Seedless Watermelon Enterprise Budget – Trickle Irrigation, Fresh Market**

|                                      |             |            |                                    | Gross Returns                  |
|--------------------------------------|-------------|------------|------------------------------------|--------------------------------|
|                                      |             |            | Sales Price<br>Dollars Per<br>Unit | Returns<br>Dollars Per<br>Acre |
| Revenues, \$/Acre                    | Yield Units | Yield      |                                    |                                |
| Watermelons (Seeded)                 | each        | 792        | \$3.18                             | \$2,518.56                     |
| Watermelons (Seedless)               | each        | 1,608      | \$3.21                             | \$5,161.68                     |
| Total Revenue                        |             |            |                                    | \$7,680.24                     |
|                                      |             |            |                                    |                                |
|                                      |             | Input      | Input Price<br>Dollars Per<br>Unit | Cost<br>Dollars Per<br>Acre    |
| Costs, \$/Acre                       | Input Units | Quantity   |                                    |                                |
| Variable Costs                       |             |            |                                    |                                |
| Plants                               |             |            |                                    |                                |
| Seeded                               | plants      | 500        | \$0.11                             | \$55.00                        |
| Seedless                             | plants      | 1,000      | \$0.30                             | \$300.00                       |
| Fertilizer and Lime                  |             |            |                                    |                                |
| Preplant and starter solution        |             |            |                                    |                                |
| Nitrogen                             | lb.         | 50         | \$0.31                             | \$15.50                        |
| Phosphate                            | lb.         | 125        | \$0.32                             | \$40.00                        |
| Potash                               | lb.         | 100        | \$0.30                             | \$30.00                        |
| Lime (spread)                        | ton         | 0.5        | \$23.00                            | \$11.50                        |
| Sidedressing or irrigation           |             |            |                                    |                                |
| Nitrogen                             | lb.         | 45         | \$0.31                             | \$13.95                        |
| Herbicide                            |             |            |                                    |                                |
| Strategy                             | pt.         | 2.00       | \$12.30                            | \$24.60                        |
| Insecticide                          |             |            |                                    |                                |
| Assail 30 SG                         | oz.         | 4          | \$5.76                             | \$23.04                        |
| Brigade 2EC                          | oz.         | 12.000     | \$0.17                             | \$2.04                         |
| Fungicide                            |             |            |                                    |                                |
| Bravo Weather Stick                  | pt.         | 5.000      | \$7.25                             | \$36.25                        |
| Quadris                              | oz.         | 22.000     | \$1.56                             | \$34.32                        |
| Pollination                          | hive        | 1          | \$75.00                            | \$75.00                        |
| Drip Tape                            | roll        | 0.9        | \$59.41                            | \$53.47                        |
| Black plastic                        | roll        | 1.4        | \$129.99                           | \$181.99                       |
| Packaging                            |             |            |                                    |                                |
| Packing bins (24", 800 lbs)          | item        | 51         | \$6.00                             | \$306.00                       |
| Labor                                |             |            |                                    |                                |
| Operator labor                       | hours       | 4.44       | \$15.00                            | \$66.63                        |
| Irrigation labor                     | hours       | 7          | \$12.50                            | \$87.50                        |
| Harvest labor (harvesting & grading) | hours       | 80         | \$12.50                            | \$1,000.00                     |
| Plastic disposal labor               | hours       | 18         | \$12.50                            | \$225.00                       |
| Other labor                          | hours       | 5          | \$12.50                            | \$62.50                        |
| Machinery fuel/repair/maintenance    | acre        | 1          | \$257.08                           | \$257.08                       |
| Irrigation fuel and oil              | hours       | 28         | \$1.25                             | \$35.00                        |
| Irrigation repairs/maintenance       | acre        | 1          | \$15.00                            | \$15.00                        |
| Marketing                            | acre        | \$7,680.24 | 10%                                | \$768.02                       |
| Miscellaneous expenses               | acre        | 1          | \$10.00                            | \$10.00                        |
| Interest on operating capital        | months      | 6          | 6%                                 | \$52.09                        |
| Fixed Costs                          |             |            |                                    |                                |
| Land                                 | acre        | 1          | \$151.00                           | \$151.00                       |
| Machinery                            | acre        | 1          | \$149.16                           | \$149.16                       |
| Irrigation system                    | acre        | 1          | \$130.00                           | \$130.00                       |
| Total Costs                          |             |            |                                    | \$4,211.64                     |
| Returns over Total Costs, \$/Acre    |             |            |                                    | \$3,468.60                     |

## Perennial Crops

As you utilize these budgets you should always begin by customizing the budget to your farm. Your operation may have important differences in soil fertility, pests, irrigation, labor, etc. These budgets provide a benchmark from which to start but are really only the beginning of developing sound financial budgets for your operation. While we do not discuss each crop's budget in detail, you are welcome to contact us with questions, corrections, additional details, and comments.

For perennial crops, the enterprise budgets present the cost and returns per acre for multiple years. With perennial crops, yields usually increase for the first several years of production and then fall off at the end of the crop's life cycle. We have attempted to show the ramp up in yields for each crop. These budgets don't show the details on the number of years to breakeven but those are included in a summary at the end of these budgets.

At the top of each budget, the yield and price of the specialty crop budget is listed for each year until yields increase to the level for a mature crop. For many of the crops we are using yields from surrounding states because there is no NASS data reported for Missouri. Sales prices are taken from the Central Missouri Produce Auction if they have a representative price for the commodity. In some cases, they do not have the crop or there are too few observations so the Chicago terminal market price is used because it is the closest terminal market where USDA reports prices. Note that both crop prices and input prices are held constant over the years.

Variable costs are based on the quantity of inputs multiplied by the price. The input quantities are based on surrounding states and prices were cross referenced with price reported by various input suppliers via the internet. Labor rates have been assumed to be \$12.50 per hour for hired labor and \$15.00 per hour for operator labor across all budgets. Marketing costs are generally reported as a percentage of sales. They are based on the specialty commodity but generally average around 10% of sales. These costs are incurred in various ways with the most obvious example being commissions charged by auction markets or brokers. In Farmers' Markets, these costs are reflected in hours spent at the market directly selling to customers as well as promotional materials.

Land costs are based on average rental rates reported in Extension budgets for Missouri. Machinery and irrigation fixed cost are based on reported rates from surrounding states.

At the bottom of each budget, the returns over total costs are reported. These returns are calculated as total revenue less total variable and fixed costs.

**Missouri Apple Enterprise Budget – Trickle Irrigation, Fresh Market**

|                                      | Yield<br>Units | Year 1-Site Preparation |                  |                       | Year 2-Planting Year |                  |                       | Years 3 & 4-Growing Years |                  |                       |
|--------------------------------------|----------------|-------------------------|------------------|-----------------------|----------------------|------------------|-----------------------|---------------------------|------------------|-----------------------|
|                                      |                | Yield                   | Gross            |                       | Yield                | Sales            |                       | Yield                     | Gross            |                       |
|                                      |                |                         | Sales Price      | Returns               |                      | Price            | Returns               |                           | Price            | Returns               |
|                                      |                |                         | Dollars Per Unit | Dollars Per Acre      |                      | Dollars Per Unit | Dollars Per Acre      |                           | Dollars Per Unit | Dollars Per Acre      |
| Revenues, \$/Acre                    |                |                         |                  |                       |                      |                  |                       |                           |                  |                       |
| Fresh Apple Sales                    | bushels        | 0                       | 13.8             | \$0.00                | 0                    | 13.8             | \$0.00                | 0.0                       | 13.8             | \$0.00                |
| Total Revenue                        |                |                         |                  | \$0.00                |                      |                  | \$0.00                |                           |                  | \$0.00                |
|                                      |                |                         |                  |                       |                      |                  |                       |                           |                  |                       |
|                                      | Input<br>Units | Year 1-Site Preparation |                  |                       | Year 2-Planting Year |                  |                       | Years 3 & 4-Growing Years |                  |                       |
|                                      |                | Input<br>Quantity       | Input Price      |                       | Input<br>Quantity    | Input            |                       | Input<br>Quantity         | Input            |                       |
|                                      |                |                         | Dollars Per Unit | Cost Dollars Per Acre |                      | Price Dollars    | Cost Dollars Per Acre |                           | Price Dollars    | Cost Dollars Per Acre |
|                                      |                |                         |                  |                       |                      |                  |                       |                           |                  |                       |
| Variable Costs, \$/Acre              |                |                         |                  |                       |                      |                  |                       |                           |                  |                       |
| Preharvest Costs                     |                |                         |                  |                       |                      |                  |                       |                           |                  |                       |
| Apple Trees                          | plants         | 0                       | 6                | \$0.00                | 300                  | 6                | \$1,800.00            | 0                         | 6                | \$0.00                |
| Fescue seed                          | pounds         | 12                      | 2.56             | \$30.72               | 0                    | 2.56             | \$0.00                | 0                         | 2.56             | \$0.00                |
| Soil test                            | soil test      | 0                       | 12.5             | \$0.00                | 0                    | 12.5             | \$0.00                | 0                         | 12.5             | \$0.00                |
| Fertilizer & Lime                    | acre           |                         |                  |                       |                      |                  |                       |                           |                  |                       |
| Nitrogen                             | pounds         | 20                      | 0.23             | \$4.60                | 20                   | 0.23             | \$4.60                | 20                        | 0.23             | \$4.60                |
| Phosphorous                          | pounds         | 30                      | 0.28             | \$8.40                | 30                   | 0.28             | \$8.40                | 30                        | 0.28             | \$8.40                |
| Potassium                            | pounds         | 30                      | 0.13             | \$3.90                | 30                   | 0.13             | \$3.90                | 30                        | 0.13             | \$3.90                |
| Lime                                 | tons           | 0.5                     | 23               | \$11.50               | 0                    | 23               | \$0.00                | 0                         | 23               | \$0.00                |
| Calcium Chloride                     | pounds         | 0                       | 0.43             | \$0.00                | 0                    | 0.43             | \$0.00                | 0                         | 0.43             | \$0.00                |
| Herbicide                            | acre           | 1                       | 15               | \$15.00               | 1                    | 60               | \$60.00               | 1                         | 90               | \$90.00               |
| Insecticides                         | acre           | 0                       | 0                | \$0.00                | 0                    | 54.8             | \$0.00                | 1                         | 40               | \$40.00               |
| Fungicides                           | acre           | 0                       | 0                | \$0.00                | 0                    | 70.5             | \$0.00                | 1                         | 48               | \$48.00               |
| Fuel, Oil, Grease                    | acre           | 1                       | 18               | \$18.00               | 1                    | 18               | \$18.00               | 1                         | 5                | \$5.00                |
| Repairs                              | acre           | 1                       | 15               | \$15.00               | 1                    | 15               | \$15.00               | 1                         | 5                | \$5.00                |
| Miscellaneous                        | acre           | 1                       | 12               | \$12.00               | 1                    | 15               | \$15.00               | 1                         | 12               | \$12.00               |
| Drip tape                            | feet           | 0                       | 0.032            | \$0.00                | 0                    | 0.032            | \$0.00                | 0                         | 0.032            | \$0.00                |
| Tree Guards                          | unit           | 0                       | 1.2              | \$0.00                | 0                    | 1.2              | \$0.00                | 0                         | 1.2              | \$0.00                |
| Plant analysis kit                   | 1 kit          | 0                       | 30               | \$0.00                | 0                    | 30               | \$0.00                | 0                         | 30               | \$0.00                |
| Irrigation                           | months         | 0                       | 41.33            | \$0.00                | 0                    | 41.33            | \$0.00                | 0                         | 41.33            | \$0.00                |
| Pollination                          | months         | 0                       | 100              | \$0.00                | 0                    | 100              | \$0.00                | 0                         | 100              | \$0.00                |
| General labor                        | hours          | 30                      | 12.5             | \$375.00              | 30                   | 12.5             | \$375.00              | 50                        | 12.5             | \$625.00              |
| Interest on operating capital        | months         | 6                       | 6%               | \$14.82               | 6                    | 6%               | \$69.00               | 12                        | 6%               | \$50.51               |
| Harvest Costs                        |                |                         |                  |                       |                      |                  |                       |                           |                  |                       |
| Operator Labor                       | hours          | 6.0                     | 15               | \$90.00               | 10.0                 | 15               | \$150.00              | 8.0                       | 15               | \$120.00              |
| Harvest labor                        | hours          | 0                       | 12.5             | \$0.00                | 0                    | 12.5             | \$0.00                | 0                         | 12.5             | \$0.00                |
| Bags - 10 pound plastic              | containers     | 0                       | 0.189            | \$0.00                | 0                    | 0.189            | \$0.00                | 0                         | 0.189            | \$0.00                |
| Marketing Costs                      | 10% of gross   | 0                       | 0.1              | \$0.00                | 0                    | 0.1              | \$0.00                | 0                         | 0.1              | \$0.00                |
| Refrigeration                        | day            | 0                       | 0.25             | \$0.00                | 0                    | 0.25             | \$0.00                | 0                         | 0.25             | \$0.00                |
| Total Variable Costs                 |                |                         |                  | \$598.94              |                      |                  | \$2,518.90            |                           |                  | \$1,012.41            |
| Fixed Costs                          |                |                         |                  |                       |                      |                  |                       |                           |                  |                       |
| Land                                 | acre           | 1                       | 151              | \$151.00              | 1                    | 151              | \$151.00              | 1                         | 151              | \$151.00              |
| Facilities and Equipment             | acre           | 1                       | 225              | \$225.00              | 1                    | 225              | \$225.00              | 1                         | 225              | \$225.00              |
| Machinery & Equipment                | acre           | 1                       | 38               | \$38.00               | 1                    | 38               | \$38.00               | 1                         | 38               | \$38.00               |
| Total Fixed Costs                    |                |                         |                  | \$414.00              |                      |                  | \$414.00              |                           |                  | \$414.00              |
| Total Costs Including Operator Labor |                |                         |                  | \$1,012.94            |                      |                  | \$2,932.90            |                           |                  | \$1,426.41            |
| Returns over Total Costs, \$/Acre    |                |                         |                  | -\$1,012.94           |                      |                  | -\$2,932.90           |                           |                  | -\$1,426.41           |

**Missouri Apple Enterprise Budget – Trickle Irrigation, Fresh Market, (continued)**

|                                             | Yield Units  | Year 5 First Bearing Year |                              |                          | Year 6 Second Bearing Year |                              |                          | Year 7 Third Bearing Year |                              |                          |
|---------------------------------------------|--------------|---------------------------|------------------------------|--------------------------|----------------------------|------------------------------|--------------------------|---------------------------|------------------------------|--------------------------|
|                                             |              | Gross                     |                              |                          | Gross                      |                              |                          | Gross                     |                              |                          |
|                                             |              | Yield                     | Sales Price Dollars Per Unit | Returns Dollars Per Acre | Yield                      | Sales Price Dollars Per Unit | Returns Dollars Per Acre | Yield                     | Sales Price Dollars Per Unit | Returns Dollars Per Acre |
| <b>Revenues, \$/Acre</b>                    |              |                           |                              |                          |                            |                              |                          |                           |                              |                          |
| Fresh Apple Sales                           | bushels      | 280.0                     | 13.8                         | \$3,864.00               | 500.0                      | 13.8                         | \$6,900.00               | 725.0                     | 13.8                         | \$10,005.00              |
| <b>Total Revenue</b>                        |              |                           |                              | \$3,864.00               |                            |                              | \$6,900.00               |                           |                              | \$10,005.00              |
|                                             | Input Units  | Year 5 First Bearing Year |                              |                          | Year 6 Second Bearing Year |                              |                          | Year 7 Third Bearing Year |                              |                          |
|                                             |              | Input Quantity            | Input Price Dollars Per Unit | Cost Dollars Per Acre    | Input Quantity             | Input Price Dollars Per Unit | Cost Dollars Per Acre    | Input Quantity            | Input Price Dollars Per Unit | Cost Dollars Per Acre    |
|                                             |              |                           |                              |                          |                            |                              |                          |                           |                              |                          |
| <b>Variable Costs, \$/Acre</b>              |              |                           |                              |                          |                            |                              |                          |                           |                              |                          |
| <b>Preharvest Costs</b>                     |              |                           |                              |                          |                            |                              |                          |                           |                              |                          |
| Apple Trees                                 | plants       | 0                         | 6                            | \$0.00                   | 0                          | 6                            | \$0.00                   | 0                         | 6                            | \$0.00                   |
| Fescue seed                                 | pounds       | 0                         | 2.56                         | \$0.00                   | 0                          | 2.56                         | \$0.00                   | 0                         | 2.56                         | \$0.00                   |
| Soil test                                   | soil test    | 0                         | 12.5                         | \$0.00                   | 0                          | 12.5                         | \$0.00                   | 0                         | 12.5                         | \$0.00                   |
| <b>Fertilizer &amp; Lime</b>                | acre         |                           |                              |                          |                            |                              |                          |                           |                              |                          |
| Nitrogen                                    | pounds       | 20                        | 0.23                         | \$4.60                   | 20                         | 0.23                         | \$4.60                   | 20                        | 0.23                         | \$4.60                   |
| Phosphorous                                 | pounds       | 30                        | 0.28                         | \$8.40                   | 30                         | 0.28                         | \$8.40                   | 30                        | 0.28                         | \$8.40                   |
| Potassium                                   | pounds       | 30                        | 0.13                         | \$3.90                   | 30                         | 0.13                         | \$3.90                   | 30                        | 0.13                         | \$3.90                   |
| Lime                                        | tons         | 0                         | 23                           | \$0.00                   | 0                          | 23                           | \$0.00                   | 0                         | 23                           | \$0.00                   |
| Calcium Chloride                            | pounds       | 30                        | 0.43                         | \$12.90                  | 30                         | 0.43                         | \$12.90                  | 30                        | 0.43                         | \$12.90                  |
| Herbicide                                   | acre         | 1                         | 15                           | \$15.00                  | 1                          | 15                           | \$15.00                  | 1                         | 15                           | \$15.00                  |
| Insecticides                                | acre         | 1                         | 110                          | \$110.00                 | 1                          | 110                          | \$110.00                 | 1                         | 110                          | \$110.00                 |
| Fungicides                                  | acre         | 1                         | 220                          | \$220.00                 | 1                          | 220                          | \$220.00                 | 1                         | 220                          | \$220.00                 |
| Fuel, Oil, Grease                           | acre         | 1                         | 20                           | \$20.00                  | 1                          | 20                           | \$20.00                  | 1                         | 20                           | \$20.00                  |
| Repairs                                     | acre         | 1                         | 15                           | \$15.00                  | 1                          | 15                           | \$15.00                  | 1                         | 15                           | \$15.00                  |
| Miscellaneous                               | acre         | 1                         | 15                           | \$15.00                  | 1                          | 15                           | \$15.00                  | 1                         | 15                           | \$15.00                  |
| Drip tape                                   | feet         | 0                         | 0.032                        | \$0.00                   | 0                          | 0.032                        | \$0.00                   | 0                         | 0.032                        | \$0.00                   |
| Tree Guards                                 | unit         | 0                         | 1.2                          | \$0.00                   | 0                          | 1.2                          | \$0.00                   | 0                         | 1.2                          | \$0.00                   |
| Plant analysis kit                          | 1 kit        | 0                         | 30                           | \$0.00                   | 0                          | 30                           | \$0.00                   | 0                         | 30                           | \$0.00                   |
| Irrigation                                  | months       | 5                         | 41.33                        | \$206.65                 | 5                          | 41.33                        | \$206.65                 | 5                         | 41.33                        | \$206.65                 |
| Pollination                                 | months       | 1                         | 100                          | \$100.00                 | 1                          | 100                          | \$100.00                 | 1                         | 100                          | \$100.00                 |
| General labor                               | hours        | 50                        | 12.5                         | \$625.00                 | 10                         | 12.5                         | \$125.00                 | 10                        | 12.5                         | \$125.00                 |
| Interest on operating capital               | months       | 12                        | 6%                           | \$81.39                  | 12                         | 6%                           | \$51.39                  | 12                        | 6%                           | \$51.39                  |
| <b>Harvest Costs</b>                        |              |                           |                              |                          |                            |                              |                          |                           |                              |                          |
| Operator Labor                              | hours        | 10.00                     | 15                           | \$150.00                 | 10.00                      | 15                           | \$150.00                 | 10.00                     | 15                           | \$150.00                 |
| Harvest labor                               | hours        | 48.5333333                | 12.5                         | \$606.67                 | 86.6666667                 | 12.5                         | \$1,083.33               | 125.666667                | 12.5                         | \$1,570.83               |
| Bags - 10 pound plastic                     | containers   | 1344                      | 0.189                        | \$254.02                 | 2400                       | 0.189                        | \$453.60                 | 3480                      | 0.189                        | \$657.72                 |
| Marketing Costs                             | 10% of gross | 3864                      | 0.1                          | \$386.40                 | 6900                       | 0.1                          | \$690.00                 | 10005                     | 0.1                          | \$1,000.50               |
| Refrigeration                               | day          | 280.0                     | 0.25                         | \$70.00                  | 500.0                      | 0.25                         | \$125.00                 | 725.0                     | 0.25                         | \$181.25                 |
| <b>Total Variable Costs</b>                 |              |                           |                              | \$2,904.92               |                            |                              | \$3,409.77               |                           |                              | \$4,468.14               |
| <b>Fixed Costs</b>                          |              |                           |                              |                          |                            |                              |                          |                           |                              |                          |
| Land                                        | acre         | 1                         | 151                          | \$151.00                 | 1                          | 151                          | \$151.00                 | 1                         | 151                          | \$151.00                 |
| Facilities and Equipment                    | acre         | 1                         | 225                          | \$225.00                 | 1                          | 225                          | \$225.00                 | 1                         | 225                          | \$225.00                 |
| Machinery & Equipment                       | acre         | 1                         | 38                           | \$38.00                  | 1                          | 38                           | \$38.00                  | 1                         | 38                           | \$38.00                  |
| <b>Total Fixed Costs</b>                    |              |                           |                              | \$414.00                 |                            |                              | \$414.00                 |                           |                              | \$414.00                 |
| <b>Total Costs Including Operator Labor</b> |              |                           |                              | \$3,318.92               |                            |                              | \$3,823.77               |                           |                              | \$4,882.14               |
| <b>Returns over Total Costs, \$/Acre</b>    |              |                           |                              | \$545.08                 |                            |                              | \$3,076.23               |                           |                              | \$5,122.86               |

**Missouri Asparagus Enterprise Budget – Trickle Irrigation, Fresh Market**

| Revenues, \$/Acre    | Yield Units | Year 1-Establishment Year |                              |                                | Year 2-First Production Year |                              |                                |
|----------------------|-------------|---------------------------|------------------------------|--------------------------------|------------------------------|------------------------------|--------------------------------|
|                      |             | Yield                     | Sales Price Dollars Per Unit | Gross Returns Dollars Per Acre | Yield                        | Sales Price Dollars Per Unit | Gross Returns Dollars Per Acre |
|                      |             |                           |                              |                                |                              |                              |                                |
|                      |             |                           |                              |                                |                              |                              |                                |
| Asparagus            | pounds      | 0                         | 2.5                          | \$0.00                         | 500                          | 2.5                          | \$1,250.00                     |
| <b>Total Revenue</b> |             |                           |                              | \$0.00                         |                              |                              | \$1,250.00                     |

| Variable Costs, \$/Acre         | Input Units | Year 1-Establishment Year |                              |                       | Year 2-First Production Year |                              |                       |
|---------------------------------|-------------|---------------------------|------------------------------|-----------------------|------------------------------|------------------------------|-----------------------|
|                                 |             | Input Quantity            | Input Price Dollars Per Unit | Cost Dollars Per Acre | Input Quantity               | Input Price Dollars Per Unit | Cost Dollars Per Acre |
|                                 |             |                           |                              |                       |                              |                              |                       |
|                                 |             |                           |                              |                       |                              |                              |                       |
| Asparagus crowns                | each        | 13000                     | 0.57                         | \$7,410.00            | 0                            | 0.57                         | \$0.00                |
| <b>Custom hire</b>              |             |                           |                              |                       |                              |                              |                       |
| Soil test                       | soil test   | 1                         | 12.5                         | \$12.50               | 0                            | 12.50                        | \$0.00                |
| Plowing                         | acre        | 1                         | 25.2                         | \$25.20               | 0                            | 25.20                        | \$0.00                |
| Disking                         | times       | 2                         | 19.90                        | \$39.80               | 0                            | 19.90                        | \$0.00                |
| Harrowing                       | acre        | 1                         | 14.40                        | \$14.40               | 0                            | 14.40                        | \$0.00                |
| Fertilizer spreading            | acre        | 1                         | 8.20                         | \$8.20                | 1                            | 8.20                         | \$8.20                |
| <b>Fertilizer/lime</b>          |             |                           |                              |                       |                              |                              |                       |
| Lime plus spreading             | ton         | 0.5                       | 23                           | \$11.50               | 0                            | 23.00                        | \$0.00                |
| Nitrogen                        | pound       | 50                        | 0.31                         | \$15.50               | 50                           | 0.31                         | \$15.50               |
| Phosphorus                      | pound       | 75                        | 0.32                         | \$24.00               | 25                           | 0.32                         | \$8.00                |
| Potassium                       | poiund      | 150                       | 0.30                         | \$45.00               | 75                           | 0.30                         | \$22.50               |
| Fungicides                      | acre        | 0                         | 0.00                         | \$0.00                | 1                            | 86.24                        | \$86.24               |
| Insecticides                    | acre        | 0                         | 0.00                         | \$0.00                | 1                            | 57.99                        | \$57.99               |
| Herbicides                      | acre        | 1                         | 20.61                        | \$20.61               | 1                            | 83.23                        | \$83.23               |
| Drip tape                       | feet        | 7920                      | 0.02                         | \$158.40              | 0                            | 0                            | \$0.00                |
| <b>Harvest/Marketing</b>        |             |                           |                              |                       |                              |                              |                       |
| Boxes (30#)                     | each        | 0                         | 3.45                         | \$0.00                | 17                           | 3.45                         | \$58.65               |
| Bands                           | 100         | 0                         | 1.40                         | \$0.00                | 5                            | 1.40                         | \$7.00                |
| Marketing (15% of sales)        | 15%         | \$0.00                    | 15%                          | \$0.00                | \$1,250                      | 15%                          | \$187.50              |
| <b>Labor</b>                    |             |                           |                              |                       |                              |                              |                       |
| Operator                        | hours       | 1.75                      | 15                           | \$26.25               | 2.3                          | 15                           | \$34.50               |
| Seasonal                        | hours       | 3.4                       | 12.5                         | \$42.50               | 0                            | 12.5                         | \$0.00                |
| Implement                       | hours       | 0                         | 12.5                         | \$0.00                | 3.4                          | 12.5                         | \$42.50               |
| Harvest                         | hours       | 0                         | 12.5                         | \$0.00                | 21                           | 12.5                         | \$262.50              |
| Diesel fuel                     | gallon      | 42                        | 2.6                          | \$109.20              | 43                           | 2.60                         | \$111.80              |
| <b>Repairs and Maintenance</b>  |             |                           |                              |                       |                              |                              |                       |
| Tractors                        | acre        | 1                         | 25.4                         | \$25.40               | 1                            | 31.58                        | \$31.58               |
| Implements                      | acre        | 1                         | 54.29                        | \$54.29               | 1                            | 66.83                        | \$66.83               |
| Interest on operating capital   | months      | 6                         | 6%                           | \$235.62              | 6                            | 6%                           | \$283.54              |
| Land                            | acre        | 1                         | 151                          | \$151.00              | 1                            | 151                          | \$151.00              |
| Machinery                       | acre        | 1                         | 213.22                       | \$213.22              | 1                            | 219.12                       | \$219.12              |
| Food safety inspection          | acre        | 0                         | 250                          | \$0.00                | 1                            | 250                          | \$250.00              |
| <b>Total Costs</b>              |             |                           |                              | \$8,642.59            |                              |                              | \$1,988.18            |
| <b>Returns over Total Costs</b> |             |                           |                              | -\$8,642.59           |                              | -\$738.18                    |                       |

Source: Pennsylvania State University Asparagus Production (<https://extension.psu.edu/asparagus-prod#section-10>) Sample Asparagus Budgets.

**Missouri Asparagus Enterprise Budget – Trickle Irrigation, Fresh Market (continued)**

| Revenues, \$/Acre    | Yield<br>Units | Year 3-Second Production Year |                     |                     | Year 4-Third Production Year |                     |                     |
|----------------------|----------------|-------------------------------|---------------------|---------------------|------------------------------|---------------------|---------------------|
|                      |                | Yield                         | Gross               |                     | Yield                        | Gross               |                     |
|                      |                |                               | Sales Price         | Returns             |                              | Sales Price         | Returns             |
|                      |                |                               | Dollars<br>Per Unit | Dollars Per<br>Acre |                              | Dollars Per<br>Unit | Dollars Per<br>Acre |
| Asparagus            | pounds         | 1000.0                        | 2.5                 | \$2,500.00          | 4000.0                       | 2.5                 | \$10,000.00         |
| <b>Total Revenue</b> |                |                               |                     | <b>\$2,500.00</b>   |                              |                     | <b>\$10,000.00</b>  |

| Variable Costs, \$/Acre         | Input<br>Units | Year 3-Second Production Year |                     |                     | Year 4-Third Production Year |                     |                     |
|---------------------------------|----------------|-------------------------------|---------------------|---------------------|------------------------------|---------------------|---------------------|
|                                 |                | Input<br>Quantity             | Input               |                     | Input<br>Quantity            | Input               |                     |
|                                 |                |                               | Price               | Cost                |                              | Price               | Cost                |
|                                 |                |                               | Dollars<br>Per Unit | Dollars Per<br>Acre |                              | Dollars Per<br>Unit | Dollars Per<br>Acre |
| Asparagus crowns                | each           | 0                             | 0.57                | \$0.00              | 0                            | 0.57                | \$0.00              |
| <b>Custom hire</b>              |                |                               |                     |                     |                              |                     |                     |
| Soil test                       | soil test      | 0                             | 12.50               | \$0.00              | 0                            | 12.50               | \$0.00              |
| Plowing                         | acre           | 0                             | 25.20               | \$0.00              | 0                            | 25.20               | \$0.00              |
| Disking                         | times          | 0                             | 19.90               | \$0.00              | 0                            | 19.90               | \$0.00              |
| Harrowing                       | acre           | 0                             | 14.40               | \$0.00              | 0                            | 14.40               | \$0.00              |
| Fertilizer spreading            | acre           | 1                             | 8.20                | \$8.20              | 1                            | 8.20                | \$8.20              |
| <b>Fertilizer/lime</b>          |                |                               |                     |                     |                              |                     |                     |
| Lime plus spreading             | ton            | 0                             | 23.00               | \$0.00              | 0                            | 23.00               | \$0.00              |
| Nitrogen                        | pound          | 50                            | 0.31                | \$15.50             | 50                           | 0.31                | \$15.50             |
| Phosphorus                      | pound          | 25                            | 0.32                | \$8.00              | 25                           | 0.32                | \$8.00              |
| Potassium                       | poiund         | 75                            | 0.30                | \$22.50             | 75                           | 0.30                | \$22.50             |
| Fungicides                      | acre           | 1                             | 86.24               | \$86.24             | 1                            | 86.24               | \$86.24             |
| Insecticides                    | acre           | 1                             | 38.66               | \$38.66             | 1                            | 57.99               | \$57.99             |
| Herbicides                      | acre           | 1                             | 83.23               | \$83.23             | 1                            | 83.23               | \$83.23             |
| Drip tape                       | feet           | 0                             | 0                   | \$0.00              | 0                            | 0                   | \$0.00              |
| <b>Harvest/Marketing</b>        |                |                               |                     |                     |                              |                     |                     |
| Boxes (30#)                     | each           | 34                            | 3.45                | \$117.30            | 134                          | 3.45                | \$462.30            |
| Bands                           | 100            | 10                            | 1.40                | \$14.00             | 40                           | 1.40                | \$56.00             |
| Marketing (15% of sales)        | 15%            | \$2,500                       | 15%                 | \$375.00            | \$10,000                     | 0.15                | \$1,500.00          |
| <b>Labor</b>                    |                |                               |                     |                     |                              |                     |                     |
| Operator                        | hours          | 2.1                           | 15                  | \$31.50             | 2                            | 15                  | \$30.00             |
| Seasonal                        | hours          | 0                             | 12.5                | \$0.00              | 0                            | 12.5                | \$0.00              |
| Implement                       | hours          | 3.4                           | 12.5                | \$42.50             | 3.4                          | 12.5                | \$42.50             |
| Harvest                         | hours          | 56                            | 12.5                | \$700.00            | 300                          | 12.5                | \$3,750.00          |
| Diesel fuel                     | gallon         | 42.3                          | 2.60                | \$109.98            | 43                           | 2.60                | \$111.80            |
| <b>Repairs and Maintenance</b>  |                |                               |                     |                     |                              |                     |                     |
| Tractors                        | acre           | 1                             | 30.87               | \$30.87             | 1                            | 31.58               | \$31.58             |
| Implements                      | acre           | 1                             | 66.39               | \$66.39             | 1                            | 66.83               | \$66.83             |
| Interest on operating capital   | months         | 6                             | 6%                  | \$42.34             | 6                            | 6%                  | \$168.12            |
| Land                            | acre           | 1                             | 151                 | \$151.00            | 1                            | 151                 | \$151.00            |
| Machinery                       | acre           | 1                             | 216.79              | \$216.79            | 1                            | 219.12              | \$219.12            |
| Food safety inspection          | acre           | 1                             | 250                 | \$250.00            | 1                            | 250                 | \$250.00            |
| <b>Total Costs</b>              |                |                               |                     | <b>\$2,410.00</b>   |                              |                     | <b>\$7,120.91</b>   |
| <b>Returns over Total Costs</b> |                |                               |                     | <b>\$90.00</b>      | <b>\$2,879.09</b>            |                     |                     |

Source: Pennsylvania State University Asparagus Production (<https://extension.psu.edu/asparagus-prod#section-10>) Sample Asparagus Budgets.

**Missouri Blackberry Enterprise Budget – Trickle Irrigation, Fresh Market**

| Revenues, \$/Acre                        | Yield Units | Year 1-Site Preparation |                              |                                | Year 2-Planting Year |                              |                                |
|------------------------------------------|-------------|-------------------------|------------------------------|--------------------------------|----------------------|------------------------------|--------------------------------|
|                                          |             | Yield                   | Sales Price Dollars Per Unit | Gross Returns Dollars Per Acre | Yield                | Sales Price Dollars Per Unit | Gross Returns Dollars Per Acre |
|                                          |             |                         |                              | Per Acre                       |                      |                              | Per Acre                       |
| Fresh Berry Sales*                       | pounds      | 0                       | 2.76                         | \$0.00                         | 0                    | 2.76                         | \$0.00                         |
| <b>Total Revenue</b>                     |             |                         |                              | <b>\$0.00</b>                  |                      |                              | <b>\$0.00</b>                  |
| *Adjusted for 13.4% yield loss           |             |                         |                              |                                |                      |                              |                                |
| Variable Costs, \$/Acre                  | Input Units | Year 1-Site Preparation |                              |                                | Year 2-Planting Year |                              |                                |
|                                          |             | Input Quantity          | Input Price Dollars Per Unit | Cost Dollars Per Acre          | Input Quantity       | Price Dollars Per Unit       | Cost Dollars Per Acre          |
|                                          |             |                         |                              | Per Acre                       |                      |                              | Per Acre                       |
| Plants                                   | plants      | 0                       | 3.35                         | \$0.00                         | 1089                 | 3.35                         | \$3,648.15                     |
| Grass seed                               | pounds      | 0                       | 2.56                         | \$0.00                         | 21                   | 2.56                         | \$53.76                        |
| Soil test                                | soil test   | 1                       | 12.5                         | \$12.50                        | 0                    | 12.5                         | \$0.00                         |
| Straw mulch                              | bales       | 0                       | 4.5                          | \$0.00                         | 218                  | 4.5                          | \$981.00                       |
| <i>Cover crop seed</i>                   |             |                         |                              |                                |                      |                              |                                |
| Oats                                     | bushels     | 2.38                    | 8.47                         | \$20.17                        | 0                    | 8.47                         | \$0.00                         |
| Annual ryegrass                          | pounds      | 30                      | 1.18                         | \$35.40                        | 0                    | 1.18                         | \$0.00                         |
| <i>Fertilizer</i>                        |             |                         |                              |                                |                      |                              |                                |
| Urea                                     | pounds      | 0                       | 0.41                         | \$0.00                         | 100                  | 0.41                         | \$41.00                        |
| Phosphate                                | pounds      | 84                      | 0.315                        | \$26.46                        | 0                    | 0.315                        | \$0.00                         |
| Potash                                   | pounds      | 151.2                   | 0.3                          | \$45.36                        | 0                    | 0.3                          | \$0.00                         |
| Lime                                     | tons        | 0                       | 23                           | \$0.00                         | 0                    | 23                           | \$0.00                         |
| <i>Herbicide</i>                         |             |                         |                              |                                |                      |                              |                                |
| Devironol W                              | pounds      | 0                       | 15.49                        | \$0.00                         | 0                    | 12.35                        | \$0.00                         |
| Princep 90DF                             | pounds      | 0                       | 5.50                         | \$0.00                         | 0                    | 5.7                          | \$0.00                         |
| Surflan AS                               | gallons     | 0                       | 85.58                        | \$0.00                         | 0                    | 48.1                         | \$0.00                         |
| <i>Insecticides</i>                      |             |                         |                              |                                |                      |                              |                                |
| Assail 30SG                              | ounces      | 0                       | 4.06                         | \$0.00                         | 5.3                  | 5.76                         | \$30.53                        |
| Provado 1.6F                             | ounces      | 0                       | 0.93                         | \$0.00                         | 0                    | 0.93                         | \$0.00                         |
| <i>Fungicides</i>                        |             |                         |                              |                                |                      |                              |                                |
| Captan 80W                               | pounds      | 0                       | 4.83                         | \$0.00                         | 0                    | 6.99                         | \$0.00                         |
| Elevate 50WDG                            | pounds      | 0                       | 54.48                        | \$0.00                         | 0                    | 45.55                        | \$0.00                         |
| Lime sulfur                              | gallons     | 0                       | 19.79                        | \$0.00                         | 0                    | 17.86                        | \$0.00                         |
| Pristine 38WDG                           | ounces      | 0                       | 3.29                         | \$0.00                         | 0                    | 3.11                         | \$0.00                         |
| Marketing                                | % of sales  |                         | 10%                          | \$0.00                         |                      | 10%                          | \$0.00                         |
| Drip tape                                | feet        | 0                       | 0.032                        | \$0.00                         | 4368                 | 0.03                         | \$131.04                       |
| Irrigation                               | months      | 0                       | 92.36                        | \$0.00                         | 3                    | 92.36                        | \$277.08                       |
| Plant analysis kit                       | 1 kit       | 0                       | 30                           | \$0.00                         | 0                    | 25                           | \$0.00                         |
| <i>Packaging</i>                         |             |                         |                              |                                |                      |                              |                                |
| Plastic clamshells                       | containers  | 0                       | 0.14                         | \$0.00                         | 0                    | 0.14                         | \$0.00                         |
| Flats                                    | containers  | 0                       | 0.85                         | \$0.00                         | 0                    | 0.85                         | \$0.00                         |
| Refrigeration                            | months      | 0                       | 375                          | \$0.00                         | 0                    | 375                          | \$0.00                         |
| <i>Labor</i>                             |             |                         |                              |                                |                      |                              |                                |
| General labor                            | hours       | 7                       | 12.5                         | \$87.50                        | 72                   | 12.5                         | \$900.00                       |
| Harvest labor                            | hours       | 0.0                     | 12.5                         | \$0.00                         | 0.0                  | 12.5                         | \$0.00                         |
| Other labor                              | hours       | 0                       | 12.5                         | \$0.00                         | 0                    | 12.5                         | \$0.00                         |
| Transportation                           |             |                         |                              | \$0.00                         |                      |                              | \$0.00                         |
| <i>Machinery fuel/repair/maintenance</i> |             |                         |                              |                                |                      |                              |                                |
| Sub-soiler                               | trips       | 0.25                    | 17.06                        | \$4.27                         | 0                    | 17.06                        | \$0.00                         |
| Chisel plow                              | trips       | 1                       | 15.23                        | \$15.23                        | 0                    | 15.23                        | \$0.00                         |
| Tandem disk                              | trips       | 1                       | 12.74                        | \$12.74                        | 0                    | 12.74                        | \$0.00                         |
| Drill                                    | trips       | 1                       | 14.07                        | \$14.07                        | 0                    | 14.07                        | \$0.00                         |
| Disk bed                                 | trips       | 0                       | 12.99                        | \$0.00                         | 1                    | 12.99                        | \$12.99                        |
| Harrow                                   | trips       | 1                       | 8.83                         | \$8.83                         | 1                    | 8.83                         | \$8.83                         |
| Sprayer                                  | trips       | 0                       | 6.17                         | \$0.00                         | 1                    | 6.17                         | \$6.17                         |
| Broadcast seeder                         | trips       | 0                       | 23                           | \$0.00                         | 1                    | 23                           | \$23.00                        |
| Side-dresser                             | trips       | 0                       | 12.25                        | \$0.00                         | 2                    | 12.25                        | \$24.50                        |
| Lime application                         | trips       | 0                       | 9.34                         | \$0.00                         | 0                    | 9.34                         | \$0.00                         |
| Air blast sprayer                        | trips       | 0                       | 28.9                         | \$0.00                         | 3                    | 28.9                         | \$86.70                        |
| Sickle-bar cutter                        | trips       | 0                       | 9.4                          | \$0.00                         | 0                    | 9.4                          | \$0.00                         |
| Mower                                    | trips       | 0                       | 16.38                        | \$0.00                         | 4                    | 16.38                        | \$65.52                        |
| Interest on operating capital            | months      | 6                       | 6%                           | \$8.48                         | 6                    | 6%                           | \$188.71                       |
| Land                                     | acre        | 1                       | 151                          | \$151.00                       | 1                    | 151                          | \$151.00                       |
| Irrigation system                        | acre        | 0                       | 300                          | \$0.00                         | 1                    | 300                          | \$300.00                       |
| <b>Total Costs</b>                       |             |                         |                              | <b>\$442.00</b>                |                      |                              | <b>\$6,929.98</b>              |
| <b>Returns over Total Costs, \$/Acre</b> |             |                         |                              | <b>-\$442.00</b>               |                      |                              | <b>-\$6,929.98</b>             |

**Missouri Blackberry Enterprise Budget – Trickle Irrigation, Fresh Market, (continued)**

|                                   | Yield<br>Units | Year 3-Year After Planting |                     |                     | Years 4-15: Full Production Year |                     |                     |
|-----------------------------------|----------------|----------------------------|---------------------|---------------------|----------------------------------|---------------------|---------------------|
|                                   |                | Yield                      | Sales               |                     | Yield                            | Gross               |                     |
|                                   |                |                            | Price               | Returns             |                                  | Sales Price         | Returns             |
|                                   |                |                            | Dollars<br>Per Unit | Dollars Per<br>Acre |                                  | Dollars Per<br>Unit | Dollars Per<br>Acre |
| Revenues, \$/Acre                 |                |                            |                     |                     |                                  |                     |                     |
| Fresh Berry Sales*                | pounds         | 1650.4                     | 2.76                | \$4,555.05          | 5290.6                           | 2.76                | \$14,602.18         |
| Total Revenue                     |                |                            |                     | \$4,555.05          |                                  |                     | \$14,602.18         |
| *Adjusted for 13.4% yield loss    |                |                            |                     |                     |                                  |                     |                     |
|                                   | Input<br>Units | Year 3-Year After Planting |                     |                     | Years 4-15: Full Production Year |                     |                     |
|                                   |                | Input<br>Quantity          | Input               |                     | Input<br>Quantity                | Input               |                     |
|                                   |                |                            | Price               | Cost                |                                  | Price               | Cost                |
|                                   |                |                            | Dollars<br>Per Unit | Dollars Per<br>Acre |                                  | Dollars Per<br>Unit | Dollars Per<br>Acre |
| Variable Costs, \$/Acre           |                |                            |                     |                     |                                  |                     |                     |
| Plants                            | plants         | 100                        | 3.35                | \$335.00            | 0                                | 3.35                | \$0.00              |
| Grass seed                        | pounds         | 0                          | 2.56                | \$0.00              | 0                                | 2.56                | \$0.00              |
| Soil test                         | soil test      | 0                          | 12.5                | \$0.00              | 0                                | 12.5                | \$0.00              |
| Straw mulch                       | bales          | 0                          | 4.5                 | \$0.00              | 21.8                             | 4.5                 | \$98.10             |
| Cover crop seed                   |                |                            |                     |                     |                                  |                     |                     |
| Oats                              | bushels        | 0                          | 8.47                | \$0.00              | 0                                | 8.47                | \$0.00              |
| Annual ryegrass                   | pounds         | 0                          | 1.18                | \$0.00              | 0                                | 1.18                | \$0.00              |
| Fertilizer                        |                |                            |                     |                     |                                  |                     |                     |
| Urea                              | pounds         | 60                         | 0.41                | \$24.60             | 120                              | 0.41                | \$49.20             |
| Phosphate                         | pounds         | 0                          | 0.315               | \$0.00              | 0                                | 0.315               | \$0.00              |
| Potash                            | pounds         | 0                          | 0.3                 | \$0.00              | 0                                | 0.3                 | \$0.00              |
| Lime                              | tons           | 0                          | 23                  | \$0.00              | 0                                | 23                  | \$0.00              |
| Herbicide                         |                |                            |                     |                     |                                  |                     |                     |
| Devironol W                       | pounds         | 8                          | 12.35               | \$98.80             | 8                                | 12.35               | \$98.80             |
| Princep 90DF                      | pounds         | 2.2                        | 5.7                 | \$12.54             | 4.4                              | 5.7                 | \$25.08             |
| Surflan AS                        | gallons        | 0.5                        | 48.1                | \$24.05             | 0.5                              | 48.1                | \$24.05             |
| Insecticides                      |                |                            |                     |                     |                                  |                     |                     |
| Assail 30SG                       | ounces         | 5.3                        | 5.76                | \$30.53             | 5.3                              | 5.76                | \$30.53             |
| Provado 1.6F                      | ounces         | 8                          | 0.93                | \$7.44              | 8                                | 0.93                | \$7.44              |
| Fungicides                        |                |                            |                     |                     |                                  |                     |                     |
| Captan 80W                        | pounds         | 8                          | 6.99                | \$55.92             | 8                                | 6.99                | \$55.92             |
| Elevate 50WDG                     | pounds         | 3                          | 45.55               | \$136.65            | 3                                | 45.55               | \$136.65            |
| Lime sulfur                       | gallons        | 0                          | 17.86               | \$0.00              | 12                               | 17.86               | \$214.32            |
| Pristine 38WDG                    | ounces         | 0                          | 3.11                | \$0.00              | 20                               | 3.11                | \$62.20             |
| Marketing                         | % of sales     |                            | 10%                 | \$455.50            |                                  | 10%                 | \$1,460.22          |
| Drip tape                         | feet           | 0                          | 0.03                | \$0.00              | 0                                | 0.03                | \$0.00              |
| Irrigation                        | months         | 3                          | 92.36               | \$277.08            | 3                                | 92.36               | \$277.08            |
| Plant analysis kit                | 1 kit          | 1                          | 25                  | \$25.00             | 1                                | 25                  | \$25.00             |
| Packaging                         |                |                            |                     |                     |                                  |                     |                     |
| Plastic clamshells                | containers     | 2201                       | 0.14                | \$308.07            | 7054                             | 0.14                | \$987.59            |
| Flats                             | containers     | 183                        | 0.85                | \$155.87            | 588                              | 0.85                | \$499.67            |
| Refrigeration                     | months         | 1                          | 375                 | \$375.00            | 1                                | 375                 | \$375.00            |
| Labor                             |                |                            |                     |                     |                                  |                     |                     |
| General labor                     | hours          | 43                         | 12.5                | \$537.50            | 55                               | 12.5                | \$687.50            |
| Harvest labor                     | hours          | 71.8                       | 12.5                | \$896.95            | 230.0                            | 12.5                | \$2,875.35          |
| Other labor                       | hours          | 0                          | 12.5                | \$0.00              | 0                                | 12.5                | \$0.00              |
| Transportation                    |                |                            |                     | \$0.00              |                                  |                     | \$0.00              |
| Machinery fuel/repair/maintenance |                |                            |                     |                     |                                  |                     |                     |
| Sub-soiler                        | trips          | 0                          | 17.06               | \$0.00              | 0                                | 17.06               | \$0.00              |
| Chisel plow                       | trips          | 0                          | 15.23               | \$0.00              | 0                                | 15.23               | \$0.00              |
| Tandem disk                       | trips          | 0                          | 12.74               | \$0.00              | 0                                | 12.74               | \$0.00              |
| Drill                             | trips          | 0                          | 14.07               | \$0.00              | 0                                | 14.07               | \$0.00              |
| Disk bed                          | trips          | 0                          | 12.99               | \$0.00              | 0                                | 12.99               | \$0.00              |
| Harrow                            | trips          | 0                          | 8.83                | \$0.00              | 0                                | 8.83                | \$0.00              |
| Sprayer                           | trips          | 2                          | 6.17                | \$12.34             | 2                                | 6.17                | \$12.34             |
| Broadcast seeder                  | trips          | 0                          | 23                  | \$0.00              | 0                                | 23                  | \$0.00              |
| Side-dresser                      | trips          | 2                          | 12.25               | \$24.50             | 2                                | 12.25               | \$24.50             |
| Lime application                  | trips          | 0                          | 9.34                | \$0.00              | 0                                | 9.34                | \$0.00              |
| Air blast sprayer                 | trips          | 8.5                        | 28.9                | \$245.65            | 8.5                              | 28.9                | \$245.65            |
| Sickle-bar cutter                 | trips          | 0                          | 9.4                 | \$0.00              | 0.25                             | 9.4                 | \$2.35              |
| Mower                             | trips          | 4                          | 16.38               | \$65.52             | 4                                | 16.38               | \$65.52             |
| Interest on operating capital     | months         | 6                          | 6%                  | \$123.14            | 6                                | 6%                  | \$250.20            |
| Land                              | acre           | 1                          | 151                 | \$151.00            | 1                                | 151                 | \$151.00            |
| Irrigation system                 | acre           | 1                          | 300                 | \$300.00            | 1                                | 300                 | \$300.00            |
| Total Costs                       |                |                            |                     | \$4,678.64          |                                  |                     | \$9,041.26          |
| Returns over Total Costs, \$/Acre |                |                            |                     | -\$123.60           |                                  |                     | \$5,560.92          |

## Missouri Blueberry Enterprise Budget – Trickle Irrigation, Fresh Market

|                                                                     | Year 1-Site Preparation |                   |                     |                     | Year 2-Planting Year     |                     |                     |
|---------------------------------------------------------------------|-------------------------|-------------------|---------------------|---------------------|--------------------------|---------------------|---------------------|
|                                                                     | Yield<br>Units          | Yield             | Sales Price         | Gross<br>Returns    | Yield<br>Pounds/<br>Acre | Sales<br>Price      | Gross<br>Returns    |
|                                                                     |                         |                   | Dollars Per<br>Unit | Dollars Per<br>Acre |                          | Dollars<br>Per Unit | Dollars Per<br>Acre |
| <b>Revenues, \$/Acre</b>                                            |                         |                   |                     |                     |                          |                     |                     |
| Fresh Berry Sales*                                                  | pounds                  | 0                 | 3.59                | \$0.00              | 0                        | 3.59                | \$0.00              |
| <b>Total Revenue</b>                                                |                         |                   |                     | \$0.00              |                          |                     | \$0.00              |
| *Adjusted for 30% yield loss (15% fruit rot, 5% insects, 10% birds) |                         |                   |                     |                     |                          |                     |                     |
|                                                                     | Year 1-Site Preparation |                   |                     |                     | Year 2-Planting Year     |                     |                     |
|                                                                     | Input<br>Units          | Input<br>Quantity | Input Price         | Cost                | Input<br>Quantity        | Price               | Cost                |
|                                                                     |                         |                   | Dollars Per<br>Unit | Dollars Per<br>Acre |                          | Dollars<br>Per Unit | Dollars Per<br>Acre |
| <b>Variable Costs, \$/Acre</b>                                      |                         |                   |                     |                     |                          |                     |                     |
| Plants                                                              | plants                  | 0                 | 6.2                 | \$0.00              | 1210                     | 6.2                 | \$7,502.00          |
| Grass seed                                                          | pounds                  | 0                 | 2.56                | \$0.00              | 18.5                     | 2.56                | \$47.36             |
| Soil test                                                           | soil test               | 1                 | 12.5                | \$12.50             | 0                        | 12.5                | \$0.00              |
| Peat Moss                                                           | gallons                 | 0                 | 0.75                | \$0.00              | 1815                     | 0.75                | \$1,361.25          |
| Wood Mulch                                                          | cubic yards             | 0                 | 1.67                | \$0.00              | 100                      | 1.67                | \$167.00            |
| <i>Cover crop seed</i>                                              |                         |                   |                     |                     |                          |                     |                     |
| Oats                                                                | bushels                 | 3                 | 8.47                | \$25.42             | 0                        | 8.47                | \$0.00              |
| Annual ryegrass                                                     | pounds                  | 30                | 1.19                | \$35.69             | 0                        | 1.19                | \$0.00              |
| <i>Fertilizer</i>                                                   |                         |                   |                     |                     |                          |                     |                     |
| Nitrogen                                                            | pounds                  | 0                 | 0.31                | \$0.00              | 10                       | 0.31                | \$3.10              |
| Phosphate                                                           | pounds                  | 14                | 0.315               | \$4.41              | 0                        | 0.32                | \$0.00              |
| Potash                                                              | pounds                  | 0                 | 0.3                 | \$0.00              | 0                        | 0.30                | \$0.00              |
| Sulfur                                                              | pounds                  | 2000              | 0.37                | \$740.00            | 0                        | 0.37                | \$0.00              |
| <i>Herbicide</i>                                                    |                         |                   |                     |                     |                          |                     |                     |
| Deviranol W                                                         | pounds                  | 0                 | 15.49               | \$0.00              | 4                        | 15.49               | \$61.95             |
| Princep 90DF                                                        | pounds                  | 0                 | 5.50                | \$0.00              | 2.2                      | 5.50                | \$12.09             |
| Solicam 80DF                                                        | pounds                  | 0                 | 39.50               | \$0.00              | 2.5                      | 39.50               | \$98.74             |
| Poast                                                               | ounces                  | 0                 | 0.84                | \$0.00              | 0                        | 0.84                | \$0.00              |
| Sinbar WDG                                                          | pounds                  | 0                 | 58.59               | \$0.00              | 0                        | 58.59               | \$0.00              |
| Surflan AS                                                          | gallons                 | 0                 | 85.58               | \$0.00              | 0                        | 85.58               | \$0.00              |
| <i>Insecticides</i>                                                 |                         |                   |                     |                     |                          |                     |                     |
| Assail 30SG                                                         | ounces                  | 0                 | 4.06                | \$0.00              | 5.3                      | 4.06                | \$21.53             |
| Provado 1.6F                                                        | ounces                  | 0                 | 0.93                | \$0.00              | 8                        | 0.93                | \$7.44              |
| Imidan 70WSP                                                        | pounds                  | 0                 | 16.99               | \$0.00              | 0                        | 16.99               | \$0.00              |
| Intrepid 2F                                                         | ounces                  | 0                 | 1.95                | \$0.00              | 0                        | 1.95                | \$0.00              |
| Matathion 8F                                                        | gallons                 | 0                 | 47.98               | \$0.00              | 0                        | 47.98               | \$0.00              |
| <i>Fungicides</i>                                                   |                         |                   |                     |                     |                          |                     |                     |
| Captan 80W                                                          | pounds                  | 0                 | 4.83                | \$0.00              | 0                        | 4.83                | \$0.00              |
| Indar 2F                                                            | ounces                  | 0                 | 2.42                | \$0.00              | 0                        | 2.42                | \$0.00              |
| Lime sulfur                                                         | gallons                 | 0                 | 19.79               | \$0.00              | 0                        | 19.79               | \$0.00              |
| Pristine 38WDG                                                      | ounces                  | 0                 | 3.29                | \$0.00              | 0                        | 3.29                | \$0.00              |
| Marketing                                                           | % of sales              | \$0               | 10%                 | \$0.00              | \$0                      | 10%                 | \$0.00              |
| Drip tape                                                           | feet                    | 0                 | 0.032               | \$0.00              | 3550                     | 0.032               | \$113.60            |
| Irrigation                                                          | months                  | 0                 | 41.33               | \$0.00              | 6                        | 41.33               | \$247.98            |
| Pollination                                                         |                         | 0                 | 100                 | \$0.00              | 0                        | 100.00              | \$0.00              |
| Plant analysis kit                                                  | 1 kit                   | 0                 | 30                  | \$0.00              | 0                        | 30.00               | \$0.00              |
| <i>Packaging</i>                                                    |                         |                   |                     |                     |                          |                     |                     |
| Plastic clamshells                                                  | containers              | 0                 | 0.111               | \$0.00              | 0                        | 0.11                | \$0.00              |
| Flats                                                               | containers              | 0                 | 1.26                | \$0.00              | 0                        | 1.26                | \$0.00              |
| Refrigeration                                                       | months                  | 0                 | 375                 | \$0.00              | 0                        | 375                 | \$0.00              |
| <i>Labor</i>                                                        |                         |                   |                     |                     |                          |                     |                     |
| General labor                                                       | hours                   | 7                 | 12.5                | \$87.50             | 56                       | 12.50               | \$700.00            |
| Harvest labor                                                       | hours                   | 0.0               | 12.5                | \$0.00              | 0.0                      | 12.50               | \$0.00              |
| Other labor                                                         | hours                   | 0                 | 12.5                | \$0.00              | 0                        | 12.50               | \$0.00              |
| Transportation                                                      |                         |                   |                     | \$0.00              |                          |                     | \$0.00              |
| <i>Machinery fuel/repair/maintenance</i>                            |                         |                   |                     |                     |                          |                     |                     |
| Fertilizer spreader                                                 | trips                   | 1                 | 5.34                | \$5.34              | 0                        | 5.34                | \$0.00              |
| Disk harrow                                                         | trips                   | 5                 | 12.74               | \$63.70             | 0                        | 12.74               | \$0.00              |
| Chain harrow                                                        | trips                   | 1                 | 8.83                | \$8.83              | 0                        | 8.83                | \$0.00              |
| Sub-soiler                                                          | trips                   | 0.97              | 17.06               | \$16.55             | 0                        | 17.06               | \$0.00              |
| Disk bed                                                            | trips                   | 2                 | 12.99               | \$25.98             | 1                        | 12.99               | \$12.99             |
| Rotary tiller                                                       | trips                   | 2                 | 17.8                | \$35.60             | 0                        | 17.8                | \$0.00              |
| Drill                                                               | trips                   | 1                 | 14.07               | \$14.07             | 0                        | 14.07               | \$0.00              |
| Utility sprayer                                                     | trips                   | 0                 | 14                  | \$0.00              | 5                        | 14                  | \$70.00             |
| Broadcast seeder                                                    | trips                   | 0                 | 23                  | \$0.00              | 1                        | 23                  | \$23.00             |
| Bed shaper                                                          | trips                   | 0                 | 27.87               | \$0.00              | 1                        | 27.87               | \$27.87             |
| Trailer                                                             | trips                   | 1                 | 95                  | \$95.00             | 2                        | 95                  | \$190.00            |
| Front end loader                                                    | trips                   | 1                 | 225                 | \$225.00            | 1                        | 225                 | \$225.00            |
| Rotary cutter                                                       | trips                   | 0                 | 16.38               | \$0.00              | 9                        | 16.38               | \$147.42            |
| Interest on operating capital                                       | months                  | 6                 | 6%                  | \$41.87             | 6                        | 6%                  | \$331.21            |
| Land                                                                | acre                    | 1                 | 151                 | \$151.00            | 1                        | 151.00              | \$151.00            |
| Irrigation system                                                   | acre                    | 0                 | 300                 | \$0.00              | 1                        | 300                 | \$300.00            |
| <b>Total Costs</b>                                                  |                         |                   |                     | \$1,588.46          |                          |                     | \$11,822.52         |
| <b>Returns over Total Costs, \$/Acre</b>                            |                         |                   |                     | -\$1,588.46         |                          |                     | -\$11,822.52        |

## Missouri Blueberry Enterprise Budget – Trickle Irrigation, Fresh Market, (continued)

| Revenues, \$/Acre                                                   | Yield Units | Year 3-Year After Planting |         |                    | Years 4-15: Full Production Year |             |                    |
|---------------------------------------------------------------------|-------------|----------------------------|---------|--------------------|----------------------------------|-------------|--------------------|
|                                                                     |             | Yield                      | Sales   | Gross              | Yield                            | Sales Price | Gross              |
|                                                                     |             |                            | Price   | Returns            |                                  | Dollars Per | Returns            |
|                                                                     |             |                            | Dollars | Dollars Per        |                                  |             | Dollars Per        |
| Fresh Berry Sales*                                                  | pounds      | 0.0                        | 3.59    | \$0.00             | 6352.5                           | 3.59        | \$22,805.48        |
| <b>Total Revenue</b>                                                |             |                            |         | <b>\$0.00</b>      |                                  |             | <b>\$22,805.48</b> |
| *Adjusted for 30% yield loss (15% fruit rot, 5% insects, 10% birds) |             |                            |         |                    |                                  |             |                    |
| Variable Costs, \$/Acre                                             | Input Units | Year 3-Year After Planting |         |                    | Years 4-15: Full Production Year |             |                    |
|                                                                     |             | Input Quantity             | Input   | Cost               | Input Quantity                   | Input Price | Cost               |
|                                                                     |             |                            | Price   | Dollars Per        |                                  | Dollars Per | Dollars Per        |
|                                                                     |             |                            | Dollars | Dollars Per        |                                  | Unit        | Acre               |
| Plants                                                              | plants      | 36                         | 6.2     | \$223.20           | 36                               | 6.2         | \$223.20           |
| Grass seed                                                          | pounds      | 0                          | 2.56    | \$0.00             | 0                                | 2.56        | \$0.00             |
| Soil test                                                           | soil test   | 0                          | 12.5    | \$0.00             | 0                                | 12.5        | \$0.00             |
| Peat Moss                                                           | gallons     | 54                         | 0.75    | \$40.50            | 54                               | 0.75        | \$40.50            |
| Wood Mulch                                                          | cubic yards | 0                          | 1.67    | \$0.00             | 10                               | 1.67        | \$16.70            |
| <i>Cover crop seed</i>                                              |             |                            |         |                    |                                  |             |                    |
| Oats                                                                | bushels     | 0                          | 8.47    | \$0.00             | 0                                | 8.47        | \$0.00             |
| Annual ryegrass                                                     | pounds      | 0                          | 1.19    | \$0.00             | 0                                | 1.19        | \$0.00             |
| <i>Fertilizer</i>                                                   |             |                            |         |                    |                                  |             |                    |
| Nitrogen                                                            | pounds      | 105                        | 0.31    | \$32.55            | 105                              | 0.31        | \$32.55            |
| Phosphate                                                           | pounds      | 0                          | 0.32    | \$0.00             | 0                                | 0.32        | \$0.00             |
| Potash                                                              | pounds      | 0                          | 0.30    | \$0.00             | 0                                | 0.30        | \$0.00             |
| Sulfur                                                              | pounds      | 0                          | 0.37    | \$0.00             | 100                              | 0.37        | \$37.00            |
| <i>Herbicide</i>                                                    |             |                            |         |                    |                                  |             |                    |
| Devronol W                                                          | pounds      | 8                          | 15.49   | \$123.90           | 8                                | 15.49       | \$123.90           |
| Princep 90DF                                                        | pounds      | 4.4                        | 5.50    | \$24.18            | 2.2                              | 5.50        | \$12.09            |
| Solicam 80DF                                                        | pounds      | 0                          | 39.50   | \$0.00             | 0                                | 39.50       | \$0.00             |
| Poast                                                               | ounces      | 32                         | 0.84    | \$27.00            | 0                                | 0.84        | \$0.00             |
| Sinbar WDG                                                          | pounds      | 0                          | 58.59   | \$0.00             | 2                                | 58.59       | \$117.18           |
| Surflan AS                                                          | gallons     | 0                          | 85.58   | \$0.00             | 0.5                              | 85.58       | \$42.79            |
| <i>Insecticides</i>                                                 |             |                            |         |                    |                                  |             |                    |
| Assail 30SG                                                         | ounces      | 5.3                        | 4.06    | \$21.53            | 5.3                              | 4.06        | \$21.53            |
| Provado 1.6F                                                        | ounces      | 8                          | 0.93    | \$7.44             | 0                                | 0.93        | \$0.00             |
| Imidan 70WSP                                                        | pounds      | 0                          | 16.99   | \$0.00             | 1.3                              | 16.99       | \$22.09            |
| Intrepid 2F                                                         | ounces      | 0                          | 1.95    | \$0.00             | 16                               | 1.95        | \$31.13            |
| Matathion 8F                                                        | gallons     | 0                          | 47.98   | \$0.00             | 0.63                             | 47.98       | \$30.23            |
| <i>Fungicides</i>                                                   |             |                            |         |                    |                                  |             |                    |
| Captan 80W                                                          | pounds      | 0                          | 4.83    | \$0.00             | 3                                | 4.83        | \$14.50            |
| Indar 2F                                                            | ounces      | 0                          | 2.42    | \$0.00             | 6                                | 2.42        | \$14.53            |
| Lime sulfur                                                         | gallons     | 5                          | 19.79   | \$98.95            | 5                                | 19.79       | \$98.95            |
| Pristine 38WDG                                                      | ounces      | 0                          | 3.29    | \$0.00             | 40                               | 3.29        | \$131.65           |
| Marketing                                                           | % of sales  | \$0                        | 10%     | \$0.00             | \$22,805                         | 10%         | \$2,280.55         |
| Drip tape                                                           | feet        | 0                          | 0.032   | \$0.00             | 0                                | 0.032       | \$0.00             |
| Irrigation                                                          | months      | 6                          | 41.33   | \$247.98           | 6                                | 41.33       | \$247.98           |
| Pollination                                                         |             | 0                          | 100.00  | \$0.00             | 1                                | 100.00      | \$100.00           |
| Plant analysis kit                                                  | 1 kit       | 0                          | 30.00   | \$0.00             | 1                                | 30.00       | \$30.00            |
| <i>Packaging</i>                                                    |             |                            |         |                    |                                  |             |                    |
| Plastic clamshells                                                  | containers  | 0                          | 0.11    | \$0.00             | 6353                             | 0.11        | \$705.13           |
| Flats                                                               | containers  | 0                          | 1.26    | \$0.00             | 794                              | 1.26        | \$1,000.52         |
| Refrigeration                                                       | months      | 0                          | 375     | \$0.00             | 1                                | 375         | \$375.00           |
| <i>Labor</i>                                                        |             |                            |         |                    |                                  |             |                    |
| General labor                                                       | hours       | 17.5                       | 12.50   | \$218.75           | 20.5                             | 12.50       | \$256.25           |
| Harvest labor                                                       | hours       | 0.0                        | 12.50   | \$0.00             | 254.1                            | 12.50       | \$3,176.25         |
| Other labor                                                         | hours       | 0                          | 12.50   | \$0.00             | 0                                | 12.50       | \$0.00             |
| Transportation                                                      |             |                            |         | \$0.00             |                                  |             | \$0.00             |
| <i>Machinery fuel/repair/maintenance</i>                            |             |                            |         |                    |                                  |             |                    |
| Fertilizer spreader                                                 | trips       | 0                          | 5.34    | \$0.00             | 0                                | 5.34        | \$0.00             |
| Disk harrow                                                         | trips       | 0                          | 12.74   | \$0.00             | 0                                | 12.74       | \$0.00             |
| Chain harrow                                                        | trips       | 0                          | 8.83    | \$0.00             | 0                                | 8.83        | \$0.00             |
| Sub-soiler                                                          | trips       | 0                          | 17.06   | \$0.00             | 0                                | 17.06       | \$0.00             |
| Disk bed                                                            | trips       | 0                          | 12.99   | \$0.00             | 0                                | 12.99       | \$0.00             |
| Rotary tiller                                                       | trips       | 0                          | 17.8    | \$0.00             | 0                                | 17.8        | \$0.00             |
| Drill                                                               | trips       | 0                          | 14.07   | \$0.00             | 0                                | 14.07       | \$0.00             |
| Utility sprayer                                                     | trips       | 7                          | 14      | \$98.00            | 8                                | 14          | \$112.00           |
| Broadcast seeder                                                    | trips       | 0                          | 23      | \$0.00             | 0                                | 23          | \$0.00             |
| Bed shaper                                                          | trips       | 0                          | 27.87   | \$0.00             | 0                                | 27.87       | \$0.00             |
| Trailer                                                             | trips       | 0                          | 95      | \$0.00             | 2                                | 95          | \$190.00           |
| Front end loader                                                    | trips       | 0                          | 225     | \$0.00             | 1                                | 225         | \$225.00           |
| Rotary cutter                                                       | trips       | 12                         | 16.38   | \$196.56           | 12                               | 16.38       | \$196.56           |
| Interest on operating capital                                       | months      | 6                          | 6%      | \$40.82            | 6                                | 6%          | \$297.17           |
| Land                                                                | acre        | 1                          | 151.00  | \$151.00           | 1                                | 151.00      | \$151.00           |
| Irrigation system                                                   | acre        | 1                          | 300     | \$300.00           | 1                                | 300         | \$300.00           |
| <b>Total Costs</b>                                                  |             |                            |         | <b>\$1,852.35</b>  |                                  |             | <b>\$10,653.91</b> |
| <b>Returns over Total Costs, \$/Acre</b>                            |             |                            |         | <b>-\$1,852.35</b> |                                  |             | <b>\$12,151.57</b> |

**Missouri Elderberry Enterprise Budget – Trickle Irrigation, Fresh Market**

|                                 |            | Year 1-Establishment Year |                     |                     | Year 2-First Production Year |                     |                     | Year 3-Second Production Year |                     |                     |
|---------------------------------|------------|---------------------------|---------------------|---------------------|------------------------------|---------------------|---------------------|-------------------------------|---------------------|---------------------|
|                                 |            | Yield<br>Units            | Gross               |                     | Yield                        | Sales               |                     | Yield                         | Gross               |                     |
|                                 |            |                           | Sales Price         | Returns             |                              | Price               | Returns             |                               | Sales Price         | Returns             |
|                                 |            |                           | Dollars Per<br>Unit | Dollars Per<br>Acre |                              | Dollars<br>Per Unit | Dollars Per<br>Acre |                               | Dollars<br>Per Unit | Dollars Per<br>Acre |
| <b>Revenues, \$/Acre</b>        |            |                           |                     |                     |                              |                     |                     |                               |                     |                     |
| Elderberry                      | pounds     | 0                         | 2                   | \$0.00              | 1000                         | 2                   | \$2,000.00          | 1800.0                        | 2                   | \$3,600.00          |
| <b>Total Revenue</b>            |            |                           |                     | \$0.00              |                              |                     | \$2,000.00          |                               |                     | \$3,600.00          |
|                                 |            | Year 1-Establishment Year |                     |                     | Year 2-First Production Year |                     |                     | Year 3-Second Production Year |                     |                     |
|                                 |            | Input<br>Units            | Input               |                     | Input<br>Quantity            | Input               |                     | Input<br>Quantity             | Input               |                     |
|                                 |            |                           | Input Price         | Cost                |                              | Price               | Cost                |                               | Price               | Cost                |
|                                 |            |                           | Dollars Per<br>Unit | Dollars Per<br>Acre |                              | Dollars<br>Per Unit | Dollars Per<br>Acre |                               | Dollars<br>Per Unit | Dollars Per<br>Acre |
| <b>Variable Costs, \$/Acre</b>  |            |                           |                     |                     |                              |                     |                     |                               |                     |                     |
| Cuttings (stems)                | each       | 908                       | 2                   | \$1,816.00          | 0                            | 2.00                | \$0.00              | 0                             | 2.00                | \$0.00              |
| Custom hire                     |            |                           |                     |                     |                              |                     |                     |                               |                     |                     |
| Soil test                       | soil test  | 1                         | 12.5                | \$12.50             | 0                            | 12.50               | \$0.00              | 0                             | 12.50               | \$0.00              |
| Disking                         | times      | 1                         | 29.00               | \$29.00             | 0                            | 29.00               | \$0.00              | 0                             | 29.00               | \$0.00              |
| Mowing                          | times      | 0                         | 50.00               | \$0.00              | 1                            | 50.00               | \$50.00             | 1                             | 50.00               | \$50.00             |
| <b>Fertilizer/lime</b>          |            |                           |                     |                     |                              |                     |                     |                               |                     |                     |
| Nitrogen                        | pound      | 100                       | 0.31                | \$31.00             | 0                            | 0.31                | \$0.00              | 0                             | 0.31                | \$0.00              |
| Compost                         | pound      | 0                         | 280.00              | \$0.00              | 1                            | 280.00              | \$280.00            | 1                             | 280.00              | \$280.00            |
| Herbicide                       | acre       | 1                         | 120.00              | \$120.00            | 1                            | 86.24               | \$86.24             | 1                             | 86.24               | \$86.24             |
| <b>Bed Preparation</b>          |            |                           |                     |                     |                              |                     |                     |                               |                     |                     |
| Mulch                           | cubic yard | 30                        | 20.00               | \$600.00            | 0                            | 20.00               | \$0.00              | 0                             | 20.00               | \$0.00              |
| Drip tape                       | feet       | 7920                      | 0.02                | \$158.40            | 0                            | 0                   | \$0.00              | 0                             | 0                   | \$0.00              |
| <b>Harvest/Marketing</b>        |            |                           |                     |                     |                              |                     |                     |                               |                     |                     |
| Boxes (30#)                     | each       | 0                         | 3.45                | \$0.00              | 17                           | 3.45                | \$58.65             | 34                            | 3.45                | \$117.30            |
| Bands                           | 100        | 0                         | 1.40                | \$0.00              | 5                            | 1.40                | \$7.00              | 10                            | 1.40                | \$14.00             |
| Marketing (15% of sales)        | 15%        | 15%                       | 0.00                | \$0.00              | 15%                          | 2000.00             | \$300.00            | 15%                           | 3600.00             | \$540.00            |
| <b>Labor</b>                    |            |                           |                     |                     |                              |                     |                     |                               |                     |                     |
| Planting/Replacing              | hours      | 40                        | 12.5                | \$500.00            | 10                           | 12.5                | \$125.00            | 2                             | 12.5                | \$25.00             |
| Pruning                         | hours      | 0                         | 12.5                | \$0.00              | 0                            | 12.5                | \$0.00              | 20                            | 12.5                | \$250.00            |
| Harvest                         | hours      | 0                         | 12.5                | \$0.00              | 8                            | 12.5                | \$100.00            | 36                            | 12.5                | \$450.00            |
| <b>Repairs and Maintenance</b>  |            |                           |                     |                     |                              |                     |                     |                               |                     |                     |
| Tractors & Implements           | acre       | 1                         | 150                 | \$150.00            | 1                            | 150                 | \$150.00            | 1                             | 150                 | \$150.00            |
| Interest on operating capital   | months     | 6                         | 6%                  | \$98.01             | 6                            | 6%                  | \$144.61            | 6                             | 6%                  | \$50.44             |
| Land                            | acre       | 1                         | 151                 | \$151.00            | 1                            | 151                 | \$151.00            | 1                             | 151                 | \$151.00            |
| Machinery                       | acre       | 1                         | 213.22              | \$213.22            | 1                            | 219.12              | \$219.12            | 1                             | 216.79              | \$216.79            |
| <b>Total Costs</b>              |            |                           |                     | \$3,879.13          |                              |                     | \$1,671.62          |                               |                     | \$2,380.77          |
| <b>Returns over Total Costs</b> |            |                           |                     | -\$3,879.13         |                              |                     | \$328.38            |                               |                     | \$1,219.23          |

**Missouri Elderberry Enterprise Budget – Trickle Irrigation, Fresh Market (continued)**

| Revenues, \$/Acre    | Yield<br>Units | Year 4-Third Production Year |                     |                     | Year 5-Fourth Production Year |                     |                     |
|----------------------|----------------|------------------------------|---------------------|---------------------|-------------------------------|---------------------|---------------------|
|                      |                | Yield                        | Gross               |                     | Yield                         | Gross               |                     |
|                      |                |                              | Sales Price         | Returns             |                               | Sales Price         | Returns             |
|                      |                |                              | Dollars Per<br>Unit | Dollars Per<br>Acre |                               | Dollars Per<br>Unit | Dollars Per<br>Acre |
| Elderberry           | pounds         | 4500.0                       | 2                   | \$9,000.00          | 6000.0                        | 2                   | \$12,000.00         |
| <b>Total Revenue</b> |                |                              |                     | \$9,000.00          |                               |                     | \$12,000.00         |

| Variable Costs, \$/Acre         | Input<br>Units | Year 4-Third Production Year |                     |                             | Year 5-Fourth Production Year |                     |                             |
|---------------------------------|----------------|------------------------------|---------------------|-----------------------------|-------------------------------|---------------------|-----------------------------|
|                                 |                | Input<br>Quantity            | Input Price         |                             | Input<br>Quantity             | Input Price         |                             |
|                                 |                |                              | Dollars Per<br>Unit | Cost<br>Dollars Per<br>Acre |                               | Dollars Per<br>Unit | Cost<br>Dollars Per<br>Acre |
|                                 |                |                              | Unit                | Acre                        |                               | Unit                | Acre                        |
| Cuttings (stems)                | each           | 0                            | 2.00                | \$0.00                      | 0                             | 2.00                | \$0.00                      |
| Custom hire                     |                |                              |                     |                             |                               |                     |                             |
| Soil test                       | soil test      | 0                            | 12.50               | \$0.00                      | 0                             | 12.50               | \$0.00                      |
| Disking                         | times          | 0                            | 29.00               | \$0.00                      | 0                             | 29.00               | \$0.00                      |
| Mowing                          | times          | 1                            | 50.00               | \$50.00                     | 1                             | 50.00               | \$50.00                     |
| <b>Fertilizer/lime</b>          |                |                              |                     |                             |                               |                     |                             |
| Nitrogen                        | pound          | 0                            | 0.31                | \$0.00                      | 0                             | 0.31                | \$0.00                      |
| Compost                         | pound          | 1                            | 280.00              | \$280.00                    | 1                             | 280.00              | \$280.00                    |
| Herbicide                       | acre           | 1                            | 86.24               | \$86.24                     | 1                             | 86.24               | \$86.24                     |
| <b>Bed Preparation</b>          |                |                              |                     |                             |                               |                     |                             |
| Mulch                           | cubic yard     | 0                            | 20.00               | \$0.00                      | 0                             | 20.00               | \$0.00                      |
| Drip tape                       | feet           | 0                            | 0                   | \$0.00                      | 0                             | 0                   | \$0.00                      |
| <b>Harvest/Marketing</b>        |                |                              |                     |                             |                               |                     |                             |
| Boxes (30#)                     | each           | 134                          | 3.45                | \$462.30                    | 134                           | 3.45                | \$462.30                    |
| Bands                           | 100            | 40                           | 1.40                | \$56.00                     | 40                            | 1.40                | \$56.00                     |
| Marketing (15% of sales)        | 15%            | 15%                          | 9000.00             | \$1,350.00                  | 15%                           | 12000.00            | \$1,800.00                  |
| <b>Labor</b>                    |                |                              |                     |                             |                               |                     |                             |
| Planting/Replacing              | hours          | 2                            | 12.5                | \$25.00                     | 2                             | 12.5                | \$25.00                     |
| Pruning                         | hours          | 20                           | 12.5                | \$250.00                    | 20                            | 12.5                | \$250.00                    |
| Harvest                         | hours          | 100                          | 12.5                | \$1,250.00                  | 100                           | 12.5                | \$1,250.00                  |
| <b>Repairs and Maintenance</b>  |                |                              |                     |                             |                               |                     |                             |
| Tractors & Implements           | acre           | 1                            | 150                 | \$150.00                    | 1                             | 150                 | \$150.00                    |
| Interest on operating capital   | months         | 6                            | 6%                  | \$98.74                     | 6                             | 6%                  | \$112.24                    |
| Land                            | acre           | 1                            | 151                 | \$151.00                    | 1                             | 151                 | \$151.00                    |
| Machinery                       | acre           | 1                            | 219.12              | \$219.12                    | 1                             | 219.12              | \$219.12                    |
| <b>Total Costs</b>              |                |                              |                     | \$4,428.40                  |                               |                     | \$4,891.90                  |
| <b>Returns over Total Costs</b> |                |                              |                     | \$4,571.60                  |                               |                     | \$7,108.10                  |

**Missouri Peach Enterprise Budget – Trickle Irrigation, Fresh Market**

|                   |         | Year 1-Site Preparation |       |                     | Year 2-Planting Year |                     |                     | Years 3 & 4-Growing Years |                     |                     |                     |
|-------------------|---------|-------------------------|-------|---------------------|----------------------|---------------------|---------------------|---------------------------|---------------------|---------------------|---------------------|
|                   |         | Yield<br>Units          | Yield | Gross               | Yield                | Sales               | Gross               | Yield                     | Sales               | Gross               |                     |
|                   |         |                         |       | Sales Price         |                      | Returns             | Price               |                           | Returns             | Price               | Returns             |
|                   |         |                         |       | Dollars Per<br>Unit |                      | Dollars<br>Per Acre | Dollars<br>Per Unit |                           | Dollars Per<br>Acre | Dollars<br>Per Unit | Dollars Per<br>Acre |
| Revenues, \$/Acre |         |                         |       |                     |                      |                     |                     |                           |                     |                     |                     |
| Fresh Peach Sales | bushels | 0                       | 30    | \$0.00              | 0                    | 30                  | \$0.00              | 0.0                       | 30                  | \$0.00              |                     |
| Total Revenue     |         |                         |       | \$0.00              |                      |                     | \$0.00              |                           |                     | \$0.00              |                     |

|                                      |              | Year 1-Site Preparation |                   |                     | Year 2-Planting Year |                     |                     | Years 3 & 4-Growing Years |                     |                     |                     |
|--------------------------------------|--------------|-------------------------|-------------------|---------------------|----------------------|---------------------|---------------------|---------------------------|---------------------|---------------------|---------------------|
|                                      |              | Input<br>Units          | Input<br>Quantity | Input Price         | Input<br>Quantity    | Price               | Cost                | Input<br>Quantity         | Price               | Cost                |                     |
|                                      |              |                         |                   | Dollars Per<br>Unit |                      | Dollars<br>Per Acre | Dollars<br>Per Unit |                           | Dollars Per<br>Acre | Dollars<br>Per Unit | Dollars Per<br>Acre |
|                                      |              |                         |                   | Per Acre            |                      |                     |                     |                           |                     |                     |                     |
| Variable Costs, \$/Acre              |              |                         |                   |                     |                      |                     |                     |                           |                     |                     |                     |
| Preharvest Costs                     |              |                         |                   |                     |                      |                     |                     |                           |                     |                     |                     |
| Peach Trees                          | plants       | 0                       | 6                 | \$0.00              | 110                  | 6                   | \$660.00            | 0                         | 6                   | \$0.00              |                     |
| Grass seed                           | pounds       | 15                      | 2.56              | \$38.40             | 0                    | 2.56                | \$0.00              | 0                         | 2.56                | \$0.00              |                     |
| Soil test                            | soil test    | 2                       | 12.5              | \$25.00             | 0                    | 12.5                | \$0.00              | 0                         | 12.5                | \$0.00              |                     |
| Fertilizer & Lime                    | acre         | 1                       | 143.8             | \$143.80            | 1                    | 47.3                | \$47.30             | 1                         | 87.3                | \$87.30             |                     |
| Herbicide                            | acre         | 1                       | 18                | \$18.00             | 1                    | 93.8                | \$93.80             | 1                         | 111.9               | \$111.90            |                     |
| Insecticides                         | acre         | 0                       | 0                 | \$0.00              | 1                    | 54.8                | \$54.80             | 1                         | 54.8                | \$54.80             |                     |
| Fungicides                           | acre         | 0                       | 0                 | \$0.00              | 1                    | 70.5                | \$70.50             | 1                         | 70.5                | \$70.50             |                     |
| Drip tape                            | feet         | 0                       | 0.032             | \$0.00              | 7749                 | 0.032               | \$247.98            | 0                         | 0.032               | \$0.00              |                     |
| Tree Guards                          |              | 0                       | 1.2               | \$0.00              | 110                  | 1.2                 | \$132.00            | 0                         | 1.2                 | \$0.00              |                     |
| Plant analysis kit                   | 1 kit        | 0                       | 30                | \$0.00              | 0                    | 30                  | \$0.00              | 0                         | 30                  | \$0.00              |                     |
| Irrigation                           | months       | 0                       | 41.33             | \$0.00              | 0                    | 41.33               | \$0.00              | 0                         | 41.33               | \$0.00              |                     |
| Pollination                          | months       | 0                       | 100               | \$0.00              | 0                    | 100                 | \$0.00              | 0                         | 100                 | \$0.00              |                     |
| General labor                        | hours        | 0                       | 12.5              | \$0.00              | 20                   | 12.5                | \$250.00            | 18                        | 12.5                | \$225.00            |                     |
| Machinery fuel/repair/maintenance    | acre         | 1                       | 37.75             | \$37.75             | 1                    | 89.83               | \$89.83             | 1                         | 17.34               | \$17.34             |                     |
| Interest on operating capital        | months       | 6                       | 6%                | \$7.89              | 6                    | 6%                  | \$49.39             | 6                         | 6%                  | \$17.01             |                     |
| Harvest Costs                        |              |                         |                   |                     |                      |                     |                     |                           |                     |                     |                     |
| Operator Labor                       | hours        | 2.0                     | 15                | \$30.00             | 11.5                 | 15                  | \$171.75            | 12.0                      | 15                  | \$180.00            |                     |
| Harvest labor                        | hours        | 0                       | 12.5              | \$0.00              | 0                    | 12.5                | \$0.00              | 0                         | 12.5                | \$0.00              |                     |
| Bags                                 | containers   | 0                       | 0.065             | \$0.00              | 0                    | 0.065               | \$0.00              | 0                         | 0.065               | \$0.00              |                     |
| Marketing Costs                      | 10% of gross | 0                       | 10%               | \$0.00              | 0                    | 10%                 | \$0.00              | 0                         | 10%                 | \$0.00              |                     |
| Refrigeration                        | day          | 0                       | 1.22              | \$0.00              | 0                    | 1.22                | \$0.00              | 0                         | 1.22                | \$0.00              |                     |
| Total Variable Costs                 |              |                         |                   | \$300.84            | \$1,867.35           |                     |                     | \$763.85                  |                     |                     |                     |
| Fixed Costs                          |              |                         |                   |                     |                      |                     |                     |                           |                     |                     |                     |
| Land                                 | acre         | 1                       | 151               | \$151.00            | 1                    | 151                 | \$151.00            | 1                         | 151                 | \$151.00            |                     |
| Irrigation                           | acre         | 0                       | 257.14            | \$0.00              | 1                    | 257.14              | \$257.14            | 1                         | 257.14              | \$257.14            |                     |
| Fixed Cost on Refrigeration System   | year         | 0                       | 550               | \$0.00              | 0                    | 550                 | \$0.00              | 0                         | 550                 | \$0.00              |                     |
| Machinery & Equipment                | acre         | 1                       | 34.74             | \$34.74             | 1                    | 30.11               | \$30.11             | 1                         | 23.74               | \$23.74             |                     |
| Total Fixed Costs                    |              |                         |                   | \$185.74            | \$438.25             |                     |                     | \$431.88                  |                     |                     |                     |
| Total Costs Including Operator Labor |              |                         |                   | \$486.58            | \$2,305.60           |                     |                     | \$1,195.73                |                     |                     |                     |
| Returns over Total Costs, \$/Acre    |              |                         |                   | -\$486.58           | -\$2,305.60          |                     |                     | -\$1,195.73               |                     |                     |                     |

**Missouri Peach Enterprise Budget – Trickle Irrigation, Fresh Market, (continued)**

| Revenues, \$/Acre                    | Yield<br>Units | Year 5 First Bearing Year |                     |                             | Year 6 Second Bearing Year |                     |                             | Year 7 Third Bearing Year |                     |                             |
|--------------------------------------|----------------|---------------------------|---------------------|-----------------------------|----------------------------|---------------------|-----------------------------|---------------------------|---------------------|-----------------------------|
|                                      |                | Yield                     | Gross               |                             | Yield                      | Gross               |                             | Yield                     | Gross               |                             |
|                                      |                |                           | Sales Price         | Returns                     |                            | Sales Price         | Returns                     |                           | Sales Price         | Returns                     |
|                                      |                |                           | Dollars Per<br>Unit | Dollars Per<br>Acre         |                            | Dollars Per<br>Unit | Dollars Per<br>Acre         |                           | Dollars Per<br>Unit | Dollars Per<br>Acre         |
| Fresh Peach Sales                    | bushels        | 100.0                     | 30                  | \$3,000.00                  | 200.0                      | 30                  | \$6,000.00                  | 300.0                     | 30                  | \$9,000.00                  |
| Total Revenue                        |                |                           |                     | \$3,000.00                  |                            |                     | \$6,000.00                  |                           |                     | \$9,000.00                  |
| Variable Costs, \$/Acre              | Input<br>Units | Year 5 First Bearing Year |                     |                             | Year 6 Second Bearing Year |                     |                             | Year 7 Third Bearing Year |                     |                             |
|                                      |                | Input<br>Quantity         | Input Price         |                             | Input<br>Quantity          | Input Price         |                             | Input<br>Quantity         | Input Price         |                             |
|                                      |                |                           | Dollars Per<br>Unit | Cost<br>Dollars Per<br>Acre |                            | Dollars Per<br>Unit | Cost<br>Dollars Per<br>Acre |                           | Dollars Per<br>Unit | Cost<br>Dollars Per<br>Acre |
|                                      |                |                           | Dollars Per<br>Unit | Cost<br>Dollars Per<br>Acre |                            | Dollars Per<br>Unit | Cost<br>Dollars Per<br>Acre |                           | Dollars Per<br>Unit | Cost<br>Dollars Per<br>Acre |
| Preharvest Costs                     |                |                           |                     |                             |                            |                     |                             |                           |                     |                             |
| Peach Trees                          | plants         | 0                         | 6                   | \$0.00                      | 0                          | 6                   | \$0.00                      | 0                         | 6                   | \$0.00                      |
| Grass seed                           | pounds         | 0                         | 2.56                | \$0.00                      | 0                          | 2.56                | \$0.00                      | 0                         | 2.56                | \$0.00                      |
| Soil test                            | soil test      | 0                         | 12.5                | \$0.00                      | 0                          | 12.5                | \$0.00                      | 0                         | 12.5                | \$0.00                      |
| Fertilizer & Lime                    | acre           | 1                         | 132                 | \$132.00                    | 1                          | 176                 | \$176.00                    | 1                         | 220                 | \$220.00                    |
| Herbicide                            | acre           | 1                         | 124                 | \$124.00                    | 1                          | 124                 | \$124.00                    | 1                         | 124                 | \$124.00                    |
| Insecticides                         | acre           | 1                         | 184.11              | \$184.11                    | 1                          | 184.11              | \$184.11                    | 1                         | 184.11              | \$184.11                    |
| Fungicides                           | acre           | 1                         | 349.22              | \$349.22                    | 1                          | 349.22              | \$349.22                    | 1                         | 349.22              | \$349.22                    |
| Drip tape                            | feet           | 0                         | 0.032               | \$0.00                      | 0                          | 0.032               | \$0.00                      | 0                         | 0.032               | \$0.00                      |
| Tree Guards                          |                | 0                         | 1.2                 | \$0.00                      | 0                          | 1.2                 | \$0.00                      | 0                         | 1.2                 | \$0.00                      |
| Plant analysis kit                   | 1 kit          | 0                         | 30                  | \$0.00                      | 0                          | 30                  | \$0.00                      | 0                         | 30                  | \$0.00                      |
| Irrigation                           | months         | 5                         | 41.33               | \$206.65                    | 5                          | 41.33               | \$206.65                    | 5                         | 41.33               | \$206.65                    |
| Pollination                          | months         | 1                         | 100                 | \$100.00                    | 1                          | 100                 | \$100.00                    | 1                         | 100                 | \$100.00                    |
| General labor                        | hours          | 5                         | 12.5                | \$62.50                     | 5                          | 12.5                | \$62.50                     | 5                         | 12.5                | \$62.50                     |
| Machinery fuel/repair/maintenance    | acre           | 1                         | 33.59               | \$33.59                     | 1                          | 33.59               | \$33.59                     | 1                         | 33.59               | \$33.59                     |
| Interest on operating capital        | months         | 6                         | 6%                  | \$35.76                     | 6                          | 6%                  | \$37.08                     | 6                         | 6%                  | \$38.40                     |
| Harvest Costs                        |                |                           |                     |                             |                            |                     |                             |                           |                     |                             |
| Operator Labor                       | hours          | 64.75                     | 15                  | \$971.25                    | 76.8                       | 15                  | \$1,151.25                  | 76.8                      | 15                  | \$1,151.25                  |
| Harvest labor                        | hours          | 20                        | 12.5                | \$250.00                    | 40                         | 12.5                | \$500.00                    | 60                        | 12.5                | \$750.00                    |
| Bags                                 | containers     | 800                       | 0.065               | \$52.00                     | 1600                       | 0.065               | \$104.00                    | 2400                      | 0.065               | \$156.00                    |
| Marketing Costs                      | 10% of gros    | 3000                      | 10%                 | \$300.00                    | 6000                       | 10%                 | \$600.00                    | 9000                      | 10%                 | \$900.00                    |
| Refrigeration                        | day            | 30                        | 1.22                | \$36.60                     | 30                         | 1.22                | \$36.60                     | 30                        | 1.22                | \$36.60                     |
| Total Variable Costs                 |                |                           |                     | \$2,837.68                  |                            |                     | \$3,665.00                  |                           |                     | \$4,312.32                  |
| Fixed Costs                          |                |                           |                     |                             |                            |                     |                             |                           |                     |                             |
| Land                                 | acre           | 1                         | 151                 | \$151.00                    | 1                          | 151                 | \$151.00                    | 1                         | 151                 | \$151.00                    |
| Irrigation                           | acre           | 1                         | 257.14              | \$257.14                    | 1                          | 257.14              | \$257.14                    | 1                         | 257.14              | \$257.14                    |
| Fixed Cost on Refrigeration System   | year           | 1                         | 550                 | \$550.00                    | 1                          | 550                 | \$550.00                    | 1                         | 550                 | \$550.00                    |
| Machinery & Equipment                | acre           | 1                         | 42.85               | \$42.85                     | 1                          | 42.85               | \$42.85                     | 1                         | 42.85               | \$42.85                     |
| Total Fixed Costs                    |                |                           |                     | \$1,000.99                  |                            |                     | \$1,000.99                  |                           |                     | \$1,000.99                  |
| Total Costs Including Operator Labor |                |                           |                     | \$3,838.67                  |                            |                     |                             |                           | \$4,665.99          | \$5,313.31                  |
| Returns over Total Costs, \$/Acre    |                |                           |                     | -\$838.67                   |                            |                     |                             |                           | \$1,334.01          | \$3,686.69                  |

**Missouri Strawberry Enterprise Budget – Trickle Irrigation, Fresh Market**

|                                   |             | Year 1-Establishment Year |                   |                                    | Year 2-First Production Year   |                   |                              |                                |
|-----------------------------------|-------------|---------------------------|-------------------|------------------------------------|--------------------------------|-------------------|------------------------------|--------------------------------|
|                                   |             | Yield<br>Units            | Yield             | Gross                              |                                | Yield             | Sales                        |                                |
|                                   |             |                           |                   | Sales Price<br>Dollars Per<br>Unit | Returns<br>Dollars Per<br>Acre |                   | Price<br>Dollars<br>Per Unit | Returns<br>Dollars Per<br>Acre |
|                                   |             |                           |                   |                                    |                                |                   |                              |                                |
| Revenues, \$/Acre                 |             |                           |                   |                                    |                                |                   |                              |                                |
| Fresh Berry Sales                 | quarts      | 0                         | 4.5               | \$0.00                             | 4000                           | 4.5               | \$18,000.00                  |                                |
| Total Revenue                     |             |                           |                   | \$0.00                             |                                |                   | \$18,000.00                  |                                |
|                                   |             | Year 1-Establishment Year |                   |                                    | Year 2-First Production Year   |                   |                              |                                |
|                                   |             | Input<br>Units            | Input<br>Quantity | Input Price                        |                                | Input<br>Quantity | Input Price                  |                                |
|                                   |             |                           |                   | Dollars Per<br>Unit                | Cost<br>Dollars Per<br>Acre    |                   | Dollars<br>Per Unit          | Cost<br>Dollars Per<br>Acre    |
|                                   |             |                           |                   |                                    |                                |                   |                              |                                |
| Variable Costs, \$/Acre           |             |                           |                   |                                    |                                |                   |                              |                                |
| Plants                            | plants      | 5000                      | 0.15              | \$750.00                           | 0                              | 0.15              | \$0.00                       |                                |
| Grass seed                        | pounds      | 0                         | 2.56              | \$0.00                             | 0                              | 2.56              | \$0.00                       |                                |
| Soil test                         | soil test   | 0                         | 12.5              | \$0.00                             | 0                              | 12.50             | \$0.00                       |                                |
| Straw mulch                       | large round | 7                         | 37                | \$259.00                           | 7                              | 37.00             | \$259.00                     |                                |
| Cover crop seed                   | pounds      | 30                        | 1.19              | \$35.69                            | 0                              | 1.19              | \$0.00                       |                                |
| Fertilizer                        |             | 150                       | 0.52              | \$78.00                            | 300                            | 0.2               | 60                           |                                |
| Pesticides                        |             |                           |                   |                                    | 1                              | 100               | 100                          |                                |
| Drip and Overhead                 | feet        |                           |                   | \$1,500.00                         | 0                              | 0                 | \$0.00                       |                                |
| Packaging                         |             |                           |                   |                                    |                                |                   |                              |                                |
| Containers                        | containers  | 0                         | 0.11              | \$0.00                             | 1000                           | 0.11              | \$110.77                     |                                |
| Trays for u-pick                  | containers  | 0                         | 1.26              | \$0.00                             | 100                            | 1.26              | \$126.00                     |                                |
| Labor                             |             |                           |                   |                                    |                                |                   |                              |                                |
| Cover crop                        | hours       | 3                         | 12.5              | \$37.50                            | 0                              | 12.5              | \$0.00                       |                                |
| Land preparation - trench         | hours       | 1                         | 12.5              | \$12.50                            | 0                              | 12.5              | \$0.00                       |                                |
| Remove mulch                      | hours       | 0                         | 12.5              | \$0.00                             | 8                              | 12.5              | \$100.00                     |                                |
| Fertilizer spreading              | hours       | 1                         | 12.5              | \$12.50                            | 1                              | 12.5              | \$12.50                      |                                |
| Transplanting                     | hours       | 18                        | 12.5              | \$225.00                           | 0                              | 12.5              | \$0.00                       |                                |
| Hand hoeing                       | hours       | 90                        | 12.5              | \$1,125.00                         | 30                             | 12.5              | \$375.00                     |                                |
| Mowing                            | hours       | 0                         | 12.5              | \$0.00                             | 1                              | 12.5              | \$12.50                      |                                |
| Renovation                        | hours       | 0                         | 12.5              | \$0.00                             | 4                              | 12.5              | \$50.00                      |                                |
| Remove blossoms                   | hours       | 4                         | 12.5              | \$50.00                            | 0                              | 12.5              | \$0.00                       |                                |
| Mulching                          | hours       | 16                        | 12.5              | \$200.00                           | 16                             | 12.5              | \$200.00                     |                                |
| Irrigation set up - drip/overhead | hours       | 20                        | 12.5              | \$250.00                           | 0                              | 12.5              | \$0.00                       |                                |
| Irrigation tear down & setup      | hours       | 0                         | 12.5              | \$0.00                             | 2                              | 12.5              | \$25.00                      |                                |
| Pest Management                   | hours       | 0                         | 12.5              | \$0.00                             | 4                              | 12.5              | \$50.00                      |                                |
| Harvest labor                     | per quart   | 0.0                       | 1                 | \$0.00                             | 1000.0                         | 1                 | \$1,000.00                   |                                |
| Extra weed control                | hours       | 0                         | 12.5              | \$0.00                             | 0                              | 12.5              | \$0.00                       |                                |
| Transportation                    |             |                           |                   | \$0.00                             |                                |                   | \$0.00                       |                                |
| Interest on operating capital     | months      | 12                        | 6%                | \$272.11                           | 12                             | 6%                | \$432.14                     |                                |
|                                   |             |                           |                   |                                    |                                |                   |                              |                                |
| Land                              | acre        | 1                         | 151               | \$151.00                           | 1                              | 151               | \$151.00                     |                                |
| Machinery                         | acre        | 1                         | 500               | \$500.00                           | 1                              | 500               | \$500.00                     |                                |
| Irrigation system                 | acre        | 1                         | 500               | \$500.00                           | 1                              | 500               | \$500.00                     |                                |
| Total Costs                       |             |                           |                   | \$5,958.30                         |                                |                   | \$4,063.91                   |                                |
| Returns over Total Costs, \$/Acre |             |                           |                   | -\$5,958.30                        |                                | \$13,936.09       |                              |                                |

**Missouri Strawberry Enterprise Budget – Trickle Irrigation, Fresh Market, (continued)**

|                          | Year 3-Second Production Year |             |             | Year 4-Third Production Year |             |            |
|--------------------------|-------------------------------|-------------|-------------|------------------------------|-------------|------------|
|                          | Gross                         |             |             | Gross                        |             |            |
|                          | Sales Price                   |             | Returns     | Sales Price                  |             | Returns    |
|                          | Dollars                       | Dollars Per |             | Dollars Per                  | Dollars Per |            |
| <b>Revenues, \$/Acre</b> | Yield                         | Per Unit    | Acre        | Yield                        | Unit        | Acre       |
| Fresh Berry Sales        | 3000.0                        | 4.5         | \$13,500.00 | 2000.0                       | 4.5         | \$9,000.00 |
| <b>Total Revenue</b>     |                               |             | \$13,500.00 |                              |             | \$9,000.00 |

|                                          | Year 3-Second Production Year |          |             | Year 4-Third Production Year |             |             |
|------------------------------------------|-------------------------------|----------|-------------|------------------------------|-------------|-------------|
|                                          | Input                         |          |             |                              |             |             |
|                                          | Price                         |          | Cost        | Input Price                  |             | Cost        |
|                                          | Input                         | Dollars  | Dollars Per | Input                        | Dollars Per | Dollars Per |
| <b>Variable Costs, \$/Acre</b>           | Quantity                      | Per Unit | Acre        | Quantity                     | Unit        | Acre        |
| Plants                                   | 0                             | 0.15     | \$0.00      | 0                            | 0.15        | \$0.00      |
| Grass seed                               | 0                             | 2.56     | \$0.00      | 0                            | 2.56        | \$0.00      |
| Soil test                                | 0                             | 12.50    | \$0.00      | 0                            | 12.50       | \$0.00      |
| Straw mulch                              | 7                             | 37.00    | \$259.00    | 7                            | 37.00       | \$259.00    |
| Cover crop seed                          | 0                             | 1.19     | \$0.00      | 0                            | 1.19        | \$0.00      |
| Fertilizer                               | 300                           | 0.2      | \$60.00     | 300                          | 0.2         | \$60.00     |
| Pesticides                               | 1                             | 100      | \$100.00    | 1                            | 100         | \$100.00    |
| Drip and Overhead                        | 0                             | 0        | \$0.00      | 0                            | 0           | \$0.00      |
| <b>Packaging</b>                         |                               |          |             |                              |             |             |
| Containers                               | 1000                          | 0.11     | \$110.77    | 1000                         | 0.11        | \$110.77    |
| Trays for u-pick                         | 75                            | 1.26     | \$94.50     | 50                           | 1.26        | \$63.00     |
| <b>Labor</b>                             |                               |          |             |                              |             |             |
| Cover crop                               | 0                             | 12.5     | \$0.00      | 0                            | 12.5        | \$0.00      |
| Land preparation - trench                | 0                             | 12.5     | \$0.00      | 0                            | 12.5        | \$0.00      |
| Remove mulch                             | 8                             | 12.5     | \$100.00    | 8                            | 12.5        | \$100.00    |
| Fertilizer spreading                     | 1                             | 12.5     | \$12.50     | 1                            | 12.5        | \$12.50     |
| Transplanting                            | 0                             | 12.5     | \$0.00      | 0                            | 12.5        | \$0.00      |
| Hand hoeing                              | 30                            | 12.5     | \$375.00    | 30                           | 12.5        | \$375.00    |
| Mowing                                   | 1                             | 12.5     | \$12.50     | 1                            | 12.5        | \$12.50     |
| Renovation                               | 4                             | 12.5     | \$50.00     | 4                            | 12.5        | \$50.00     |
| Remove blossoms                          | 0                             | 12.5     | \$0.00      | 0                            | 12.5        | \$0.00      |
| Mulching                                 | 16                            | 12.5     | \$200.00    | 16                           | 12.5        | \$200.00    |
| Irrigation set up - drip/overhead        | 0                             | 12.5     | \$0.00      | 0                            | 12.5        | \$0.00      |
| Irrigation tear down & setup             | 2                             | 12.5     | \$25.00     | 2                            | 12.5        | \$25.00     |
| Pest Management                          | 4                             | 12.5     | \$50.00     | 4                            | 12.5        | \$50.00     |
| Harvest labor                            | 1000.0                        | 1        | \$1,000.00  | 1000.0                       | 1           | \$1,000.00  |
| Extra weed control                       | 10.0                          | 12.5     | \$125.00    | 15.0                         | 12.5        | \$187.50    |
| Transportation                           |                               |          | \$0.00      |                              |             | \$0.00      |
| Interest on operating capital            | 12                            | 6%       | \$82.14     | 12                           | 6%          | \$85.89     |
| Land                                     | 1                             | 151      | \$151.00    | 1                            | 151         | \$151.00    |
| Machinery                                | 1                             | 500      | \$500.00    | 1                            | 500         | \$500.00    |
| Irrigation system                        | 1                             | 500      | \$500.00    | 1                            | 500         | \$500.00    |
| <b>Total Costs</b>                       |                               |          | \$3,807.41  |                              |             | \$3,842.16  |
| <b>Returns over Total Costs, \$/Acre</b> |                               |          | \$9,692.59  |                              |             | \$5,157.84  |

## High Tunnel Crops

As you utilize these budgets you should always begin by customizing the budget to your farm. Your operation may have important differences in soil fertility, pests, irrigation, labor, etc. These budgets provide a benchmark from which to start but are really only the beginning of developing sound financial budgets for your operation. While we do not discuss each crop's budget in detail, you are welcome to contact us with questions, corrections, additional details, and comments.

For high tunnel crops, the enterprise budgets present the cost and returns for a 2000 square foot high tunnel. The last column of each table also presents the costs per square foot in order to make it easier for you to estimate costs specific to the size of your high tunnel. The cost per month of the high tunnel is based on the high tunnel cost reported earlier in this report (page High tunnels: A game changer for Missouri fruit and vegetable production<sup>18</sup>).

At the top of each budget, the yield and price of the specialty crop budget is listed. These budgets are entirely based on high tunnel budgets produced at Kansas State University. Sales prices are taken from the Central Missouri Produce Auction if they have a representative price for the commodity.

Variable costs are based on the quantity of inputs multiplied by the price. The input quantities are based on surrounding states and prices were cross referenced with price reported by various input suppliers via the internet. Labor rates have been assumed to be \$12.50 per hour for hired labor and \$15.00 per hour for operator labor across all budgets. Marketing costs are generally report as a percentage of sales. They are based on the specialty commodity but generally average around 10% of sales. These costs are incurred in various ways with the most obvious example being commissions charged by auction markets or brokers. In Farmers' Markets, these costs are reflected in hours spent at the market directly selling to customers as well as promotional materials.

Land costs are based on average rental rates reported in Extension budgets for Missouri. Machinery and irrigation fixed cost are based on reported rates from surrounding states.

At the bottom of each budget, the returns over total costs are reported. These returns are calculated as total revenue less total variable and fixed costs.

**Missouri High Tunnel Colored Bell Peppers Enterprise Budget, Fresh Market**

|                                                   |             |                | Sales Price Dollars            | Gross Returns                 |             |
|---------------------------------------------------|-------------|----------------|--------------------------------|-------------------------------|-------------|
| Revenue, \$/2000 Square Feet                      | Yield Units | Yield          | Per Unit*                      | \$/2000 sq ft                 | \$/sq. foot |
| Bell Peppers                                      | lbs         | 3072           | \$1.39                         | \$4,270.08                    | \$2.30      |
| Total Revenue                                     |             |                |                                | \$4,270.08                    |             |
|                                                   |             |                | Input Price (Dollars Per Unit) | Total Material and Labor Cost | \$/sq. foot |
| Costs, \$/2000 Square Feet                        | Input Units | Input Quantity |                                |                               |             |
| Variable Costs                                    |             |                |                                |                               |             |
| Soil test                                         | each        | 1              | \$12.50                        | \$12.50                       | \$0.01      |
| Fertilizer (Compost)                              | ton         | 6              | \$5.00                         | \$30.00                       | \$0.02      |
| Fertilizer spreading -hired labor                 | hours       | 3              | \$12.50                        | \$37.50                       | \$0.02      |
| Tilling                                           | hours       | 1              | \$12.50                        | \$12.50                       | \$0.01      |
| Lay beds - hired labor                            | hours       | 3              | \$12.50                        | \$37.50                       | \$0.02      |
| Plastic mulch                                     | feet        | 400            | \$0.03                         | \$13.12                       | \$0.01      |
| Drip tape                                         | feet        | 400            | \$0.03                         | \$12.69                       | \$0.01      |
| Transplants                                       | each        | 512            | \$0.27                         | \$138.24                      | \$0.07      |
| Planting - hired labor                            | hours       | 3              | \$12.50                        | \$37.50                       | \$0.02      |
| Stakes                                            | each        | 512            | \$0.20                         | \$104.00                      | \$0.05      |
| Staking - hired labor                             | hours       | 12             | \$12.50                        | \$150.00                      | \$0.08      |
| Weeding - hired labor                             | hours       | 4              | \$12.50                        | \$50.00                       | \$0.03      |
| Irrigation (setup and maint)                      | hours       | 4              | \$12.50                        | \$50.00                       | \$0.03      |
| Fertigation                                       | Fertilizer  | 1              | \$37.00                        | \$37.00                       | \$0.02      |
| Fertigation - hired labor                         | hours       | 2              | \$12.50                        | \$25.00                       | \$0.01      |
| IPM                                               | Insecticide | 1              | \$119.00                       | \$119.00                      | \$0.06      |
| IPM (scouting/application) - hired labor          | hours       | 12             | \$12.50                        | \$150.00                      | \$0.08      |
| Harvesting (12 weeks) - hired labor               | hours       | 48             | \$12.50                        | \$600.00                      | \$0.30      |
| Washing/grading/ packing (12 weeks) - hired labor | hours       | 48             | \$12.50                        | \$600.00                      | \$0.30      |
| Boxes and other supplies - hired labor            | hours       | 4              | \$12.50                        | \$50.00                       | \$0.03      |
| Utilities/storage                                 |             |                |                                | \$0.00                        | \$0.00      |
| Marketing                                         |             |                |                                |                               |             |
| Owner Labor - farmers' markets (1/3 of stand)     | hours       | 20             | \$15.00                        | \$300.00                      | \$0.15      |
| Farmers' market stand (1/3 of stand)              | stand       | 0.333          | \$260.00                       | \$86.67                       | \$0.04      |
| Marketing materials (1/3 of stand)                | season      | 0.333          | \$500.00                       | \$166.67                      | \$0.08      |
| Fixed Costs                                       |             |                |                                |                               |             |
| High tunnel building use                          | months      | 4              | \$110.22                       | \$440.87                      | \$0.22      |
| Total Cost                                        |             |                |                                | \$3,260.75                    | \$1.63      |
| Returns over Total Costs, \$/2000 Square Feet     |             |                |                                | \$1,009.33                    | \$0.50      |

Output prices are based on average Central Missouri Auction prices for 2020.

Adapted from Kansas high tunnel budgets developed by Tom Buller, Dr. Cary Rivard, and Kimberly Oxley.

One acre is equal to 43,560 square feet. A 2000 sq foot high tunnel is roughly 1/20th or 4.6% of an acre.

**Missouri High Tunnel Cucumbers Enterprise Budget, Fresh Market**

|                                                      |                |                   |  | Sales<br>Price<br>Dollars<br>Per<br>Unit*  | Gross<br>Returns<br>\$/2000 sq ft      | \$/sq. foot    |
|------------------------------------------------------|----------------|-------------------|--|--------------------------------------------|----------------------------------------|----------------|
| Revenue, \$/2000 Square Feet                         | /field Unit    | Yield             |  |                                            |                                        |                |
| Seedless Cucumbers                                   | lbs            | 2160              |  | \$1.94                                     | \$4,190.40                             | \$2.10         |
| <b>Total Revenue</b>                                 |                |                   |  |                                            | <b>\$4,190.40</b>                      | <b>\$2.10</b>  |
|                                                      |                |                   |  | Input<br>Price<br>(Dollars<br>Per<br>Unit) | Total<br>Material<br>and Labor<br>Cost | \$/sq.<br>foot |
| Costs, \$/2000 Square Feet                           | Input<br>Units | Input<br>Quantity |  |                                            |                                        |                |
| <b>Variable Costs</b>                                |                |                   |  |                                            |                                        |                |
| Soil Test                                            | each           | 1                 |  | \$12.50                                    | \$12.50                                | \$0.01         |
| Fertilizer (Compost)                                 | yards          | 6                 |  | \$5.00                                     | \$30.00                                | \$0.03         |
| Fertilizer (Compost)-Hired Labor                     | hours          | 3                 |  | \$12.50                                    | \$37.50                                |                |
| Tilling- Owner Labor                                 | hours          | 1                 |  | \$15.00                                    | \$15.00                                | \$0.01         |
| Lay Beds- Hired Labor                                | hours          | 3                 |  | \$12.50                                    | \$37.50                                | \$0.02         |
| Plastic Mulch                                        | feet           | 400               |  | \$0.03                                     | \$13.12                                | \$0.01         |
| Drip Tape                                            | feet           | 400               |  | \$0.03                                     | \$12.69                                | \$0.01         |
| Seeds                                                | each           | 1                 |  | \$30.00                                    | \$30.00                                | \$0.02         |
| Media                                                |                | 2                 |  | \$15.00                                    | \$30.00                                | \$0.02         |
| Equipment (pots)                                     | posts          | 1                 |  | \$20.00                                    | \$20.00                                | \$0.01         |
| Transplants- Hired Labor                             | hours          | 2                 |  | \$12.50                                    | \$25.00                                | \$0.01         |
| Planting-Hired Labor                                 | hours          | 3                 |  | \$12.50                                    | \$37.50                                | \$0.02         |
| Stringing                                            |                | 1                 |  | \$50.00                                    | \$50.00                                | \$0.10         |
| Stringing- Hired Labor                               | hours          | 12                |  | \$12.50                                    | \$150.00                               |                |
| Weeding- Hired Labor                                 | hours          | 4                 |  | \$12.50                                    | \$50.00                                | \$0.03         |
| Irrigation (setup and maint)- Hired Labor            | hours          | 4                 |  | \$12.50                                    | \$50.00                                | \$0.03         |
| Fertigation (fertilizer)                             |                | 1                 |  | \$37.00                                    | \$37.00                                | \$0.03         |
| Fertigation (setup and maint) - hired labor          | hours          | 2                 |  | \$12.50                                    | \$25.00                                |                |
| <b>Pest management</b>                               |                |                   |  |                                            |                                        |                |
| Insecticide                                          |                | 1                 |  | \$119.00                                   | \$119.00                               | \$0.12         |
| Scouting/application - hired labor                   | hours          | 10                |  | \$12.50                                    | \$125.00                               |                |
| Harvesting (6 weeks) - hired labor                   | hours          | 24                |  | \$12.50                                    | \$300.00                               | \$0.15         |
| Washing/grading/ packing (6 weeks) - hired labor     | hours          | 24                |  | \$12.50                                    | \$300.00                               | \$0.15         |
| Boxes and Other Supplies - hired labor               | hours          | 4                 |  | \$12.50                                    | \$50.00                                | \$0.03         |
| <b>Marketing</b>                                     |                |                   |  |                                            |                                        |                |
| Owner Labor - Farmers Markets (1/6 of stand)         | hours          | 10                |  | \$15.00                                    | \$150.00                               | \$0.08         |
| Farmers' market stand (1/6 of stand)                 | stand          | 0.167             |  | \$260.00                                   | \$43.33                                | \$0.02         |
| Marketing materials (1/6 of stand)                   | season         | 0.167             |  | \$500.00                                   | \$83.33                                | \$0.04         |
| <b>Fixed Costs</b>                                   |                |                   |  |                                            |                                        |                |
| High tunnel building use                             | months         | 2                 |  | \$110.22                                   | \$220.44                               | \$0.11         |
| <b>Total Cost</b>                                    |                |                   |  |                                            | <b>\$2,053.91</b>                      | <b>\$1.03</b>  |
| <b>Returns over Total Costs, \$/2000 Square Feet</b> |                |                   |  |                                            | <b>\$2,136.49</b>                      | <b>\$1.07</b>  |

Output prices are based on average Central Missouri Auction prices for 2020.

Adapted from Kansas high tunnel budgets developed by Tom Buller, Dr. Cary Rivard, and Kimberly Oxley.

One acre is equal to 43,560 square feet. A 2000 sq foot high tunnel is roughly 1/20th or 4.6% of an acre.

**Missouri High Tunnel Head Lettuce Enterprise Budget, Fresh Market**

| Revenue, \$/2000 Square Feet                         | Yield Units | Yield          | Sales Price | Gross             | \$/sq. foot   |
|------------------------------------------------------|-------------|----------------|-------------|-------------------|---------------|
|                                                      |             |                | Dollars     | Returns           |               |
|                                                      |             |                | Per Unit*   | \$/2000 sq ft     |               |
| Head Lettuce                                         | heads       | 1300           | \$1.62      | \$2,106.00        | \$1.05        |
| <b>Total Revenue</b>                                 |             |                |             | <b>\$2,106.00</b> | <b>\$1.05</b> |
| Costs, \$/2000 Square Feet                           | Input Units | Input Quantity | Input       | Total             | \$/sq. foot   |
|                                                      |             |                | Price       | Material          |               |
|                                                      |             |                | (Dollars    | and Labor         |               |
|                                                      |             |                | Per Unit)   | Cost              |               |
| <b>Variable Costs</b>                                |             |                |             |                   |               |
| Fertilizer (compost)                                 | yards       | 6              | \$5.00      | \$30.00           | \$0.02        |
| Fertilizer (compost spreading) - hired labor         | hours       | 3              | \$12.50     | \$37.50           | \$0.02        |
| Row cover                                            | sq feet     | 2000           | \$0.03      | \$60.00           | \$0.03        |
| Hoops                                                | each        | 75             | \$0.40      | \$30.00           | \$0.03        |
| Tilling - owner labor                                |             | 1              | \$15.00     | \$15.00           | \$0.02        |
| Lay beds - hired labor                               |             | 1              | \$12.50     | \$12.50           | \$0.01        |
| Seeds                                                | Thousand    | 3              | \$2.44      | \$7.32            | \$0.01        |
| Media                                                |             | 2              | \$15.00     | \$30.00           | \$0.03        |
| Equipment (pots)                                     |             | 1              | \$20.00     | \$20.00           | \$0.02        |
| Transplants - hired labor                            |             | 2              | \$12.50     | \$25.00           | \$0.03        |
| Planting - hired labor                               |             | 5              | \$12.50     | \$62.50           | \$0.06        |
| Weeding - hired labor                                |             | 3              | \$12.50     | \$37.50           | \$0.04        |
| Venting - owner labor                                |             | 2              | \$15.00     | \$30.00           | \$0.03        |
| <b>Pest management</b>                               |             |                |             |                   |               |
| Insecticide                                          | Insecticide | 1              | \$25.00     | \$25.00           | \$0.03        |
| Scouting/application - owner labor                   | hours       | 2              | \$15.00     | \$30.00           | \$0.03        |
| Harvesting and washing                               | hours       | 28             | \$12.50     | \$350.00          | \$0.35        |
| End of season cleanup - hired labor                  | hours       | 2              | \$12.50     | \$25.00           | \$0.03        |
| <b>Marketing</b>                                     |             |                |             |                   |               |
| Owner labor - Farmers' market (1/6 of stand)         | hours       | 10             | \$15.00     | \$150.00          | \$0.15        |
| Farmers' market stand (1/6 of stand)                 | stand       | 0.167          | \$260.00    | \$43.33           | \$0.04        |
| Marketing materials (1/6 of stand)                   | season      | 0.167          | \$500.00    | \$83.33           | \$0.08        |
| <b>Fixed Costs</b>                                   |             |                |             |                   |               |
| High tunnel building use                             | months      | 2              | \$110.22    | \$220.44          | \$0.22        |
| <b>Total Cost</b>                                    |             |                |             | <b>\$1,324.42</b> | <b>\$1.32</b> |
| <b>Returns over Total Costs, \$/2000 Square Feet</b> |             |                |             | <b>\$781.58</b>   | <b>\$0.78</b> |

Output prices are based on the 2020 average Chicago terminal price.

Adapted from Kansas high tunnel budgets developed by Tom Buller, Dr. Cary Rivard, and Kimberly Oxley.

One acre is equal to 43,560 square feet. A 2000 sq foot high tunnel is roughly 1/20th or 4.6% of an acre.

**Missouri High Tunnel Leafy Greens Enterprise Budget, Fresh Market**

|                                                      |             |                | Sales Price        | Gross                   |             |
|------------------------------------------------------|-------------|----------------|--------------------|-------------------------|-------------|
| Revenue, \$/2000 Square Feet                         | Yield Units | Yield          | Dollars Per Unit*  | Returns \$/2000 sq ft   | \$/sq. foot |
| Leafy Greens                                         | lbs         | 600            | \$4.00             | \$2,400.00              |             |
| <b>Total Revenue</b>                                 |             |                |                    | \$2,400.00              | \$1.20      |
|                                                      |             |                | Input Price        | Total                   |             |
| Costs, \$/2000 Square Feet                           | Input Units | Input Quantity | (Dollars Per Unit) | Material and Labor Cost | \$/sq. foot |
| <b>Variable Costs</b>                                |             |                |                    |                         |             |
| Fertilizer - materials                               | Yards       | 6              | \$5.00             | \$30.00                 | \$0.02      |
| Fertilizer - hired labor                             | Hours       | 3              | \$12.50            | \$37.50                 | \$0.02      |
| Row cover                                            | Sq Foot     | 2000           | \$0.03             | \$60.00                 | \$0.03      |
| Hoops                                                | each        | 75             | \$0.40             | \$30.00                 | \$0.02      |
| Tilling - owner labor                                | hours       | 1              | \$15.00            | \$15.00                 | \$0.01      |
| Lay beds - hired labor                               | hours       | 1              | \$12.50            | \$12.50                 | \$0.01      |
| Seeds                                                | pounds      | 1              | \$141.00           | \$141.00                | \$0.07      |
| Drip Irrigation                                      | feet        | 1300           | \$0.03             | \$34.97                 | \$0.02      |
| Drip Irrigation - hired labor                        | hours       | 2              | \$12.50            | \$25.00                 | \$0.01      |
| Planting - hired labor                               | hours       | 1              | \$12.50            | \$12.50                 | \$0.01      |
| Weeding - hired labor                                | hours       | 3              | \$12.50            | \$37.50                 | \$0.02      |
| IPM                                                  | Insecticide | 1              | \$25.00            | \$25.00                 | \$0.01      |
| IPM - hired labor                                    | Hours       | 4              | \$12.50            | \$50.00                 | \$0.03      |
| Venting - hired labor                                | Hours       | 5              | \$12.50            | \$62.50                 | \$0.03      |
| Other- lady bugs                                     |             | 1              | \$37.50            | \$37.50                 | \$0.02      |
| Harvesting and washing - hired labor                 | Hours       | 40             | \$12.50            | \$500.00                | \$0.25      |
| End of season clean up - hired labor                 | Hours       | 2              | \$12.50            | \$25.00                 | \$0.01      |
| <b>Marketing</b>                                     |             |                |                    |                         |             |
| Owner Labor - farmers' markets (1/6 of stand)        | hours       | 10             | \$15.00            | \$150.00                | \$0.08      |
| Farmers' market stand (1/6 of stand)                 | stand       | 0.167          | \$260.00           | \$43.33                 | \$0.02      |
| Marketing materials (1/6 of stand)                   | season      | 0.167          | \$500.00           | \$83.33                 | \$0.04      |
| <b>Fixed Costs</b>                                   |             |                |                    |                         |             |
| High tunnel building use                             | months      | 2              | \$110.22           | \$220.44                | \$0.11      |
| <b>Total Cost</b>                                    |             |                |                    | \$1,603.07              | \$0.82      |
| <b>Returns over Total Costs, \$/2000 Square Feet</b> |             |                |                    | \$796.93                | \$0.40      |

Output prices are based on Missouri grower interviews.

Adapted from Kansas high tunnel budgets developed by Tom Buller, Dr. Cary Rivard, and Kimberly Oxley.

One acre is equal to 43,560 square feet. A 2000 sq foot high tunnel is roughly 1/20th or 4.6% of an acre.

**Missouri High Tunnel Radishes/Beets/Carrots Enterprise Budget, Fresh Market**

|                                                      |             |                | Sales Price        | Gross                   |             |
|------------------------------------------------------|-------------|----------------|--------------------|-------------------------|-------------|
| Revenue, \$/2000 Square Feet                         | Yield Units | Yield          | Dollars Per Unit*  | Returns                 |             |
|                                                      |             |                |                    | \$/2000 sq ft           | \$/sq. foot |
| Beets                                                | lbs         | 1920           | \$2.00             | \$3,840.00              | \$1.92      |
| <i>Total Revenue</i>                                 |             |                |                    | \$3,840.00              | \$1.92      |
|                                                      |             |                |                    |                         |             |
|                                                      |             |                | Input Price        | Total                   |             |
| Costs, \$/2000 Square Feet                           | Input Units | Input Quantity | (Dollars Per Unit) | Material and Labor Cost | \$/sq. foot |
| <i>Variable Costs</i>                                |             |                |                    |                         |             |
| Fertilizer                                           | yards       | 6              | \$5.00             | \$30.00                 | \$0.03      |
| Fertilizer- hired labor                              | hours       | 3              | \$12.50            | \$30.00                 |             |
| Tilling - owner labor                                | hours       | 1              | \$15.00            | \$12.00                 | \$0.01      |
| Lay beds - hired labor                               | hours       | 1              | \$12.50            | \$12.00                 | \$0.01      |
| Seeds                                                | 20000       | 1              | \$61.00            | \$61.00                 | \$0.03      |
| Drip irrigation                                      | feet        | 400            | \$0.03             | \$10.76                 | \$0.02      |
| Drip irrigation - hired labor                        | hours       | 2              | \$12.50            | \$20.00                 |             |
| Planting - hired labor                               | hours       | 1              | \$12.50            | \$10.00                 | \$0.01      |
| Weeding - hired labor                                | hours       | 6              | \$12.50            | \$60.00                 | \$0.03      |
| <i>Pest management</i>                               |             |                |                    |                         |             |
| Insecticide- Brigade Applied 3x                      | Insecticide | 1              | \$25.00            | \$25.00                 |             |
| IPM - hired labor                                    | hours       | 4              | \$12.50            | \$40.00                 |             |
| Harvesting and washing - hired labor                 | hours       | 30             | \$12.50            | \$300.00                | \$0.15      |
| End of season clean up- hired labor                  | hours       | 2              | \$12.50            | \$20.00                 | \$0.01      |
| <i>Marketing</i>                                     |             |                |                    |                         |             |
| Owner Labor - farmers' markets (1/6 of stand)        | hours       | 10             | \$15.00            | \$120.00                | \$0.06      |
| Farmers' market stand (1/6 of stand)                 | stand       | 0.167          | \$260.00           | \$43.33                 | \$0.02      |
| Marketing materials (1/6 of stand)                   | season      | 0.167          | \$500.00           | \$83.33                 | \$0.04      |
| <i>Fixed Costs</i>                                   |             |                |                    |                         |             |
| High tunnel building use                             | months      | 2              | \$110.22           | \$220.44                | \$0.11      |
| <b>Total Cost</b>                                    |             |                |                    | \$1,097.86              | \$0.55      |
| <b>Returns over Total Costs, \$/2000 Square Feet</b> |             |                |                    | \$2,742.14              | \$1.37      |

Output prices are based on Kansas State budgets.

Adapted from Kansas high tunnel budgets developed by Tom Buller, Dr. Cary Rivard, and Kimberly Oxley.

One acre is equal to 43,560 square feet. A 2000 sq foot high tunnel is roughly 1/20th or 4.6% of an acre.

**Missouri High Tunnel Spinach Enterprise Budget, Fresh Market**

|                                                      |             |                | Sales Price        | Gross                   |               |
|------------------------------------------------------|-------------|----------------|--------------------|-------------------------|---------------|
| Revenue, \$/2000 Square Feet                         | /field Unit | Yield          | Dollars Per Unit*  | Returns                 |               |
|                                                      |             |                |                    | \$/2000 sq ft           | \$/sq. foot   |
| Spinach                                              | lbs         | 600            | \$3.21             | \$1,926.00              | \$0.96        |
| <b>Total Revenue</b>                                 |             |                |                    | \$1,926.00              | \$0.96        |
|                                                      |             |                |                    |                         |               |
|                                                      |             |                | Input Price        | Total                   |               |
| Costs, \$/2000 Square Feet                           | Input Units | Input Quantity | (Dollars Per Unit) | Material and Labor Cost | \$/sq. foot   |
| <b>Variable Costs</b>                                |             |                |                    |                         |               |
| Row cover                                            | sq foot     | 2000           | \$0.03             | \$60.00                 | \$0.03        |
| Hoops                                                | each        | 75             | \$0.40             | \$30.00                 | \$0.02        |
| Tilling - owner labor                                | hours       | 0.5            | \$15.00            | \$7.50                  | \$0.00        |
| Lay beds - hired labor                               | hours       | 1              | \$12.50            | \$12.50                 | \$0.01        |
| Seeds                                                | thousand    | 50             | \$1.12             | \$56.00                 | \$0.03        |
| Planting - hired labor                               | hours       | 0.5            | \$12.50            | \$6.25                  | \$0.00        |
| Hand irrigation- hired labor                         | hours       | 3              | \$12.50            | \$37.50                 | \$0.02        |
| Venting- owner labor                                 | hours       | 5              | \$15.00            | \$75.00                 | \$0.04        |
| Lady bugs                                            | lady bug    | 1              | \$37.67            | \$37.67                 | \$0.02        |
| Lady bug release - owner labor                       | hours       | 0.25           | \$15.00            | \$3.75                  |               |
| Harvesting and washing - hired labor                 | hours       | 40             | \$12.50            | \$500.00                | \$0.25        |
| End of season clean up - hired labor                 | hours       | 2              | \$12.50            | \$25.00                 | \$0.01        |
| <b>Marketing</b>                                     |             |                |                    |                         |               |
| Owner labor - farmers' markets (1/12 of stand)       | hours       | 5              | \$15.00            | \$75.00                 | \$0.04        |
| Farmers' market stand (1/12 of stand)                | stand       | 0.083          | \$260.00           | \$21.67                 | \$0.01        |
| Marketing materials (1/12 of stand)                  | season      | 0.083          | \$500.00           | \$41.67                 | \$0.02        |
| <b>Fixed Costs</b>                                   |             |                |                    |                         |               |
| High tunnel building use                             | months      | 6              | \$110.22           | \$661.31                | \$0.33        |
| <b>Total Cost</b>                                    |             |                |                    | \$1,650.81              | \$0.83        |
| <b>Returns over Total Costs, \$/2000 Square Feet</b> |             |                |                    | <b>\$275.19</b>         | <b>\$0.14</b> |

Output prices are based on the 2020 average Chicago terminal price.

Adapted from Kansas high tunnel budgets developed by Tom Buller, Dr. Cary Rivard, and Kimberly Oxley.

One acre is equal to 43,560 square feet. A 2000 sq foot high tunnel is roughly 1/20th or 4.6% of an acre.

**Missouri High Tunnel Strawberry Enterprise Budget, Fresh Market**

|                                                      | Yield<br>Units | Fall-Site Prep & Sep Planting |                     |                             | Spring - April to June Harvest |                              |                             |
|------------------------------------------------------|----------------|-------------------------------|---------------------|-----------------------------|--------------------------------|------------------------------|-----------------------------|
|                                                      |                | Yield                         | Gross               |                             | Yield                          | Sales                        |                             |
|                                                      |                |                               | Sales Price         | Returns                     |                                | Price                        | Returns                     |
|                                                      |                |                               | Dollars Per<br>Unit | Dollars Per<br>Acre         |                                | Dollars<br>Per Unit          | Dollars Per<br>Acre         |
| <b>Revenues, \$/1000 Square Feet</b>                 |                |                               |                     |                             |                                |                              |                             |
| Fresh Berry Sales*                                   | pounds         | 0                             | 5.50                | \$0.00                      | 650.52                         | 5.50                         | \$3,577.86                  |
| <b>Total Revenue</b>                                 |                |                               |                     | \$0.00                      |                                |                              | \$3,577.86                  |
| *Adjusted for 16.6% yield loss                       |                |                               |                     |                             |                                |                              |                             |
|                                                      | Input<br>Units | Fall-Site Prep & Sep Planting |                     |                             | Spring - April to June Harvest |                              |                             |
|                                                      |                | Input<br>Quantity             | Input Price         |                             | Input<br>Quantity              | Input                        |                             |
|                                                      |                |                               | Dollars Per<br>Unit | Cost<br>Dollars Per<br>Acre |                                | Price<br>Dollars<br>Per Unit | Cost<br>Dollars Per<br>Acre |
|                                                      |                |                               |                     |                             |                                |                              |                             |
| <b>Variable Costs, \$/1000 Square Feet</b>           |                |                               |                     |                             |                                |                              |                             |
| Plants                                               | plants         | 650                           | 0.15                | \$97.50                     | 0                              | 0.15                         | \$0.00                      |
| Soil test                                            | soil test      | 1                             | 12.5                | \$12.50                     | 0                              | 12.5                         | \$0.00                      |
| Plastic mulch                                        | feet           | 158                           | 0.06                | \$10.11                     | 0                              | 0.064                        | \$0.00                      |
| <i>Fertilizer</i>                                    |                |                               |                     |                             |                                |                              |                             |
| Starter Fertilizer 9-45-15 (water soluble)           | pounds         | 1                             | 2.75                | \$2.75                      | 0                              | 2.75                         | \$0.00                      |
| Nitrogen                                             | pounds         | 1.1                           | 16.03636364         | \$17.64                     | 0                              | 16.03636                     | \$0.00                      |
| Phosphate                                            | pounds         | 0                             | 0.315               | \$0.00                      | 0                              | 0.315                        | \$0.00                      |
| Potash                                               | pounds         | 0                             | 0.3                 | \$0.00                      | 0                              | 0.3                          | \$0.00                      |
| Lime                                                 | tons           | 0                             | 23                  | \$0.00                      | 0                              | 23                           | \$0.00                      |
| <i>Insecticides</i>                                  |                |                               |                     |                             |                                |                              |                             |
| Assail 30SG                                          | ounces         | 0                             | 4.06171875          | \$0.00                      | 1                              | 4.061719                     | \$4.06                      |
| Provado 1.6F                                         | ounces         | 0                             | 0.93                | \$0.00                      | 0                              | 0.93                         | \$0.00                      |
| <i>Fungicides</i>                                    |                |                               |                     |                             |                                |                              |                             |
| Captan 80W                                           | pounds         | 0                             | 4.831666667         | \$0.00                      | 1                              | 4.831667                     | \$4.83                      |
| Pristine 38WDG                                       | ounces         | 0                             | 3.29125             | \$0.00                      | 0                              | 3.29125                      | \$0.00                      |
| Drip tape                                            | feet           | 411                           | 0.032               | \$13.15                     | 0                              | 0.032                        | \$0.00                      |
| Irrigation/Fertigation                               | months         | 0                             | 6.35                | \$0.00                      | 1                              | 6.35                         | \$6.35                      |
| Plant analysis kit                                   | 1 kit          | 0                             | 30                  | \$0.00                      | 1                              | 30                           | \$30.00                     |
| Row Covers                                           |                | 661.2                         | 0.06                | \$39.67                     |                                |                              |                             |
| Anchor pins                                          |                |                               |                     | \$9.98                      |                                |                              |                             |
| Fuel & Oil                                           |                |                               |                     | \$2.50                      |                                |                              |                             |
| Pollination                                          |                |                               |                     |                             | 1                              | 0                            | \$21.67                     |
| <i>Packaging</i>                                     |                |                               |                     |                             |                                |                              |                             |
| Plastic clamshells                                   | Quart          | 0                             | 0.111               | \$0.00                      | 542                            | 0.111                        | \$60.16                     |
| Carriers                                             | Box/tray       | 0                             | 1.26                | \$0.00                      | 68                             | 1.26                         | \$85.68                     |
| Refrigeration                                        | months         | 0                             | 375                 | \$0.00                      | 0                              | 375                          | \$0.00                      |
| <i>Labor</i>                                         |                |                               |                     |                             |                                |                              |                             |
| General labor                                        | hours          | 10.5                          | 12.5                | \$131.25                    | 13                             | 12.5                         | \$162.50                    |
| Harvest labor                                        | hours          | 0.0                           | 12.5                | \$0.00                      | 12.0                           | 12.5                         | \$150.00                    |
| Other labor                                          | hours          | 0                             | 12.5                | \$0.00                      | 6                              | 12.5                         | \$75.00                     |
| Transportation                                       |                |                               |                     | \$0.00                      |                                |                              | \$0.00                      |
| Tillage                                              | trips          | 1                             | 5                   | \$5.00                      | 0                              | 17.06                        | \$0.00                      |
| Interest on operating capital                        | months         | 6                             | 0.06                | \$10.26                     | 6                              | 0.06                         | \$18.01                     |
| High Tunnel Fixed Costs                              | months         | 1                             | 616.09              | \$616.09                    | 1                              | 616.09                       | \$616.09                    |
| Land Fixed Costs                                     | months         | 4                             | 0.58                | \$2.31                      | 8                              | 0.58                         | \$4.62                      |
| Total Costs                                          |                |                               |                     | \$970.71                    |                                |                              | \$1,234.35                  |
| <b>Returns over Total Costs, \$/1000 Square Feet</b> |                |                               |                     | -\$970.71                   |                                |                              | \$2,343.51                  |

**Missouri High Tunnel Tomato Enterprise Budget, Fresh Market**

|                                                   |             |          | Sales Price  |                |             |
|---------------------------------------------------|-------------|----------|--------------|----------------|-------------|
|                                                   |             |          | Dollars Per  | Gross Returns  |             |
| Revenue, \$/2000 Square Feet                      | Yield Units | Yield    | Unit**       | \$/2000 sq ft  | \$/sq. foot |
| Tomatoes*                                         | lbs         | 2926     | \$2.43       | \$7,110.18     | \$3.56      |
| Total Revenue                                     |             |          |              | \$7,110.18     | \$3.56      |
| * 266 plants @ 11 lbs/plant                       |             |          |              |                |             |
|                                                   |             |          | Input Price  | Total Material |             |
|                                                   |             | Input    | (Dollars Per | and Labor      |             |
| Costs, \$/2000 Square Feet                        | Input Units | Quantity | Unit)        | Cost           | \$/sq. foot |
| Variable Costs                                    |             |          |              |                |             |
| Soil test                                         | each        | 1        | \$12.50      | \$12.50        | \$0.01      |
| Tilling - owner labor                             | hours       | 1        | \$15.00      | \$15.00        | \$0.01      |
| Lay beds - hired labor                            | hours       | 3        | \$12.50      | \$37.50        | \$0.02      |
| Plastic mulch                                     | feet        | 400      | \$0.03       | \$13.12        | \$0.01      |
| Drip tape                                         | feet        | 400      | \$0.03       | \$12.69        | \$0.01      |
| Install mulch & drip tape - hired labor           | hours       | 1        | \$12.50      | \$12.50        | \$0.01      |
| Transplants                                       | each        | 266      | \$0.27       | \$71.82        | \$0.04      |
| Planting transplants - hired labor                | hours       | 2        | \$12.50      | \$25.00        | \$0.01      |
| Planting transplants - owner labor                | hours       | 1        | \$15.00      | \$15.00        | \$0.01      |
| Stakes (72")                                      | posts       | 83       | \$1.40       | \$116.20       | \$0.06      |
| Staking - hired labor                             | hours       | 10       | \$12.50      | \$125.00       | \$0.06      |
| Pruning and clipping - hired labor                | hours       | 23       | \$12.50      | \$287.50       | \$0.14      |
| Weeding - hired labor                             | hours       | 2        | \$12.50      | \$25.00        | \$0.01      |
| Irrigation (setup and maint) - owner labor        | hours       | 3        | \$15.00      | \$45.00        | \$0.02      |
| Fertigation (soluble 20-20-20)                    | ounces      | 360      | \$0.15       | \$54.77        | \$0.03      |
| Fertigation (setup and maint) - hired labor       | hours       | 2        | \$12.50      | \$25.00        | \$0.01      |
| Pest management                                   |             |          |              |                |             |
| Insecticide- Brigade applied 3x                   | ounces/app  | 10       | \$0.17       | \$5.10         | \$0.00      |
| Scouting/application - hired labor                | hours       | 1        | \$12.50      | \$12.50        | \$0.01      |
| Scouting/application - owner labor                | hours       | 10       | \$15.00      | \$150.00       | \$0.08      |
| Harvesting (12 weeks) - hired labor               | hours       | 42       | \$12.50      | \$525.00       | \$0.26      |
| Washing/grading/ packing (12 weeks) - hired labor | hours       | 10       | \$12.50      | \$125.00       | \$0.06      |
| Boxes and other supplies - hired labor            | hours       | 4        | \$12.50      | \$50.00        | \$0.03      |
| Marketing                                         |             |          |              |                |             |
| Owner labor - farmers' markets (1/3 of stand)     | hours       | 20       | \$15.00      | \$300.00       | \$0.15      |
| Farmers' market stand (1/3 of stand)              | stand       | 0.333    | \$260.00     | \$86.67        | \$0.04      |
| Marketing materials (1/3 of stand)                | season      | 0.333    | \$500.00     | \$166.67       | \$0.08      |
| Fixed Costs                                       |             |          |              |                |             |
| High tunnel building use                          | months      | 6        | \$110.22     | \$661.31       | \$0.33      |
| Total Cost                                        |             |          |              | \$2,975.83     | \$1.49      |
| Returns over Total Costs, \$/2000 Square Feet     |             |          |              | \$4,134.35     | \$2.07      |

Output prices are based on average Central Missouri Auction prices for 2020.

Farmers' market price could be 80 to 100% higher, closer to retail prices, but you will likely not sell out.

Adapted from Kansas high tunnel budgets developed by Tom Buller, Dr. Cary Rivard, and Kimberly Oxley.

One acre is equal to 43,560 square feet. A 2000 sq foot high tunnel is roughly 1/20th or 4.6% of an acre.

**Missouri Perennial Crop Returns, Years to Breakeven & Returns Over Life of Stand****Apple Returns**

|                                        |    |          |
|----------------------------------------|----|----------|
| Net Present Value of Net Returns       |    |          |
| 8 years to breakeven (3 years bearing) |    | \$3,502  |
| 10 Year Orchard (6 years bearing)      |    | \$9,748  |
| 15 Year Orchard (11 years bearing)     |    | \$22,521 |
| 20 Year Orchard (16 years bearing)     |    | \$32,066 |
| 30 Year Patch (26 years bearing)       |    | \$44,528 |
| Discount Rate                          | 6% |          |

## Average Return Per Year (net present value), \$/Acre

|                                        |         |
|----------------------------------------|---------|
| 8 years to breakeven (3 years bearing) | \$438   |
| 10 Year Orchard (6 years bearing)      | \$975   |
| 15 Year Orchard (11 years bearing)     | \$1,501 |
| 20 Year Orchard (16 years bearing)     | \$1,603 |
| 30 Year Patch (26 years bearing)       | \$1,484 |

**Asparagus Returns**

|                                            |    |          |
|--------------------------------------------|----|----------|
| Net Present Value of Net Returns           |    |          |
| Breakeven 8 Year Stand (7 years producing) |    | \$1,535  |
| 10 Year Stand (9 years producing)          |    | \$5,045  |
| 15 Year Stand (13 years producing)         |    | \$12,224 |
| Discount Rate                              | 6% |          |

## Average Return Per Year, \$/Acre

|                                            |       |
|--------------------------------------------|-------|
| Breakeven 8 Year Stand (7 years producing) | \$192 |
| 10 Year Stand (9 years producing)          | \$505 |
| 15 Year Stand (14 years producing)         | \$815 |

**Blackberry Returns**

|                                          |    |          |
|------------------------------------------|----|----------|
| Net Present Value of Net Returns         |    |          |
| Breakeven 5 Year Patch (3 years bearing) |    | \$1,984  |
| 10 Year Patch (8 years bearing)          |    | \$20,539 |
| 15 Year Patch (13 years bearing)         |    | \$34,404 |
| Discount Rate                            | 6% |          |

## Average Return Per Year, \$/Acre

|                                          |         |
|------------------------------------------|---------|
| Breakeven 5 Year Patch (3 years bearing) | \$397   |
| 10 Year Patch (8 years bearing)          | \$2,054 |
| 15 Year Patch (13 years bearing)         | \$2,294 |

**Blueberry Returns**

|                                          |    |          |
|------------------------------------------|----|----------|
| Net Present Value of Net Returns         |    |          |
| Breakeven 5 Year Patch (2 years bearing) |    | \$5,438  |
| 15 Year Patch (12 years bearing)         |    | \$76,280 |
| 20 Year Patch (17 years bearing)         |    | \$98,920 |
| Discount Rate                            | 6% |          |

## Average Return Per Year, \$/Acre

|                                          |         |
|------------------------------------------|---------|
| Breakeven 5 Year Patch (2 years bearing) | \$1,088 |
| 15 Year Patch (12 years bearing)         | \$5,085 |
| 20 Year Patch (17 years bearing)         | \$4,946 |

### Missouri Perennial Crop Returns, Years to Breakeven & Returns Over Life of Stand ( Elderberry Returns

#### Net Present Value of Net Returns

|                                            |          |
|--------------------------------------------|----------|
| Breakeven 4 Year Stand (3 years producing) | \$1,354  |
| 10 Year Stand (9 years producing)          | \$30,701 |
| 15 Year Stand (13 years producing)         | \$48,424 |

Discount Rate 6%

#### Average Return Per Year, \$/Acre

|                                            |         |
|--------------------------------------------|---------|
| Breakeven 4 Year Stand (3 years producing) | \$169   |
| 10 Year Stand (9 years producing)          | \$3,070 |
| 15 Year Stand (14 years producing)         | \$3,228 |

### Peach Returns

#### Net Present Value of Net Returns

|                                        |          |
|----------------------------------------|----------|
| 8 years to breakeven (4 years bearing) | \$654    |
| 10 Year Orchard (6 years bearing)      | \$5,149  |
| 15 Year Orchard (11 years bearing)     | \$14,341 |
| 20 Year Orchard (16 years bearing)     | \$21,210 |
| 30 Year Patch (26 years bearing)       | \$30,178 |

Discount Rate 6%

#### Average Return Per Year (net present value), \$/Acre

|                                        |         |
|----------------------------------------|---------|
| 8 years to breakeven (4 years bearing) | \$82    |
| 10 Year Orchard (6 years bearing)      | \$515   |
| 15 Year Orchard (11 years bearing)     | \$956   |
| 20 Year Orchard (16 years bearing)     | \$1,060 |
| 30 Year Patch (26 years bearing)       | \$1,006 |

### Strawberry Returns

#### Net Present Value of Net Returns

|                                |          |
|--------------------------------|----------|
| 4 Year Patch (3 years bearing) | \$20,146 |
|--------------------------------|----------|

Discount Rate 6%

#### Average Return Per Year, \$/Acre

|                                |         |
|--------------------------------|---------|
| 4 Year Patch (3 years bearing) | \$5,036 |
|--------------------------------|---------|

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