

Sample Budget for Blueberry Production Under Various Integrated Pest Management and Marketing Strategies, 2020

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Introduction

The objective of this document is to help users understand and navigate the [sample blueberry budget](#) created by the University of Tennessee. This sample budget was created to guide blueberry producers and those interested in producing blueberries on the factors to consider when estimating their production and marketing costs. Additionally, this sample budget helps users evaluate changes in costs associated with two integrated pest management (IPM) strategies (i.e., low and moderate) and three marketing strategies (i.e., 100 percent ready-picked retail; 50 percent U-Pick, 50 percent ready-picked retail; and 75 percent U-Pick, 25 percent ready-picked retail).

The sample budget shows examples of blueberry production costs given specific assumptions. Therefore, users should modify numbers to estimate their farm costs. Every farm is unique; hence, estimated costs will vary depending on soil conditions, blueberry species, production practices used and pest, weed and disease pressure, among other factors.

Sample Budget Details

Pre-planting

The examples presented in this sample budget are based on 1 acre of blueberries. We assumed the blueberry species grown on this acre are Rabbiteye. Although in this sample budget we are assuming only Rabbiteye species are grown, it is important to notice that the combination of two species, such as Highbush and Rabbiteye, would expand the blueberry marketing window. The harvesting period for Highbush species is mid-June to mid-July, and the harvesting period for Rabbiteye is mid-July to September. The exact time will vary some from year to year and with location. We assumed all preparation activities would happen in Year 0 to allow at least six months to a year for the soil to reach ideal conditions for blueberry production.

Soil tests are necessary for Year 0, as the results from these tests will guide producers on the requirements to lower pH and adjust soil fertility conditions. Soil tests are budgeted at \$15 per soil test. In Year 0, we assumed a soil probe is purchased at \$95.91.

We assumed raised beds on which to plant blueberries are built in Year 0. By doing this, we can amend the soils to correct issues with pH, organic matter content and internal drainage characteristics. We assumed an initial application of mulch of 269 cubic yards per acre. We also assumed that mulch would need to be reapplied every two years (Years 2, 4 and 6) at 68 cubic yards per acre, assuming a loss of 1.5 inches per year.¹ We assumed either pine bark or sawdust is used as mulch and as a source of organic matter that would help adjust soil pH, keep soil temperature cooler during the summer, control for weeds and maintain soil moisture. Ideal organic matter content should be at 3 percent or higher.

The ideal soil pH for blueberry production is between 4.5 and 5.5.² In Year 0, mulch application is one of the strategies to lower soil pH, but we assumed the application of elemental sulfur is needed to rapidly acidify the soil. We assumed 650 lbs at \$0.36 per lb of elemental sulfur per acre are applied in Year 0.

We assumed 800 lbs per acre of 10-10-10 at \$0.22 per lb are applied. We added this fertilizer cost just as a reference as P and K needs will be determined by soil test and vary greatly from farm to farm.

We assumed grass would be planted between rows to support equipment used between rows and avoid soil erosion. We also assumed 10 lbs per acre of grass seed at \$2.59 per lb is planted in between rows in Year 0.

Planting

We assumed a 10- or 12-foot space between bed centers and 6-foot space between blueberry plants. This assumption determines the number of plants per acre. If you are growing more than one species, it is probably better to use the same space between rows and plants, regardless of the species, for management purposes. For example, if you have variation in space between rows and plants, that would complicate mowing and other activities that require specific equipment sizes.

When assuming a 6 feet by 12 feet space, 605 two-year-old plants at \$4.50 each are transplanted. When assuming a 6 feet by 10 feet space, 726 2-year-old plants are transplanted. We assumed transplanting happens in early spring (March). The 605-plant density is appropriate for U-Pick operations. Farmers planning to sell wholesale should consider a higher plant density per acre.³ We assumed 15 plants need to be replanted in Year 2. We assumed six hours per acre are designated to remove fruit buds and prune blueberry bushes in Years 1 and 2. It is recommended to not let bushes produce fruit in Years 1 and 2 to allow for better plant establishment, growth and long-term health. Ideally, fruit buds should be removed when plants are dormant, and this is also the best time to prune.

Annual pruning of blueberry bushes is required to help with establishing and developing plants that consistently produce large, early maturing berries. After plants are established, pruning is necessary for increased productivity.⁴ We assumed a pruner would be purchased in Year 1 at \$45. In Years 3 and 4, 20 and 30 hours per year, respectively, are designated for pruning activities (24

1 Dellachiesa, A. 2005. "Feasibility of Production and Marketing Blueberries in Tennessee." M.S. Agricultural Economics, University of Tennessee, Knoxville.

2 University of Kentucky. 2013. "Midwest Blueberry Production Guide." Available online at <https://bit.ly/2SaaTks>

3 Dellachiesa, A. 2005. "Feasibility of Production and Marketing Blueberries in Tennessee." M.S. Agricultural Economics, University of Tennessee, Knoxville.

4 University of Kentucky. 2013. "Midwest Blueberry Production Guide". Available online at <https://bit.ly/2SaaTks>

and 36 hours when assuming a plant density of 726 plants/acre). In Years 5 to 7, 50 hours per year are designated for pruning activities (60 hours when assuming a plant density of 726 plants/acre).

Fertilizer, Herbicides, Fungicides and Insecticides

As stated above, fertilizer requirements would vary considerably from farm to farm. We assumed soil tests would be performed annually. Although not listed here, tissue tests are recommended to assess plant's additional nutrient needs. Following the University of Tennessee recommendations, we assumed in Year 1 fertilizer would be applied three times starting about a month after planting the blueberry plants (April) and again in May and June. We assumed only ammonium sulfate would be applied in Years 1 to 7. In Year 1, we assumed 120 lbs of ammonium sulfate are applied at \$0.37 per lb (40 lbs in April, 40 lbs in May and 40 lbs in June). In Years 2 to 7, we assumed 60 lbs of ammonium sulfate are applied at similar times as the fertilizer applications in Year 1.

Persistent weed pests should be eliminated before planting blueberry plants. In the example presented in this sample budget, we did not add costs associated with weed control, as this would vary greatly from farm to farm, depending on specific weed pests. Nonetheless, it is important to acknowledge that effective weed control management strategies are critical when growing blueberries, especially before planting.⁵

In the sample budget, two potential IPM scenarios could be selected: low-input and moderate-input. For the low-input program, we assumed Serenade ASO and Entrust SC are applied at pre-bloom or 10-14 days after petal fall and preharvest. Serenade ASO is a fungicide aimed at controlling a variety of blueberry diseases, including mummy berry, Phomopsis, Botrytis, Alternaria and Exobasidium. Entrust SC is an insecticide, and we assumed it is applied to target insect pests, including thrips, spotted wing drosophila (SWD) and blueberry maggot. The moderate-input treatment included a pre-bloom treatment and a preharvest treatment and included two additional treatments at 10-14 days after petal fall and postharvest. The fungicides listed may be applied during bloom for disease management, but insecticides should not be applied during bloom. Moderate-input products included Pristine and Switch 62.5WG, both of which are fungicides aimed at controlling the previously mentioned diseases, and Entrust SC and Assail 30SG, which are insecticides that control the previously mentioned insect pests. The moderate-input strategy reflects a higher pest and disease pressure scenario, where additional IPM treatments are required to achieve satisfactory control. It also includes more products, which reflects the need to alternate chemical modes of action, especially when using a more pesticide-intensive IPM program. In Table 1, we show spray schedule assumptions for the two IPM scenarios, and Table 2 shows application rates and price assumptions associated with these two scenarios.

It is important to acknowledge that the scenarios presented in Table 2 are just examples of IPM strategies. These strategies would vary depending on the specific pest and disease pressure situations faced by each farm. In either scenario, plantings need to be monitored for SWD. If SWD is not found, then no sprays need to be applied for it. If, however, SWD is present, the recommended control program will be the same for the low-input and moderate-input IPM scenarios. This will involve starting with the first spray at two weeks prior to the first anticipated harvest and conducted at weekly intervals throughout the duration of harvest. For Highbush blueberries, where the anticipated duration of the harvest will be about four weeks, this means six sprays for SWD. For Rabbiteye blueberries, where the projected harvest period will stretch to about six weeks or longer, a minimum of eight sprays will be needed. Also, from an insecticide resistance management standpoint, a given insecticide should not be used more than two times before rotating to a second insecticide that has different chemistry. Table 3 lists some alternative insecticides, along with their preharvest interval and notes on their use. According to the University of Tennessee recommendations, a field should be harvested every second to third day to prevent berries from getting overripe, which is critical for SWD control. The University of Tennessee recommendations also suggest the use of insecticides that have a short preharvest interval. The insecticides presented in Table 3 are labeled for blueberry maggot control as well as

⁵ Ibid.

SWD control. For additional blueberry IPM recommendations, go to the [Southern Region Small Fruit Consortium website](#).

Table 1. Low and Moderate IPM Spray Schedules

| Spray # | Target Month Application | Low-input Products Applied | Moderate-input Products Applied |
|---------|--------------------------|--------------------------------------|--|
| 1 | April | Serenade ASO + Entrust SC | Entrust SC then Pristine, applied separately |
| 2 | May | None | Switch 62.5 WG + Assail 30 S.G. |
| 3 | June | Serenade ASO + Entrust SC (tank mix) | Entrust SC then Pristine, applied separately |
| 4 | July | None | Switch 62.5 WG + Assail 30 S.G. |

*Pristine **cannot** be tank-mixed with any other products. All other products may be tank-mixed.

Table 2. Low and Moderate IPM Application Rates Per Acre and Chemicals' Prices

| | Label Rate Range | Application Rate | Price Per Application Unit |
|----------------|------------------|------------------|----------------------------|
| Serenade ASO | 2-4 qt | 3 qt | \$9.95/qt |
| Entrust SC | 4-6 fl oz | 5 oz | \$14.14/oz |
| Pristine | 18.5-23 oz | 20.75 oz | \$3.18/oz |
| Switch 62.5 WG | 11-14 oz | 12.5 oz | \$5.54/oz |
| Assail 30 SG | 4.5-5.3 oz | 4.9 oz | \$4.47/oz |

Table 3. Alternative Insecticides

| Insecticide | Preharvest interval (days) | Use |
|------------------------------------|----------------------------|--|
| Imidan | 3 | Maximum of 2 applications per season |
| Malathion | 1 | Maximum of 3 applications per season for the ULV and 57EC formulations and 2 per season for the 8F formulation |
| Entrust 2SC or 80W | 3 | For use information, go to https://smallfruits.org/ipm-production-guides |
| Danitol 2.4EC | 3 | Maximum of 2 applications per season |
| Mustang 1.5 EC, Mustang Maxx 0.8EC | 1 | Maximum of 6 applications per season |

Machinery and Equipment

We assumed a trickle irrigation system is set up in Year 0. The annual fixed costs associated with this irrigation system is assumed to be \$258 per acre. This cost would vary depending on the irrigation system used (e.g., trickle, overhead). Trickle irrigation systems are preferred over overhead systems because the water is applied to the soil or mulch cover and does not contact leaves or fruit, which could aggravate disease issues. In general, trickle irrigation systems use less water and require a lower pump capacity than overhead systems.

We assumed one tractor (i.e., a 50 horsepower four-wheel-drive tractor) and a 4x4 utility vehicle are used to perform all activities associated with blueberry production. In Table 4, we show estimated direct (e.g., repair and maintenance, fuel, and labor costs) and fixed costs associated with all implements used for blueberry production in this sample budget. Fixed machinery costs associated with tractors, utility vehicles and implements were calculated using the Mississippi State Budget Generator (version 6.0). Blueberry production costs include an annual fixed cost of \$440 per acre associated with a cooler used to maintain berry quality and enhance shelf life.

Table 4. Machinery and Equipment Costs Per Acre Used for Blueberry Production

| | Direct Costs | Fixed Costs |
|---------------------------------|--------------|-------------|
| Bed Shaper | \$21.08 | \$26.47 |
| Disk Harrow | \$8.13 | \$10.45 |
| Fertilizer Spreader (Pull Type) | \$5.65 | \$17.46 |
| Front-End Loader | \$15.46 | \$23.43 |
| Grain Drill | \$11.39 | \$17.07 |
| Rotary Cutter | \$4.14 | \$6.04 |
| Rotary Tiller | \$25.19 | \$33.50 |
| Side Dresser | \$23.04 | \$39.44 |
| Sprayer — Utility | \$4.89 | \$6.68 |
| Sub-soiler | \$10.84 | \$15.78 |
| Trailer BB Plants | \$48.37 | \$60.79 |
| Trailer Utility | \$14.51 | \$18.19 |

Source: Mississippi State University Budget Generator

Labor and Fuel

Hand labor was estimated at the 2020 U.S. Department of Labor Tennessee Adverse Effect Wage Rate of \$12.40.⁶ Operator labor was estimated at \$17.27/hour based on the 2019 U.S. Department of Labor estimates for Tennessee. Gasoline and diesel prices were estimated at \$2.20 and \$2.30 per gallon, respectively. Hand labor is associated with irrigation check activities, pruning and harvesting. We assigned values to the operator and unpaid family labor at a rate of \$17.27/hour.

Capital

The interest on operating capital was calculated annually at a rate of 6 percent. Operating interest is assumed to be charged on half of all variable expenses.

Harvest and Postharvest

We assumed that no crops would be harvested in Years 1 and 2. We assumed plantings would initiate producing yield in Year 3. We also assumed the maximum anticipated yield at crop maturity would happen in Year 6 and would be 12,000 pints per acre or about 20 pints per plant (Table 5).

⁶ <https://www.dol.gov/agencies/eta/foreign-labor/wages/adverse-effect-wage-rates>

⁵ Sample Budget for Blueberry Production, 2020

Table 5. Estimated Yields by Year of Blueberry Production

| Production Year | Pints/Acre | % of Full Production |
|-----------------|------------|----------------------|
| 0 | 0.00 | 0% |
| 1 | 0.00 | 0% |
| 2 | 0.00 | 0% |
| 3 | 2000.00 | 17% |
| 4 | 6000.00 | 50% |
| 5 | 9960.00 | 83% |
| 6 | 12000.00 | 100% |
| 7 | 12000.00 | 100% |

We assumed that harvested berries are sorted into 1-pint plastic clamshells. We assumed a cost of \$0.16 per plastic container. We assumed the estimated harvest rate for picking blueberries is 25 pints per hour. Therefore, we assumed 80, 240 and 398 hours are designated for harvesting activities in Years 3, 4 and 5, respectively. After Year 5, 480 hours are designated for harvesting activities. It is assumed that 10 to 15 pickers are needed to harvest 1 acre of blueberries.⁷

Operating costs associated with the refrigeration of blueberries to maintain berry quality and enhance shelf life is estimated at \$36.60 per acre per year.

Marketing

In this sample budget, we assumed blueberries would be marketed through farmers markets, on-farm, roadside stands and/or Pick-Your-Own (PYO). The choice of marketing strategies would depend on various factors, including farm location that would determine the distance to customers and markets, and labor and time availability for marketing activities. The advantage of marketing blueberries using a PYO strategy is the labor savings associated with reducing harvesting activities. When blueberries are marketed through PYO, it is important to still have some labor available to harvest blueberries in the parts of the field that are not harvested by the customers. It is important for SWD control not to have overripe berries in the field. It is estimated that 450 customers could harvest about 6,000 lbs of blueberries.⁸

There are other considerations and costs associated with using a PYO marketing strategy, including adequate parking area, restroom facilities, convenient and safe access and adequate liability insurance. In the midst of the COVID-19 pandemic, there are additional elements a farm business should consider when running a PYO operation, including logistics to guarantee social distancing between customers, employee training, purchase of Personal Protecting Equipment (PPE) and portable hand-washing stations.⁹

Marketing costs were estimated at 10 percent of gross revenue. Gross revenue would depend on marketing strategies. We assumed blueberries would be sold at \$2.39 per pint for PYO blueberries and \$3.62 per pint for already-picked blueberries sold on-farm, roadside stands or farmers markets.

7 Kaiser, C., and M. Ernst. 2018. "Highbush Blueberries." Center for Crop Diversification, University of Kentucky. Available online at <https://bit.ly/3n0sut9>.

8 Dellachiesa, A. 2005. "Feasibility of Production and Marketing Blueberries in Tennessee." M.S. Agricultural Economics, University of Tennessee, Knoxville.

9 Center for Crop Diversification. 2020. "Considerations for Operating a Pick-Your-Own Operation During the COVID-19 Pandemic." Available online at <https://bit.ly/346FQvj>.

Excel Sample Budget

The blueberry sample budget Excel tool is available on the [Department of Agricultural and Resource Economics website](#). In this Excel tool, users can select different scenarios associated with plant density, IPM and marketing strategies in the “General Assumptions” spreadsheet:

1. You can select the space between rows and bed centers you want to use. This selection will determine the number of plants per acre. You have two options: 6 ft x12 ft and 6 ft x 10 ft.
2. You can select one of two IPM strategies: low and moderate. Each scenario will have different implications for the chemicals you would apply and the frequency of application (see Tables 1 and 2, above).
3. You can select three strategies to market your blueberries: 1) 100 percent retail (e.g., on-farm or at farmers markets); 2) 50 percent PYO and 50 percent ready-picked to be marketed on-farm, at roadside stands or at farmers markets; or 3) 75 percent PYO and 25 percent ready-picked to be marketed on-farm, at roadside stands or at farmers markets.

After making your plant density, IPM and marketing strategy selections, you can evaluate the overall changes in costs and changes in costs per year in the “Summary Budget” spreadsheet. The “Print” button on this spreadsheet allows the user to print this one-page summary. The “Intro” button allows you to return to the introductory page. On the “Summary Budget” spreadsheet, you can click on the first row of the table “Year X” to see the budget for each year.

Growers can modify some values of the individual year’s budget spreadsheets (“Blueberry Budget Year X”) highlighted in grey and use the individual year budgets function to evaluate their own production costs per year. If quantities and details of the sample budget are modified, original values can be restored when clicking on the “Default” button on the bottom right of the “Blueberry Budget Year X” spreadsheets. The “Print” button on these spreadsheets allows the user to print each year’s budget. **The “Summary Budget” spreadsheet will not reflect user changes because the summary budget cost categories do not match each year’s budget cost categories.**

Users should note that input prices used in this sample budget were current as of October of 2020 and are subject to change. Input prices were collected from a handful of randomly selected businesses; therefore, users are encouraged to conduct a thorough search when sourcing input suppliers.

Examples of Costs Associated With Various Marketing and IPM Strategies

Using the Excel sample blueberry budget, we estimated costs associated with two IPM strategy scenarios (i.e., low and moderate) and one marketing strategy (i.e., 100 percent ready-picked blueberries to be marketed through farmers markets, roadside stands or on-farm). As you can see in Tables 6 and 7, in Years 1 to 3, the largest expenses are those associated with incorporating mulch and plants. In Years 3 to 7, the largest expenses are those associated with harvesting and postharvesting activities (i.e., postharvesting costs include marketing costs). The difference in costs associated with the low and moderate IPM scenarios is about \$2,000 per acre. Depending on the IPM scenario, costs associated with the fungicides and insecticides represent anywhere between 2 percent and 5 percent of total costs.

We also evaluated two different marketing strategies using the Excel sample blueberry budget: 1) 100 percent retail (e.g., on-farm or at farmers markets); and 2) 50 percent PYO and 50 percent ready-picked to be marketed on-farm, at roadside stands or at farmers markets. We assume a moderate IPM strategy in both marketing scenarios. As you can see in Tables 7 and 8, when switching from the 100 percent retail scenario to the 50 percent PYO and 50 percent retail scenario, harvesting costs go from representing about 28 percent of total costs to representing about 18 percent of total costs. Regardless of IPM and marketing strategy used, mulch application, harvesting and postharvesting costs are the largest expenses associated with blueberry production.

Table 6. Estimated Costs for 100 Percent Ready-picked Blueberries Retail, Low IPM

| | Year 0 | % | Year 1 | % | Year 2 | % | Year 3 | % | Year 4 | % | Year 5 | % | Year 6 | % | Year 7 | % | Total | % |
|------------------------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|
| Planting/Replanting | \$0.00 | 0.00% | \$3,625.39 | 73.40% | \$153.09 | 5.28% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$3,778.48 | 5.15% |
| Remove Fruit Buds and Prune | \$0.00 | 0.00% | \$119.40 | 2.42% | \$74.40 | 2.57% | \$297.60 | 7.30% | \$446.40 | 4.44% | \$744.00 | 5.76% | \$744.00 | 4.46% | \$744.00 | 4.94% | \$3,169.80 | 4.32% |
| Front-end Loader | \$23.43 | 0.34% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$23.43 | 0.03% |
| Disk | \$20.91 | 0.31% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$20.91 | 0.03% |
| Subsoiler | \$15.78 | 0.23% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$15.78 | 0.02% |
| Construct Beds | \$95.46 | 1.40% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$95.46 | 0.13% |
| Fertilizer | \$193.38 | 2.84% | \$163.26 | 3.31% | \$140.79 | 4.86% | \$140.79 | 3.45% | \$140.79 | 1.40% | \$140.79 | 1.09% | \$140.79 | 0.84% | \$140.79 | 0.94% | \$1,201.37 | 1.64% |
| Sulfur Application | \$254.13 | 3.73% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$254.13 | 0.35% |
| Fungicides/Insecticides | \$0.00 | 0.00% | \$214.49 | 4.34% | \$214.49 | 7.40% | \$214.49 | 5.26% | \$214.49 | 2.13% | \$214.49 | 1.66% | \$214.49 | 1.29% | \$214.49 | 1.42% | \$1,501.41 | 2.04% |
| Soil Testing | \$133.35 | 1.96% | \$22.44 | 0.45% | \$22.44 | 0.77% | \$22.44 | 0.55% | \$22.44 | 0.22% | \$22.44 | 0.17% | \$22.44 | 0.13% | \$22.44 | 0.15% | \$290.43 | 0.40% |
| Mowing | \$0.00 | 0.00% | \$80.13 | 1.62% | \$80.13 | 2.77% | \$80.13 | 1.97% | \$80.13 | 0.80% | \$80.13 | 0.62% | \$80.13 | 0.48% | \$80.13 | 0.53% | \$560.89 | 0.76% |
| Seed Grass | \$45.25 | 0.66% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$45.25 | 0.06% |
| Irrigation | \$258.00 | 3.79% | \$400.60 | 8.11% | \$400.60 | 13.82% | \$400.60 | 9.82% | \$400.60 | 3.98% | \$400.60 | 3.10% | \$400.60 | 2.40% | \$400.60 | 2.66% | \$3,062.20 | 4.17% |
| Incorporating Mulch | \$5,551.76 | 81.49% | \$0.00 | 0.00% | \$1,565.26 | 54.01% | \$0.00 | 0.00% | \$1,565.26 | 15.55% | \$0.00 | 0.00% | \$1,565.26 | 9.39% | \$0.00 | 0.00% | \$10,247.53 | 13.96% |
| Harvest | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$992.00 | 24.33% | \$2,976.00 | 29.57% | \$4,940.16 | 38.26% | \$5,952.00 | 35.71% | \$5,952.00 | 39.54% | \$20,812.16 | 28.34% |
| Postharvest | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$1,519.93 | 37.28% | \$3,606.60 | 35.84% | \$5,672.40 | 43.93% | \$6,736.60 | 40.42% | \$6,736.60 | 44.75% | \$24,272.13 | 33.06% |
| Financial | \$192.53 | 2.83% | \$129.75 | 2.63% | \$67.93 | 2.34% | \$86.45 | 2.12% | \$266.48 | 2.65% | \$353.55 | 2.74% | \$466.59 | 2.80% | \$418.42 | 2.78% | \$1,981.69 | 2.70% |
| Operator/Unpaid Family Labor | \$28.67 | 0.42% | \$183.58 | 3.72% | \$178.74 | 6.17% | \$322.95 | 7.92% | \$344.54 | 3.42% | \$344.54 | 2.67% | \$344.54 | 2.07% | \$344.54 | 2.29% | \$2,092.09 | 2.85% |
| Total Costs | \$6,812.64 | 100.00% | \$4,939.03 | 100.00% | \$2,897.86 | 100.00% | \$4,077.38 | 100.00% | \$10,063.71 | 100.00% | \$12,913.09 | 100.00% | \$16,667.43 | 100.00% | \$15,054.01 | 100.00% | \$73,425.14 | 100.00% |

Table 7. Estimated Costs for 100 Percent Ready-picked Blueberries Retail, Moderate IPM

| | Year 0 | % | Year 1 | % | Year 2 | % | Year 3 | % | Year 4 | % | Year 5 | % | Year 6 | % | Year 7 | % | Total | % |
|------------------------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|
| Planting/Replanting | \$0.00 | 0.00% | \$3,625.39 | 69.39% | \$153.09 | 4.81% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$3,778.48 | 5.01% |
| Remove Fruit Buds and Prune | \$0.00 | 0.00% | \$119.40 | 2.29% | \$74.40 | 2.34% | \$297.60 | 6.82% | \$446.40 | 4.31% | \$744.00 | 5.64% | \$744.00 | 4.39% | \$744.00 | 4.85% | \$3,169.80 | 4.20% |
| Front-end Loader | \$23.43 | 0.34% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$23.43 | 0.03% |
| Disk | \$20.91 | 0.31% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$20.91 | 0.03% |
| Subsoiler | \$15.78 | 0.23% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$15.78 | 0.02% |
| Construct Beds | \$95.46 | 1.40% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$95.46 | 0.13% |
| Fertilizer | \$193.38 | 2.84% | \$163.26 | 3.12% | \$140.79 | 4.42% | \$140.79 | 3.23% | \$140.79 | 1.36% | \$140.79 | 1.07% | \$140.79 | 0.83% | \$140.79 | 0.92% | \$1,201.37 | 1.59% |
| Sulfur Application | \$254.13 | 3.73% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$254.13 | 0.34% |
| Fungicides/Insecticides | \$0.00 | 0.00% | \$495.89 | 9.49% | \$495.89 | 15.58% | \$495.89 | 11.37% | \$495.89 | 4.79% | \$495.89 | 3.76% | \$495.89 | 2.93% | \$495.89 | 3.23% | \$3,471.24 | 4.60% |
| Soil Testing | \$133.35 | 1.96% | \$22.44 | 0.43% | \$22.44 | 0.70% | \$22.44 | 0.51% | \$22.44 | 0.22% | \$22.44 | 0.17% | \$22.44 | 0.13% | \$22.44 | 0.15% | \$290.43 | 0.39% |
| Mowing | \$0.00 | 0.00% | \$80.13 | 1.53% | \$80.13 | 2.52% | \$80.13 | 1.84% | \$80.13 | 0.77% | \$80.13 | 0.61% | \$80.13 | 0.47% | \$80.13 | 0.52% | \$560.89 | 0.74% |
| Seed Grass | \$45.25 | 0.66% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$45.25 | 0.06% |
| Irrigation | \$258.00 | 3.79% | \$400.60 | 7.67% | \$400.60 | 12.58% | \$400.60 | 9.18% | \$400.60 | 3.87% | \$400.60 | 3.04% | \$400.60 | 2.36% | \$400.60 | 2.61% | \$3,062.20 | 4.06% |
| Incorporating Mulch | \$5,551.76 | 81.49% | \$0.00 | 0.00% | \$1,565.26 | 49.17% | \$0.00 | 0.00% | \$1,565.26 | 15.12% | \$0.00 | 0.00% | \$1,565.26 | 9.23% | \$0.00 | 0.00% | \$10,247.53 | 13.59% |
| Harvest | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$992.00 | 22.74% | \$2,976.00 | 28.76% | \$4,940.16 | 37.43% | \$5,952.00 | 35.11% | \$5,952.00 | 38.80% | \$20,812.16 | 27.59% |
| Postharvest | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$1,519.93 | 34.84% | \$3,606.60 | 34.85% | \$5,672.40 | 42.98% | \$6,736.60 | 39.74% | \$6,736.60 | 43.92% | \$24,272.13 | 32.18% |
| Financial | \$192.53 | 2.83% | \$133.74 | 2.56% | \$71.92 | 2.26% | \$90.45 | 2.07% | \$270.47 | 2.61% | \$357.54 | 2.71% | \$470.58 | 2.78% | \$422.42 | 2.75% | \$2,009.64 | 2.66% |
| Operator/Unpaid Family Labor | \$28.67 | 0.42% | \$183.58 | 3.51% | \$178.74 | 5.62% | \$322.95 | 7.40% | \$344.54 | 3.33% | \$344.54 | 2.61% | \$344.54 | 2.03% | \$344.54 | 2.25% | \$2,092.09 | 2.77% |
| Total Costs | \$6,812.64 | 100.00% | \$5,224.43 | 100.00% | \$3,183.26 | 100.00% | \$4,362.78 | 100.00% | \$10,349.11 | 100.00% | \$13,198.49 | 100.00% | \$16,952.82 | 100.00% | \$15,339.40 | 100.00% | \$75,422.92 | 100.00% |

Table 8. Estimated Costs for 50 Percent PYO and 50 Percent Ready-picked Blueberries Retail, Moderate IPM

| | Year 0 | % | Year 1 | % | Year 2 | % | Year 3 | % | Year 4 | % | Year 5 | % | Year 6 | % | Year 7 | % | Total | % |
|------------------------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|
| Planting/Replanting | \$0.00 | 0.00% | \$3,625.39 | 69.39% | \$153.09 | 4.81% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$3,778.48 | 6.45% |
| Remove Fruit Buds and Prune | \$0.00 | 0.00% | \$119.40 | 2.29% | \$74.40 | 2.34% | \$297.60 | 8.36% | \$446.40 | 5.62% | \$744.00 | 8.09% | \$744.00 | 6.13% | \$744.00 | 7.07% | \$3,169.80 | 5.41% |
| Front-end Loader | \$23.43 | 0.34% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$23.43 | 0.04% |
| Disk | \$20.91 | 0.31% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$20.91 | 0.04% |
| Subsoiler | \$15.78 | 0.23% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$15.78 | 0.03% |
| Construct Beds | \$95.46 | 1.40% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$95.46 | 0.16% |
| Fertilizer | \$193.38 | 2.84% | \$163.26 | 3.12% | \$140.79 | 4.42% | \$140.79 | 3.95% | \$140.79 | 1.77% | \$140.79 | 1.53% | \$140.79 | 1.16% | \$140.79 | 1.34% | \$1,201.37 | 2.05% |
| Sulfur Application | \$254.13 | 3.73% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$254.13 | 0.43% |
| Fungicides/Insecticides | \$0.00 | 0.00% | \$495.89 | 9.49% | \$495.89 | 15.58% | \$495.89 | 13.93% | \$495.89 | 6.25% | \$495.89 | 5.39% | \$495.89 | 4.09% | \$495.89 | 4.71% | \$3,471.24 | 5.93% |
| Soil Testing | \$133.35 | 1.96% | \$22.44 | 0.43% | \$22.44 | 0.70% | \$22.44 | 0.63% | \$22.44 | 0.28% | \$22.44 | 0.24% | \$22.44 | 0.18% | \$22.44 | 0.21% | \$290.43 | 0.50% |
| Mowing | \$0.00 | 0.00% | \$80.13 | 1.53% | \$80.13 | 2.52% | \$80.13 | 2.25% | \$80.13 | 1.01% | \$80.13 | 0.87% | \$80.13 | 0.66% | \$80.13 | 0.76% | \$560.89 | 0.96% |
| Seed Grass | \$45.25 | 0.66% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$45.25 | 0.08% |
| Irrigation | \$258.00 | 3.79% | \$400.60 | 7.67% | \$400.60 | 12.58% | \$400.60 | 11.25% | \$400.60 | 5.05% | \$400.60 | 4.35% | \$400.60 | 3.30% | \$400.60 | 3.81% | \$3,062.20 | 5.23% |
| Incorporating Mulch | \$5,551.76 | 81.49% | \$0.00 | 0.00% | \$1,565.26 | 49.17% | \$0.00 | 0.00% | \$1,565.26 | 19.71% | \$0.00 | 0.00% | \$1,565.26 | 12.90% | \$0.00 | 0.00% | \$10,247.53 | 17.49% |
| Harvest | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$496.00 | 13.93% | \$1,488.00 | 18.74% | \$2,470.08 | 26.85% | \$2,976.00 | 24.52% | \$2,976.00 | 28.29% | \$10,406.08 | 17.77% |
| Postharvest | \$0.00 | 0.00% | \$0.00 | 0.00% | \$0.00 | 0.00% | \$1,237.27 | 34.76% | \$2,758.60 | 34.74% | \$4,264.72 | 46.36% | \$5,040.60 | 41.54% | \$5,040.60 | 47.91% | \$18,341.79 | 31.31% |
| Financial | \$192.53 | 2.83% | \$133.74 | 2.56% | \$71.92 | 2.26% | \$66.11 | 1.86% | \$197.47 | 2.49% | \$236.36 | 2.57% | \$324.58 | 2.67% | \$276.42 | 2.63% | \$1,499.13 | 2.56% |
| Operator/Unpaid Family Labor | \$28.67 | 0.42% | \$183.58 | 3.51% | \$178.74 | 5.62% | \$322.95 | 9.07% | \$344.54 | 4.34% | \$344.54 | 3.75% | \$344.54 | 2.84% | \$344.54 | 3.27% | \$2,092.09 | 3.57% |
| Total Costs | \$6,812.64 | 100.00% | \$5,224.43 | 100.00% | \$3,183.26 | 100.00% | \$3,559.78 | 100.00% | \$7,940.11 | 100.00% | \$9,199.55 | 100.00% | \$12,134.82 | 100.00% | \$10,521.40 | 100.00% | \$58,575.98 | 100.00% |



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