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MICHIGAN STATE Extension



EXECUTIVE SUMMARY

The costs of highbush blueberry production in Michigan topped \$10,000 per acre in 2024, with costs nearly matching revenues for the average blueberry field in Michigan. While this means that the average grower in Michigan is operating at an economic breakeven, about \$240 per acre for management was included in our budget as a labor cost. This management cost represents income for growers who directly manage their fields.

Annual input costs to grow blueberries, including pruning, fertilizing, and crop protection, make up about 29% of total costs. Harvest-related costs, such as picking and fresh packing, are responsible for nearly 56% of the total costs of production. The remaining 15% of total costs are due to operating interest, land control, and establishment expenses. Field establishment costs for planting and for the nonbearing years are estimated to total \$23,956 per acre.

Fixed costs related to machinery and equipment, land, and packing shed overhead comprise at least 12% of total costs. However, we found most production costs to be variable and therefore susceptible to input shocks. For example, skilled and manual labor costs, which have been rising due to higher salary rates for workers, make up around 42% of full production costs.

The blueberry industry is moving toward greater levels of production for the fresh market, with growers selecting cultivars and production techniques for this market. The use of machines for harvesting fresh-oriented blueberries is becoming more common, up to 20% of harvested production. While up to 75% of blueberries may be intended for fresh marketing, weather conditions and sort-outs from the packing line divert many of these to processing/frozen uses, depending on annual conditions. Due to these diversions, the current industry split is approximately 54% fresh and 46% processed.¹

Many growers are moving toward a highinput strategy in order to produce higher profits. Such a strategy often involves the use of improved varieties that provide quality benefits, as well as higher quantities of mulches at planting, foliar feeding, drip irrigation, and other methods to boost yield.

The percentages for each major cost and production category are illustrated in Figure 1. The majority of costs are related to harvest and packing (including packing infrastructure).

¹ Noncitrus Fruits and Nuts 2023 Summary. United States Department of Agriculture, National Agricultural Statistics Service (USDA-NASS), May, 2024. <u>https://downloads.usda.library.cornell.edu/usda-esmis/files/zs25x846c/6682zt197/qf85q241d/ncit0524.pdf</u>



Figure 1. Costs of highbush blueberry production in Michigan, as a percentage by category.

INTRODUCTION

Blueberries are one of Michigan's top three fruits, when measured by acreage or volume of production. Blueberries are native to Michigan, and long before European settlers arrived. Native American populations gathered blueberries for food and medicinal purposes.² The state's favorable climate and soil conditions, combined with ongoing research and development, have made it an ideal location for blueberry cultivation. Over the years, Michigan's blueberry industry has grown and evolved, with advancements in farming techniques and technology helping to increase yields and improve fruit quality. Today, Michigan is a top producer of blueberries for the United States, with 87 million pounds harvested on 16,900 acres in 2023 – 54% of which were sold in the fresh blueberry market.³ Official numbers for 2024 are not available at the time of this writing, but estimates suggest about 80 million pounds were used. The blueberry industry is a significant part of Michigan's agricultural economy, providing jobs and supporting local communities, especially in west-central and southwest Michigan.

Blueberry plants take about 8 years to grow to maturity and can be cultivated nearly indefinitely if managed well. There are blueberry fields as old as 90 years currently in production in Michigan, with 50-yearold fields not uncommon. However, many long-standing fields are being removed and replaced with new cultivars due to declining yields and infestation (of Jersey and some other cultivars) by a pest insect, the blueberry stem gall wasp. This insect infects the shoots of susceptible cultivars. Replacement with the many resistant cultivars can eliminate this pest problem and avoid the costs of control through pruning and treatment. For this

² For more on the history of Michigan blueberries, see <u>https://www.canr.msu.edu/uploads/files/</u> <u>The_Michigan_Blueberry_Industry_2012_MSUE_online.pdf</u>

³ Noncitrus Fruits and Nuts 2023 Summary. United States Department of Agriculture, National Agricultural Statistics Service (USDA-NASS), May, 2024. <u>https://downloads.usda.library.cornell.</u> <u>edu/usda-esmis/files/zs25x846c/6682zt197/qf85q241d/ncit0524.pdf</u>

study, we assumed a 33-year lifetime for the average Michigan blueberry field, with three nonbearing early years and 30 bearing years. While plants can certainly live longer, growers are likely to upgrade their cultivars for pest, yield, and marketing purposes much before the end of their potential life.

As much as 75% of Michigan blueberry acreage is cultivated and harvested for the fresh market. The majority of these berries are hand-harvested, requiring thousands of farm workers to pick the fruit. The use of machines for fresh-oriented harvesting is increasing as technology improves, currently comprising up to 20% of production. Using certain pruning techniques, specific varieties and cultivars lend themselves to more effective machine harvesting. The berries for the fresh market are run over packing lines and then sent out quickly to retailers in refrigerated transportation.

The remainder of blueberries are harvested by machine, directly for the frozen/processing market. Some cultivars are harvested only for this market, but many processing berries are from the later harvests of a field, when the berry size tends to be smaller. Additionally, blueberries from the fresh line that do not make premium grade can also be diverted to processing. Currently, about 46% of Michigan's harvested blueberry crop goes to processing and frozen packing. The amount of processing-oriented production is likely to decline as growers plant new varieties intended for the fresh market.

For this study, we use 5,500 pounds as the average yield per acre, which is close to the statewide average. However, high input strategies, often using newer plant cultivars, can lead to significantly higher yields given the right growing conditions. Since many growers are pivoting to use these strategies, we have included a section in this report analyzing the costs and benefits of this approach. Less than 1% of blueberry production in Michigan is certified organic. Challenges with pests and diseases in Michigan's relatively humid environment make it challenging to grow organically. However, some smallerscale growers are completely organic in their production practices, mostly serving local markets.

METHODS/ INFORMATION SOURCES

The data gathering and analysis for this project took place from winter 2024 through winter 2025. In early 2024, regional MSU Extension educators, growers, and other key industry members were interviewed to gain a better understanding of blueberry production, gather existing spreadsheets and data, and identify a larger pool of growers to connect with. In February of 2024, two focus group meetings were held to gather data and identify issues. After some preliminary analysis, data gaps became apparent, so further data was gathered in spring and again later in fall 2024. Data was compiled and put into spreadsheet form in late 2024 and finalized in early 2025. This report was developed and sent to several growers and MSU Fruit Team members for review.

ASSUMPTIONS

This study looks broadly at Michigan blueberry production across the major growing regions, which are in southwest and west-central Michigan. It is assumed that farms have a workshop for equipment maintenance and the necessary storage for crop protectants and other inputs. It is also assumed that the farm has access to basic equipment such as discs for occasional tillage and seeders for planting row middles

at establishment, plus sprayers for treating fields for crop protection. Based on our findings across farms and regions, we use the following assumptions as averages for computations:

A

- Field density is 1452 plants per acre, using a 3' x 10' spacing;
- Food safety costs are \$60 per acre;
- Average harvest split across industry is 40% fresh hand-picked, 20% machinepicked for fresh, 40% machine-harvested for processed/frozen;
- Average crop insurance cost is \$85 per acre;
- Average fresh packout for hand-picked product is 85% of harvested pounds;
- Machine-picked, fresh packout is 70% of harvested pounds;
- Commodity group fees total \$0.012 / lb. (USHBC at \$0.009 + MBC at \$0.003);
- Life of a field is considered 33 total years, 30 of which are bearing;
- Full production starts at Year 8;
- Full production is 5,500 pounds per acre;
- Processing price for berries is \$0.46 per lb., dock price to the grower (dropped at processor's dock); and
- The price for finished, packed fresh product is \$2.74 lb., including marketing fees (\$2.56 without).

Figure 2. Average yields (harvested pounds per acre) over the life of a Michigan blueberry field.



EQUIPMENT

The equipment used in blueberry production has been somewhat similar across years. Narrow tractors with cabs are coupled with Airblast or tower sprayers, and smaller tractors are used for mowing and other tasks. There have been some advances in machine harvesters that reduce soft fruit by using rotary heads, but the overall machine harvest process has not changed substantially.

Equipment costs were calculated on a perhour basis for both fixed (purchase) costs and variable costs (fuel, repairs, and maintenance). Adjustments were made for the expected life and eventual salvage value of the equipment. Table 1 illustrates many of the main pieces of equipment used in blueberry production and some average costs in 2024. Details of our equipment calculations can be found in Table 11 in the Appendix.

Table 1. Equipment used in blueberryproduction in Michigan.

Equipment Type	Purchase Price				
85 HP 4WD tractor with	\$85,000				
cab					
60 HP 2WD tractor/forklift	\$60,000				
Airblast sprayer	\$47,000				
Weed sprayer	\$15,000				
Fertilizer spreader – pull	\$25,000				
type					
Rotary mower	\$8,000				
Flail chopper	\$10,000				
Machine harvester	\$250,000				
Mulch spreader	\$28,000				

LABOR

Even with advancements in sorting and harvesting technology, blueberries remain one of Michigan's most labor-intensive crops, providing an important source of both long-term and seasonal work in western Michigan. About 42% of the total costs of full production are attributable to manual labor (e.g., pruning, planting, harvesting) and skilled labor (tractor, truck, and other equipment driving). Hand picking alone accounts for over half of these labor costs.

Labor costs vary across farms. Most growers and packers employ domestic workers for manual labor and skilled labor needs. In many cases, but not all, housing is provided by employers to these workers, especially for the temporary seasonal workers during the harvest season. Labor costs also vary because some growers work with the H-2A visa program.

For this study, growers reported their total labor costs for picking labor and for packing labor. These included any applicable housing costs. This method enabled us to compare these important manual harvest costs across farms despite variances in the type of labor used by individual operations (domestic labor, H-2A, or a mix). Rates for skilled and other types of manual labor, both more often done by year-round employees, had greater consensus among respondents. The rates were \$33 for skilled workers and \$26 for other manual workers, including Federal Insurance Contributions Act (FICA) and other benefits.



Photograhy by Chris Bardenhagen, MSU Mulched blueberry field in early spring just before pruning.

FIELD ESTABLISHMENT, YEARS 0-3

Establishment costs during the nonbearing years (the total across Year 1 to Year 3) were \$23,956 per acre. These include land preparation, planting, and cultivation. Additionally, we allocated a percentage of the cost of Year 4 through Year 7 based on those years being only partially bearing. This added \$3,548, making a grand total for establishment costs of \$27,504 per acre (see Table 12 in the Appendix for more details). We divide this total by 30 production years, with the resulting \$917 being allocated to each of the full bearing years to cover establishment costs. Note that these numbers are based on average Michigan costs; some growers are using higher-priced plant genetics, which can raise establishment costs considerably (see the "High-input Fresh-oriented Strategy" section below).

Land preparation. Preplant costs and irrigation setup costs make up \$8,447 of the establishment budget (see Table 2 below). Land clearing is a substantial cost. Many growers use grinders to clear the plants, but many root balls can remain and require removal. Custom grinding is an option to remove the roots, but costs can near \$1,800 per acre. Either way, picking roots and rocks will be required. In some cases, soils need further acidification after land clearing, so amendments with sulfur will be added. In many cases, tiling also needs to be installed for drainage purposes once the land is cleared.

Irrigation system setup is a substantial cost for blueberries. First, most growers put in solid-set irrigation for frost protection. Frost fans are an option at some sites, but those carry substantial costs as well. Drip irrigation is the most expensive aspect of the irrigation system, in part because it is needed for

every row, and in some cases, double lines are installed. Between materials, piping to the rows, and labor to set out lines properly, growers allocate about \$3,000 for the drip irrigation layout. An additional \$1,000 per acre is also needed to help replace or fund new irrigation pumps.

Mulching. Mulching is done by most growers at field establishment. Wood chips or sawdust are spread and incorporated directly into the middle of the row where the bushes will be planted. Once the bushes are planted, many growers also continue to spread mulch during the growing and production years. However, the amounts needed for this practice are substantial and the cost is becoming prohibitive in some cases, with mulch becoming more expensive and harder to find. The availability of mulch varies by region and may depend on connections with municipal or private suppliers.

Planting. Bush costs were found to be an average of \$5 a potted bush. Some growers have their own nurseries and propagate the plants from cuttings, but then incur extra expenses related to raising the plants. Some growers are paying additional royalty fees and planting more expensive club varieties.

Once the land is prepared, a deep tiller or plow is used to create a furrow where the plants are placed. A tractor is used to transport plants to the field, but most of the planting work is done by hand, totaling 26 hours per acre (Table 2). After planting the bushes, the row middles are planted with a perennial grass cover crop for tractor driving, natural weed suppression, and erosion control.



Blueberry bushes becoming ripe in summer.

Table 2. Pre-plant and planting costs for Michigan blueberries.

ESTABLISHMENT COSTS	Time	Labor Rate	Materials	Equipment F	Rate	Subtotal	TOTAL
	Hours/ Acre	\$/Hour	or Custom Cost \$/Acre	\$/Hour Variable (cash)	\$/Hour, Fixed (non- cash)	\$/Acre	\$/Acre
Pre-plant							
Land Clearing			\$1,000.00			\$1,000.00	
Roots and Rocks	8.0	\$26.00				\$208.00	
85 HP tractor (with trailer)	0.8	\$33.00		\$14.37	\$17.82	\$52.15	
Soil samples			\$10.00			\$10.00	
Disking - \$16 per acre, twice			\$32.00			\$32.00	
Mulching \$6/yard x 60 yards	2.0	\$33.00	\$360.00			\$426.00	
60HP tractor	2.0			\$9.45	\$8.77	\$36.44	
Mulch spreader	2.0			\$9.33	\$81.89	\$182.44	
Irrigation Solid set			\$1,500.00			\$1,500.00	
Allocation for pump			\$1,000.00			\$1,000.00	
Drip setup			\$3,000.00			\$3,000.00	
Tiling			\$1,000.00			\$1,000.00	
					Total Pre-p	lant costs	\$8,447
Planting							
Bush costs							
\$5 bush x 1452 per acre			\$7,260.00			\$7,260.00	
Planting	26.0	\$26.00				\$676.00	
60 HP tractor to carry plants	2.0	\$33.00		\$9.45	\$8.77	\$102.44	
Seeding grass middles	0.3	\$33.00	\$60.00			\$69.90	
60 HP tractor	0.3			\$9.45	\$8.77	\$5.47	
Spreader	0.3			\$1.67	\$12.74	\$4.32	
Fertilizer (dry only)	0.4	\$33.00	\$100.00			\$113.20	
60 HP tractor	0.4			\$9.45	\$8.77	\$7.29	
Spreader-Pull Type	0.4			\$1.67	\$12.74	\$5.76	
Land control costs			\$375.00			\$375.00	
Real estate tax			\$100.00			\$100.00	
Management	6.0	\$40.00				\$240.00	
Operating interest							
8% APR on costs for 6 months			\$696.26			\$696.26	
					Total Plant	ting costs	\$9,656

Nonbearing years. In the first three years after planting, growers do not usually harvest any fruit. In fact, growers strategically prune so as to direct maximum plant energy toward growth. They may also deflower the plants to prevent fruiting. Early pruning, plant training, and deflowering activities require about 6 hours per acre per year (Table 3).

Table 3. Nonbearing year cost breakdown for Michigan blueberries.

ESTABLISHMENT COSTS	Time	Labor Rate	Materials	Equipment	t Rate	Subtotal	TOTAL
	Hours/ Acre	\$/Hour	or Custom Cost \$/ Acre	\$/Hour Variable (cash)	\$/Hour, Fixed (non-cash)	\$/Acre	\$/Acre
Growing Years 1 - 3							
Soil Aeration	0.2	\$33.00				\$6.60	
60 HP tractor	0.2			\$9.45	\$8.77	\$3.64	
Irrigation Operation			\$167.00			\$167.00	
Pruning, training & deflowering	6.0	\$26.00				\$156.00	
Brush Chopping	0.5	\$33.00				\$16.50	
85 HP tractor	0.5			\$14.37	\$17.82	\$16.09	
Flail mower	0.5			\$0.42	\$4.37	\$2.39	
Hand weeding	5.0	\$26.00				\$130.00	
Fertilizer (includes dry + liquid)	0.4	\$33.00	\$200.00			\$213.20	
60 HP tractor	0.4			\$9.45	\$8.77	\$7.29	
Spreader	0.4			\$1.67	\$12.74	\$5.76	
Mowing							
3 trips/year at .25 hours/trip	0.75	\$33.00				\$24.75	
60 HP tractor	0.75			\$9.45	\$8.77	\$13.67	
Rotary Mower	0.75			\$0.27	\$2.79	\$2.30	
Crop Protection							
Materials, 46% of full program			\$151.06			\$151.06	
Total for 7 trips/year	1.0	\$33.00				\$33.00	
85 HP tractor	1.0			\$14.37	\$17.82	\$32.19	
Airblast Sprayer	1.0			\$7.51	\$10.31	\$17.82	
Herbicide							
3 trips/year at .3 hours/trip	0.9	\$33.00	\$123.30			\$153.00	
60 HP tractor	0.9			\$9.45	\$8.77	\$16.40	
Weed sprayer	0.9			\$0.63	\$4.78	\$4.86	
Porta-potties			\$12.00			\$12.00	
Land control costs			\$375.00			\$375.00	
Real estate tax			\$100.00			\$100.00	
Management	6.0	\$40.00				\$240.00	
Operating interest							
8% APR on costs avg 4 months			\$50.68			\$50.68	
				Total Nonh	earing Costs	ner Vear	\$1 951

During these early years, hand weeding is usually needed while the plants start to grow and begin to create a canopy. Mowing is used to cut the grass strips and manage weeds up to the drip line. Fertilizer programs during these early years can vary based on farm and soil types, but on average, they are less costly than during production years.

MICHIGAN STATE UNIVERSITY EXTENSION

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PRODUCTION

We found that growing activities and inputs make up about 29% of the total cost of production. These include pruning, mowing, spraying, fertilizing, and bees, among other things (Table 4). Most of the production and cultural activities have been similar across the years, but prices for these inputs have increased.

Table 4. Costs related to the growing of Michigan blueberries.

Operating and harvest costs, and cost totals for Blueberry production in 2024									
Based on average over 30-year bearing lifetime									
	Time	Labor Rate	Materials	Equipn	nent Rate	Subtotal	TOTALS		
OPERATING COSTS	Hours/ Acre	\$/Hour	or Custom Cost \$/ Acre	\$/Hour variable (cash)	\$/Hour fixed (Deprec.)	\$/Acre	\$/Acre		
Pruning and brush disposal							\$837		
-Pruning labor (\$0.54 x 1452 plants)1			\$784.08			\$784.08			
-85 HP Tractor for Brush Disposal	0.75	\$33.00		\$14.37	\$17.82	\$48.89			
-Flail Chopper	0.75			\$0.42	\$4.37	\$3.59			
Soil aeration							\$10		
-60 HP tractor	0.2	\$33.00		\$9.45	\$8.77	\$10.24			
Mowing Total for 3 trips per year							\$41		
-60 HP tractor	0.75	\$33.00		\$9.45	\$8.77	\$38.42			
-Rotary mower	0.75			\$0.27	\$2.79	\$2.30			
Irrigation							\$270		
-Irrigation operation costs/ year			\$250.00			\$250.00			
-Frost protection costs/year			\$20.00			\$20.00			
Crop protection Total for 13 trips per y	ear						\$478		
-85 HP tractor	1.8	\$33.00		\$14.37	\$17.82	\$117.34			
-Orchard Sprayer	1.8			\$7.51	\$10.31	\$32.08			
-Total material costs			\$328.40			\$328.40			
Herbicide Total for 3 trips per year							\$174		
-60 HP tractor	0.9	\$33.00		\$9.45	\$8.77	\$46.10			
-Weed sprayer	0.9			\$0.63	\$4.78	\$4.86			
-Total material costs			\$123.30			\$123.30			
Fertilizer							\$462		
-60 HP Tractor for dry app 2x /year	0.4	\$33.00		\$9.45	\$8.77	\$20.49			
-Spreader	0.4			\$1.67	\$12.74	\$5.76			
-Dry application material costs			\$190.00			\$190.00			
-Liquid/fertigation material costs2			\$150.00			\$150.00			
-Foliar materials			\$96.00			\$96.00			

Table 4. Costs related to the growing of Michigan blueberries (continued).

	Time	Labor Rate	Materials	Equipment Rate		Subtotal	TOTALS
OPERATING COSTS	Hours/ Acre	\$/Hour	or Custom Cost \$/ Acre	\$/Hour variable (cash)	\$/Hour fixed (Deprec.)	\$/Acre	\$/Acre
Other Operating							\$738
Bees 3.5 hives per acre @ \$68/hive			\$238.00			\$238.00	
Soil testing once per 3 years @ \$10/ acre			\$3.33			\$3.33	
Crop insurance			\$85.00			\$85.00	
Food safety compliance			\$60.00			\$60.00	
Porta-potties			\$12.00			\$12.00	
Management and labor supervision	6.0	\$40.00				\$240.00	
Property taxes per acre			\$100.00			\$100.00	
				то	TAL OPERAT	ING COSTS	\$3,010

1 Pruning, picking, and packing labor are based on interview and focus group estimates, inclusive of domestic and/or H2A labor costs. 2 Foliar materials are applied with crop protectants, so it is assumed there are no substantial additional application costs.

Pruning. Pruning practices vary by farm, variety, and marketing strategy. A detailed pruning may be done every other year for some blocks, or a lighter pruning each year. Varieties that have the potential to be harvested by machine for the fresh market require more regular and detailed pruning. Many growers use a per-bush approach, paying pruners by the piece. On average, across different approaches, we found pruning costs to be about \$0.54 per bush, or \$784 per acre.

The brush from pruning is generally chopped with a flail chopper or another type of mower. However, if growers find a substantial amount of canker, they will cut the diseased branches out and remove them from the field to prevent spread of this disease.

Fertilizer. Fertilization is moving away from the use of simpler formulations such as 14-7-7 (although they are still used). Diammonium phosphate or similar is used to reduce pH while also delivering available nitrogen. Increasingly, growers are using specific, sophisticated formulations tailored to their soil needs based on testing. Growers are relying less on dry fertilizer and more on liquid fertilizers applied through drip lines and foliar inputs that are included with crop protection sprays. Table 5 illustrates average fertilizer costs for Michigan fields.

Table 5. Annual average fertilizer costs formature Michigan blueberry fields.

FERTILIZER COSTS									
Harvest Years	Cost per acre								
Dry Fertilizers	\$190								
Liquid/Fertigation	\$150								
Foliar Materials	\$96								
Total	\$436.00								

Weed management. Weed management costs can vary by approach. Most growers use three applications of herbicide per year, including a pre-emergent application made in fall or early spring, and in-season applications to stop growth of the specific weeds present in each field. Some use weed mat fabric, which can help lower the need for spray applications. Herbicide costs do not vary substantially across varieties because, unlike pest pressure, weeds continue to have economic consequences after harvest and into the fall.

Crop protectant costs and program. Crop protectant costs do vary across varieties, with mid- and late-season varieties requiring more costs and applications than the early-season ripening bushes that need less pest control. Using grower spray records, we were able to assess these seasonal differences (Table 6) in the insecticide, fungicide, and herbicide costs.

Table 6. Crop protectant costs for pest anddisease management in Michigan blueberryfields.

Crop Protection Program Cost Averages							
Variety type	Averages						
Early Season	\$250.52						
Mid Season	\$298.28						
Late Season	\$436.40						
AVERAGE FULL SEASON	\$328.40						

As part of this study, we developed a sample spray program. See Table 13 in the Appendix for this example spray program.

HARVEST

Of the total production costs, 56% are related to harvest and packing. Both of these activities require a substantial amount of labor. We found that currently, the average split in Michigan between different harvest methods was 40% hand-picked fresh, 20% machine-picked fresh, and 40% machine-harvested processed. With an average yield of 5,500 pounds, this equates to 2,200 lbs, 1,100 lbs, and 2,200 lbs per acre, respectively. Each of these harvesting methods has a different cost, detailed in Table 7 below. Depending on the variety and the growing season, a field might be hand-picked two or three times, followed by machine picking for cleanup.

Picked versus packed pounds. Growers stated that their estimate of average yields is based on the pounds for which they are paid. It is important to note that for fresh blueberries, this generally means packed pounds, but for processed blueberries, numbers are based on dock weight (pounds delivered to the processor).

To account for the true harvest costs, the formula we used is:

Harvested pounds x packout % = packed pounds.

An average packout of 85% was assumed for hand-picked blueberries going over the fresh packing line, based on packer feedback. This means it takes 2,588 handpicked pounds to yield 2,200 finished, packed pounds.

For machine-picked product going over the fresh packing line, a 70% packout average was used. This results in needing 1,571 pounds of machine-picked blueberries to yield 1,100 finished, packed pounds.

Hand Harvest. Hand harvesting is an intensive process due to the berries being small and delicate. Also, hand picking requires the workers to discern between ripe and nonripe blueberries. Further, each field of blueberries suitable for the fresh market has an average of four pickings over the season (between fresh and machine harvest pickings).

Hand-laborers usually pick into 6-pound buckets. Blueberries are weighed in the field, put into stackable plastic lugs, and loaded directly onto a refrigerated truck so they can begin to cool. Piece rates are used for paying these laborers, except in exceptional circumstances where picking is slow due to a light load or quality issues. In these cases, hand laborers will be paid hourly, versus on their individual picking yields.

Total costs of hand harvesting were found to be \$0.82 per pound. This includes labor, trucking to the packer, housing, and harvest supervision costs. We also included an additional cost of \$0.075 per pound, due to many growers having their fields custom harvested.

	Table 7.	Blueberry	harvest	and	packing	costs	in	Michigan.
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HARVEST COSTS	Rate/ Pound	Percent of crop	Based on Total finished crop yield/ acre	Harvest to packing loss rate	Applicable Harvested Pounds	Subtotal	TOTALS / acre
Hand Harvest Fresh		40%	5,500				\$4,087
-Including labor, trucking to packer, supervision, & any housing costs ¹	\$0.82			15%	2,588	\$2,122.35	
-Hand harvest upcharge	\$0.075			15%	2,588	\$194.12	
Packing costs for hand fresh ha	rvest						
-Fresh pack labor and overhead costs ¹	\$0.31			-	2,200	\$682.00	
-Fresh pack packaging costs	\$0.24			-	2,200	\$528.00	
-Fresh pack marketing costs	\$0.18			-	2,200	\$396.00	
-Fresh pack packing upcharge \$0.0				-	2,200	\$165.00	
Machine Harvest Fresh		20%	5,500				\$1,252
-Including machine cost, labor, field transport (see related tables for details)	\$0.193			30%	1,571	\$303.40	
-Machine harvest upcharge	\$0.04			30%	1,571	\$62.86	
Packing costs for machine Fresh	n harvest						
-Fresh pack labor and overhead costs ¹	\$0.31			-	1,100	\$341.00	
-Fresh pack packaging costs	\$0.24			-	1,100	\$264.00	
-Fresh pack marketing costs	\$0.18			-	1,100	\$198.00	
-Fresh pack packing upcharge	\$0.075			-	1,100	\$82.50	
Machine Harvest Frozen / Processed		40%	5,500				\$444
-Including machine cost, labor, field transport (see related tables for details)	\$0.162			n/a3	2,200	\$356.45	
-Machine harvest upcharge	\$0.04			n/a3	2,200	\$88.00	
				T	OTAL HARVE	ST COSTS	\$5,784

¹ Pruning, picking, and packing labor are based on interview and focus group estimates, inclusive of domestic and/or H2A labor costs.

² Foliar materials are applied with crop protectants, so it is assumed there are no substantial additional application costs.

³ While machine harvest has about 95% packout rate, the costs and revenues are assumed to be based on dock weight versus packed weight.

Mechanical Harvest. Mechanical harvest costs vary between the product destined for the fresh and processed fruit markets. Machines purchased today can be used for both, as they are built slightly differently from older models. Fresh-oriented machine harvest requires going a bit slower across the field than process-oriented fruit (Table 8). Otherwise, the mechanical harvest process is largely the same. One person drives the harvester, another operates a forklift, and laborers move the harvested product from the machine to the forklift. Due to larger volume, more laborers may be needed to keep up with processing-oriented harvesting.

MACHINE	Time	Labor Rate	Equipmo	ent Rate	Subtotal	TOTALS	Yield	TOTALS
HARVESTING COSTS	Hours/ Acre	\$/Hour	\$/Hour variable (cash)	\$/Hour fixed (Deprec.)	\$/Acre	\$/Acre	Finished pounds per pass *	\$/ pound
Machine Harvest Frozen / Processed						\$222.78	1,375	\$0.162
-Manual labor - 3.5 people x .8 hours	2.8	\$26.00			\$72.80			
-Skilled labor - 2 people x .8 hours	1.6	\$33.00			\$52.80			
-Blueberry Machine Harvester	0.8		\$23.62	\$79.64	\$82.60			
-60 HP tractor w forklift	0.8		\$9.45	\$8.77	\$14.58			
Machine Harvest Fresh						\$265.47	1,375	\$0.193
-Manual labor - 3 people x 1.0 hours	3.0	\$26.00			\$78.00			
-Skilled labor - 2 people x 1.0 hours	2.0	\$33.00			\$66.00			
-Blueberry Machine Harvester	1.0		\$23.62	\$79.64	\$103.25			
-60 HP tractor with forklift	1.0		\$9.45	\$8.77	\$18.22			

Table 8. Cost breakdown for machine harvesting (fresh and processed) Michigan blueberries.

* Assumes 1/4 of the yield per picking.

Fresh Packing costs. Fresh packing costs make up a substantial proportion of the costs of production for Michigan blueberries. Because growers are paid based on the pounds that are packed, these costs are an integral part of the blueberry budget. Packing costs are relatively similar across packers. What does vary is the amount of product that is picked for fresh relative to the amount harvested for processing. Some farms' portfolios lean toward processororiented cultivation, but most are leaning more and more toward fresh production in response to the higher demand and marketing potential for fresh blueberries.

Labor and overhead costs, which include building and equipment costs in addition to any relevant housing costs, were \$0.31 per pound (see Table 7, above). Packaging costs (clamshells, box, etc.) came to \$0.24 per pound. Marketing costs vary between packers and marketers. They also fluctuate based on the market throughout the season, because they are incurred as a percentage of the sales price. The average we found across packers was \$0.18 per pound for 2024. Similar to picking, an upcharge cost was included for packing, due to many growers' product being packed by other growers.

REVENUES

We developed a revenue and cost calculator to determine profits based on price. Table 9 below shows those calculations based on the average split we found for the industry: 40% hand fresh, 20% machine fresh, and 40% machine harvest for process/frozen. For price, we used the "dock" price we found for processed product of \$0.46, and the \$2.74 price we found for finished fresh-packed product. The latter includes marketing fees; without the fees, the price would be \$2.56.

			REVENUES				COST	S		
Percenta	ges	Pounds by type at stated yield of	5,500	Revenue per pound	Total Revenues	Operating	Harvest & Fresh Pack	Other	Total Costs	PROFITS
Hand Fresh	40%	Fresh Packed Pounds:	2,200	\$2.74	\$6,0 28	\$1,204	\$4,087	\$640	\$5,932	\$96
		Pounds diverted to processed ¹ :	369	\$0.46	\$170				\$170	
Machine Fresh	20%	Fresh Packed Pounds:	1,100	\$2.74	\$3,014	\$602	\$1,252	\$323	\$2,177	\$837
		Pounds diverted to processed ² :	424	\$0.46	\$195			\$195		
Machine Processed	40%	Processed Pounds:	2,200	\$0.46	\$1,012	\$1,204	\$444	\$636	\$2,284	-\$1,272
¹ Formula for harvested po	¹ Formula for the diverted hand-picked product making 'ABC Juice' grade is harvested pounds minus packed pounds x 95%.									

Table 9. Per acre revenues and costs for average Michigan blueberry production.

harvested pounds minus packed pounds × 95%. ² Formula for the diverted **machine-harvested** product making 'ABC Juice' grade

is harvested pounds minus packed pounds $\times 90\%$.

Using the yield assumption of 5,500 pounds per acre, revenues for the average Michigan blueberry field are close to breakeven with costs. Note that costs in these revenue tables are based on the applicable harvested pounds needed to achieve the requisite stated finished pounds (see column six of Table 7, "Applicable harvested pounds").

While average fields indicate that production is only at a breakeven point in relation to costs, these costs do include a \$240 per acre allocation for management by the farm owner or paid manager, as well as establishment and land control costs. Individual growers may have cost savings that add to their income relative to this budget's numbers (see section "Application to the Individual Farm" below). However, we can see from these numbers why vertical integration and growing economies of scale have been increasing in the blueberry industry during the last decade, similar to other Michigan specialty crops.

Looking at Figure 3, we can see that positive cash flow occurs at about Year 7. From that point forward, revenues exceed costs by about \$943 per acre per year (see Table 14 in the Appendix for more details). While the situation might have been substantially different when many of Michigan's blueberry fields were first planted, the current costs of establishment would take about 37 years to fully pay off at average yields and 2024 prices. This makes higher-yielding production practices and new cultivars from breeding programs of great interest to growers.



Blueberry field nearly ready for harvest.

MICHIGAN STATE UNIVERSITY EXTENSION Copyright 2025 Michigan State University Board of Trustees. **Figure 3.** Annual net cash flow for average Michigan blueberry acreage based on 2024 osts and prices.



HIGH-INPUT FRESH-ORIENTED STRATEGY

To increase profitability, many growers are moving toward a higher-input, fresh-oriented strategy. This entails higher pruning, fertilizer, and bush establishment costs, among others. Growers adopting this approach are often investing in higher-cost genetics - improved varieties that can increase fruit quality, yield, and storability. Machine harvest can also be a part of the picture-many of these new varieties do better under mechanical harvest conditions than older genetics, thereby reducing labor costs. Higher-input growers are also often vertically integrated so they can do their own packing. While hand picking is still the predominant harvest method, vertical integration allows them to be more nimble and targeted with machine harvest. It also enables them to glean value from discarded fruit (sort-outs). These growers harvest much less of their product directly for processing markets. However, due to weather and ripening concerns, some percentage of the product will go directly to processors in most years.

For calculating the costs and benefits of this strategy, we assumed these growers have a 60% hand-picked fresh, 30% machine-picked fresh, and 10% machine-harvested processing split for their blueberries. Other assumptions are:

- Plantings: 25 bearing years and 28 total years of life, varieties are more likely to be changed out due to upgraded genetics or new varieties;
- Bush cost: \$7.50;
- Mulching: 120 yards (double the average budget);
- Fertilizer costs: doubled in early years, and double the liquid and foliar fertilizer costs in production years relative to the average budget;
- Bee hives: Five per acre for pollination; and
- Yield: 7,500 pounds per acre.

We detail the cost picture of this strategy in Tables 15a through 15c in the Appendix. The resulting revenues are illustrated in Table 10, below. Note that for this strategy, at 2024 prices, the annual production year profits calculate to \$2,952 per acre. However, consider that price fluctuations make a big difference in outcomes. Also, the full costs of vertical integration might not be well captured in this estimate. Further, higher levels of management are needed for this approach and may not be properly accounted for. We can pay closer attention to these nuances during the next Michigan blueberry cost of production update.



Blueberries in plastic tubs waiting to get packaged.

		REVEN	UES		COSTS					
Percentages		Lbs. by type at stated yield of	7,500	Revenue per lb.	Total Revenues	Operating	Harvest & Fresh Pack	Other	Total Costs	PROFITS
Hand Fresh	60%	Fresh Packed Pounds:	4,500	\$2.74	\$12,330	\$2,015	\$8,361	\$1,320	\$11,695	\$635
	Pounds diverted to processed ¹ :	754	\$0.46	\$347			\$347			
Machine Fresh	30%	Fresh Packed Pounds:	2,250	\$2.74	\$6,165	\$1,007	\$2,560	\$666	\$4,234	\$1,931
		Pounds diverted to processed ² :	868	\$0.46	\$399					\$399
Machine Processed	10%	Processed Pounds:	750	\$0.46	\$345	\$336	\$152	\$218	\$706	-\$361
						GRAND TOT	AL ANNUAL	PROFITS	per acre	\$2.952

Table 10. Per acre revenues and costs for a high-input, fresh-oriented production strategy.

¹ Formula for the diverted hand-picked product making 'ABC Juice' grade is harvested pounds minus packed pounds x 95%. ² Formula for the diverted machine-harvested product making 'ABC Juice' grade is harvested pounds minus packed pounds x 90%.

Finally, Figure 4 below illustrates the cash flow projection over the life of the planting using this strategy. Despite higher costs, the first year of positive cash flow comes earlier (Year 6) than with the average approach (Year 7). The breakeven year — the year that establishment costs become fully paid for — is Year 14 with the high-input approach, despite being allocated over fewer bearing years.

Figure 4. Annual net cash flow for growers engaged in high-input strategies, based on 2024 prices. Even with more expensive costs, net cash flow is much stronger than that of the average approach (compare with Figure 3 above).



APPLICATION TO THE INDIVIDUAL FARM

This study looked at averages across the blueberry industry and broadly across Michigan's production regions. Individual farms may have higher or lower costs based on each farm's unique circumstances. Of course, yield and price are both critical drivers of the overall cost and revenue picture for this crop.

When applying these results to an individual farm, make sure to adjust costs based on the farm's yield by dividing the total cost of full-bearing acreage by the farm's average yield. Also, adjust by considering the farm's typical split between hand-picked berries for fresh market, machine-picked for fresh market, and the machine-picked processed product. For this, refer to Table 16 in the Appendix for profits based on different splits and yields. Of course, price is also a strong factor in profit assessment. See Table 17 in the Appendix for breakdowns of profits based on different prices, yield, and split assumptions.

On the cost side, growers who have their farmland paid off can subtract out the \$375 land control costs. Those who are not planning to replant can subtract the establishment allocation from their cost picture as well. If operating loan lines are not needed for cash flow purposes, the operating interest allocation can also be subtracted.

If a grower needs to use loans to help finance the establishment of fields, the interest cost of that longer-term loan would need to be added into this budget. This could apply to blueberry growers who are increasing their acreage, in addition to beginning farmers. Higher input strategies, as outlined above, also require taking higher costs into account.

SUMMARY/ CONCLUSIONS

Input costs have been increasing, including fertilizer, spray program, packaging, mulch, and labor costs. However, due to the growing concentration of retailers and an increasingly globalized market, there is less control over the end pricing for blueberries. As such, margins have tightened, similar to other specialty crops in Michigan. Based on 2024 prices, nonvertically integrated growers with average yields and costs are operating at about break-even, from an economic perspective. This estimate does include growers receiving about \$240 an acre for their management time. Cost-cutting strategies or low land costs may be sources of profit for farmers, and direct marketing can also generate higher revenues. Vertical integration and expanding a farm's economies of scale are also methods for cost savings and for gathering more revenue from each harvested pound of blueberries.

Many growers are responding to the current challenging margins by using high-input, freshoriented strategies for growing blueberries. These approaches produce higher percentages of fresh-packed product and higher overall yields. Some level of machine harvest for fresh is often part of this strategy, and machine harvest for fresh blueberries has increased in Michigan over the last decade. Vertical integration of packing activities may be important for the profitability of machinefresh harvest.

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Ripe blueberries between the leaves.

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Blueberry field in early spring after pruning

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APPENDIX

Table 11. Equipment costs for Michigan blueberry production.

EQUIPMENT					SET Interest ra	ate:	4%								
Item	Cost	Salvage Value %	Rate Trade-in Value	Years Life	Annual Depreciation	Annual Depreciation plus Interest	Fuel /hour	Gal. \$4.00 /gal.	Lubrication (10% of fuel)	Maint. Repair & Cost 1%	TOTAL Annual Cost	Total Use Hours per Year	Variable Cost /Hour	Fixed Cost /Hour	Total Cost per Hour
85 HP 4WD Spray with cab	\$85,000	15%	\$12,750	10	\$7,225	\$8,908	2.88	\$5,760	\$576	\$850	\$16,094	500	\$14.37	\$17.82	\$32.19
60 HP 2WD General/forklift	\$60,000	15%	\$9,000	12.5	\$4,080	\$5,264	1.92	\$4,608	\$461	\$600	\$10,933	600	\$9.45	\$8.77	\$18.22
Airblast	\$47,000	15%	\$7,050	12.5	\$3,196	\$4,124	1.44	\$2,304	\$230	\$470	\$7,128	400	\$7.51	\$10.31	\$17.82
Weed Sprayer	\$15,000	15%	\$2,250	15	\$850	\$1,147				\$150	\$1,297	240	\$0.63	\$4.78	\$5.40
	1	1	1		1	1			1						
Fertilizer Spreader	\$25,000	15%	\$3,750	15	\$1,417	\$1,911				\$250	\$2,161	150	\$1.67	\$12.74	\$14.41
	1	í	1		1	1			1	1		1			
Rotary Mower	\$8,000	15%	\$1,200	10	\$680	\$838				\$80	\$918	300	\$0.27	\$2.79	\$3.06
	1	T	1		1	1			1			1			
Flail Chopper	\$10,000	15%	\$1,500	10	\$850	\$1,048				\$100	\$1,148	240	\$0.42	\$4.37	\$4.78
	1	1	1		1	1	1					1			
Water Tank	\$5,000	48%	\$2,400	5	\$520	\$584	1.60	\$1,280	\$128	\$50	\$2,042	200	\$7.29	\$2.92	\$10.21
			1	1	I		1		(1			
Flatbed Truck	\$45,000	25%	\$11,250	12.5	\$2,700	\$3,484	1.60	\$2,560	\$256	\$450	\$6,750	400	\$8.17	\$8.71	\$16.87
	1		1	1	1	1	1					r			
Machine Harvester	\$250,000	15%	\$37,500	15	\$14,167	\$19,112	3.00	\$2,880	\$288	\$2,500	\$24,780	240	\$23.62	\$79.64	\$103.25
	I	Т	1	1	1	1	1			1		1			
Mulch Spreader	\$28,000	15%	\$4,200	12.5	\$1,904	\$2,457				\$280	\$2,737	30	\$9.33	\$81.89	\$91.22

ESTABLISHMENT COSTS	Time	Labor Rate	Materials	Equipm	nent Rate	Subtotal	TOTAL
	Hours/ Acre	\$/Hour	or Custom Cost \$/ Acre	\$/Hour Variable (cash)	\$/Hour, Fixed (non- cash)	\$/Acre	\$/Acre
Pre-plant							
Land Clearing			\$1,000.00			\$1,000.00	
Roots and Rocks	8.0	\$26.00				\$208.00	
85 HP tractor (with trailer)	0.8	\$33.00		\$14.37	\$17.82	\$52.15	
Soil samples			\$10.00			\$10.00	
Disking - \$16 per acre, twice			\$32.00			\$32.00	
Mulching \$6/yard x 60 yards	2.0	\$33.00	\$360.00			\$426.00	
60HP tractor	2.0			\$9.45	\$8.77	\$36.44	
Mulch spreader	2.0			\$9.33	\$81.89	\$182.44	
Irrigation Solid set			\$1,500.00			\$1,500.00	
Allocation for pump			\$1,000.00			\$1,000.00	
Drip setup			\$3,000.00			\$3,000.00	
Tiling			\$1,000.00			\$1,000.00	
					Total Pre-p	plant costs	\$8,447
Planting							
Bush costs							
\$5 bush x 1452 per acre			\$7,260.00			\$7,260.00	
Planting	26.0	\$26.00				\$676.00	
60 HP tractor to carry plants	2.0	\$33.00		\$9.45	\$8.77	\$102.44	
Seeding grass middles	0.3	\$33.00	\$60.00			\$69.90	
60 HP tractor	0.3			\$9.45	\$8.77	\$5.47	
Spreader	0.3			\$1.67	\$12.74	\$4.32	
Fertilizer (dry only)	0.4	\$33.00	\$100.00			\$113.20	
60 HP tractor	0.4			\$9.45	\$8.77	\$7.29	
Spreader-Pull Type	0.4			\$1.67	\$12.74	\$5.76	
Land control costs			\$375.00			\$375.00	
Real estate tax			\$100.00			\$100.00	
Management	6.0	\$40.00				\$240.00	
Operating interest							
8% APR on costs for 6 months			\$696.26			\$696.26	
					Total Plan	ting costs	\$9,656

 Table 12. Establishment costs for Michigan blueberries.

Table 12. Establishment costs f	for Michigan blueberries ((continued).
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ESTABLISHMENT COSTS	Time	Labor Rate	Materials	Equipn	nent Rate	Subtotal	TOTAL		
	Hours/ Acre	\$/Hour	or Custom Cost \$/ Acre	\$/Hour Variable (cash)	\$/Hour, Fixed (non- cash)	\$/Acre	\$/Acre		
Growing Years 1 - 3									
Soil Aeration	0.2	\$33.00				\$6.60			
60 HP tractor	0.2			\$9.45	\$8.77	\$3.64			
Irrigation Operation			\$167.00			\$167.00			
Pruning, training & deflowering	6.0	\$26.00				\$156.00			
Brush Chopping	0.5	\$33.00				\$16.50			
85 HP tractor	0.5			\$14.37	\$17.82	\$16.09			
Flail mower	0.5			\$0.42	\$4.37	\$2.39			
Hand weeding	5.0	\$26.00				\$130.00			
Fertilizer (includes dry + liquid)	0.4	\$33.00	\$200.00			\$213.20			
60 HP tractor	0.4			\$9.45	\$8.77	\$7.29			
Spreader	0.4			\$1.67	\$12.74	\$5.76			
Mowing									
3 trips/year at .25 hours/trip	0.75	\$33.00				\$24.75			
60 HP tractor	0.75			\$9.45	\$8.77	\$13.67			
Rotary Mower	0.75			\$0.27	\$2.79	\$2.30			
Crop Protection									
Materials, 46% of full program			\$151.06			\$151.06			
Total for 7 trips/year	1.0	\$33.00				\$33.00			
85 HP tractor	1.0			\$14.37	\$17.82	\$32.19			
Airblast Sprayer	1.0			\$7.51	\$10.31	\$17.82			
Herbicide									
3 trips/year at .3 hours/trip	0.9	\$33.00	\$123.30			\$153.00			
60 HP tractor	0.9			\$9.45	\$8.77	\$16.40			
Weed sprayer	0.9			\$0.63	\$4.78	\$4.86			
Porta-potties			\$12.00			\$12.00			
Land control costs			\$375.00			\$375.00			
Real estate tax			\$100.00			\$100.00			
Management	6.0	\$40.00				\$240.00			
Operating interest									
8% APR on costs avg 4 months			\$50.68			\$50.68			
*Years 4-7 have average 55% products	uction; ther	efore 45% x ba	ase early year c	:ost/year is	Total Year 1 C	osts	\$1,951		
aunduled to estadishment.	ted to establshment.				Total Year 2 0	Costs	\$1,951		
			Total Year 3 Costs			Costs	\$1,951		
			Growing years 4-7 partial all			allocation*	\$3,548		
				TOTAL EST	\$27,504				
		Allocation per year, 30 production years							

Table 13. Sample spray program.

	Sample Spray Pr	ogram		
App #	Purpose	Material	Rate	Unit
1 Green tip	Phomosis & mummy	Indar 75WSP	2	oz
2 1/2" green	Phomosis & mummy	Quash	2.5	oz
3 Pink	Phomosis & mummy	Luna	21	oz
4 Bloom	Fruit worms	Intrepid 2F	16	oz
5 Petal fall	Fruit worms & thrips	lmidan 50WP	21	oz
6 Green berry	Anthracnose	Abound	15	oz
7 Green berry	Alternaria	Switch	14	oz
8 Coloring stage	Anthracnose	Abound	15	oz
	Blueberry maggot, SWD	Imidan	21	oz
9 Coloring state	Alternaria	Switch	14	oz
	Blueberry maggot, SWD	Lannate 2.4	48	oz
10 Pre-harvest	Alternaria, anthracnose	Switch	14	oz
	SWD, blueberry maggot	Mustang Maxx	4	oz
11 Post 1st harvest	Alternaria, anthracnose	Switch	14	oz
	SWD	Imidan	21	oz
12 Post 2nd harvest	Alternaria, anthracnose	Brigade	6.4	oz
	Anthracnose	Abound	15	oz
13 Post 3rd harvest	SWD	Lannate 2.4	48	oz
	Anthracnose	Switch	14	oz
14 Post 4th harvest	SWD	Mustang Maxx	4	oz
	Anthracnose	Abound	15	oz

Table 14. Net cash flow, 33-year life, average costs and yields for Michigan 2024.

Year			0		1		2		3		4	5		6	7		8	9
Costs		\$18	3,103	\$	1,951	\$	51,951		\$1,951	\$ 5	5,103	\$6,19	5	\$7,289	\$8,383	3	\$9,476	\$9,476
Revenue		\$	50		\$O		\$0		\$ 0	\$2	2,841	\$4,73	6	\$6,630	\$8,524	1	\$10,419	\$10,419
Cash flow		-\$18	3,103	-\$	1,951	-9	\$1,951	-	\$1,951	-\$2	2,262	-\$1,45	9	-\$659	\$141		\$943	\$943
Sum of NC	Fs	-\$18	3,103	-\$2	0,054	-\$2	22,005	-\$	23,956	-\$2	26,218	-\$27,67	77	-\$28,336	-\$28,19	5	-\$27,252	-\$26,309
10	11		12		13		14		15		16	1	17	18	19		20	21
\$9,476	\$9,47	76	\$9,4 ⁻	76	\$9,47	'6	\$9,476	6	\$9,476	5	\$9,476	\$9,	476	\$9,476	\$9,4	76	\$9,476	\$9,476
\$10,419	\$10,4	19	\$10,4	119	\$10,4	19	\$10,419	9	\$10,419)	\$10,419	\$1C),419	\$10,419	\$10,4	19	\$10,419	\$10,419
\$943	\$943	3	\$94	3	\$943	3	\$943		\$943		\$943	\$9	943	\$943	\$94	3	\$943	\$943
-\$25,366	-\$24,4	23	-\$23,4	180	-\$22,5	37	-\$21,59	4	-\$20,65	51	-\$19,708	-\$18	8,765	-\$17,822	-\$16,8	379	-\$15,936	-\$14,993
22	23		24		25		26		27		28	2	29	30	31		32	33
\$9,476	\$9,47	76	\$9,4	76	\$9,47	76	\$9,476	6	\$9,476	5	\$9,476	\$9,	476	\$9,476	\$9,4	76	\$9,476	\$9,476
\$10,419	\$10,4	19	\$10,4	119	\$10,4	19	\$10,41	9	\$10,419	9	\$10,419	\$1C),419	\$10,419	\$10,4	19	\$10,419	\$10,419
\$943	\$94	3	\$94	3	\$943	3	\$943	3	\$943		\$943	\$9	943	\$943	\$94	3	\$943	\$943
-\$14,050	-\$13,10	07	-\$12,1	64	-\$11,2	21	-\$10,27	78	-\$9,335	5	-\$8,392	-\$7,	,449	-\$6,506	-\$5,5	63	-\$4,620	-\$3,677

Net Cash Flow at current price and average yields

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Table 15a. Establishment costs for high-input, fresh-oriented production strategy, 2024.

ESTABLISHMENT COSTS	Time	Labor Rate	Materials	Equipr	nent Rate	Subtotal	TOTAL
	Hours/ Acre	\$/Hour	or Custom Cost \$/Acre	\$/Hour Variable (cash)	\$/Hour, fixed (non- cash)	\$/Acre	\$/Acre
Pre-plant							
Land Clearing			\$1,000.0 0			\$1,000.00	
Roots and Rocks	8.0	\$26.00				\$208.00	
85 HP tractor (with trailer)	0.8	\$33.00		\$14.37	\$17.82	\$52.15	
Soil samples			\$10.00			\$10.00	
Disking - \$16 per acre, twice			\$32.00			\$32.00	
Mulching \$6/yard x 120 yards	4.0	\$33.00	\$720.00			\$852.00	
60HP tractor	4.0			\$9.45	\$8.77	\$72.89	
Mulch spreader	4.0			\$9.33	\$81.89	\$364.88	
Irrigation Solid set			\$1,500.00			\$1,500.00	
Allocation for pump			\$1,000.00			\$1,000.00	
Drip setup			\$3,000.00			\$3,000.00	
Tiling			\$1,000.00			\$1,000.00	
					Total Pre-	plant costs	\$9,092
Planting							
Bush costs							
\$5 bush x 1450 per acre			\$10,890.00			\$10,890.00	
Planting	26.0	\$26.00				\$676.00	
60 HP tractor to carry plants	2.0	\$33.00		\$9.45	\$8.77	\$102.44	
Seeding grass middles	0.3	\$33.00	\$60.00			\$69.90	
60 HP tractor	0.3			\$9.45	\$8.77	\$5.47	
Spreader	0.3			\$1.67	\$12.74	\$4.32	
Fertilizer (dry only)	0.4	\$33.00	\$200.00			\$213.20	
60 HP tractor	0.4			\$9.45	\$8.77	\$7.29	
Spreader-Pull Type	0.4			\$1.67	\$12.74	\$5.76	
Land control costs			\$375.00			\$375.00	
Real estate tax			\$100.00			\$100.00	
Management	6.0	\$40.00				\$240.00	
Operating interest							
8% APR on costs for 6 months			\$871.25			\$871.25	
					Total Plar	nting costs	\$13,561
Growing Years 1 - 3							
Soil Aeration	0.2	\$33.00				\$6.60	
60 HP tractor	0.2			\$9.45	\$8.77	\$3.64	
Irrigation Operation			\$167.00			\$167.00	
Pruning, training & deflowering	6.0	\$26.00				\$156.00	

 Table 15a.
 Establishment costs for high-input, fresh-oriented production strategy, 2024 (continued).

ESTABLISHMENT COSTS	Time	Labor Rate	Materials	Equipr	nent Rate	Subtotal	TOTAL
	Hours/ Acre	\$/Hour	or Custom Cost \$/Acre	\$/Hour Variable (cash)	\$/Hour, fixed (non- cash)	\$/Acre	\$/Acre
Brush Chopping	0.5	\$33.00				\$16.50	
85 HP tractor	0.5			\$14.37	\$17.82	\$16.09	
Flail mower	0.5			\$0.42	\$4.37	\$2.39	
Hand weeding	5.0	\$26.00				\$130.00	
Fertilizer (includes dry + liquid)	0.4	\$33.00	\$400.00			\$413.20	
60 HP tractor	0.4			\$9.45	\$8.77	\$7.29	
Spreader	0.4			\$1.67	\$12.74	\$5.76	
Mowing							
3 trips/year at .25 hours/trip	0.75	\$33.00				\$24.75	
60 HP tractor	0.75			\$9.45	\$8.77	\$13.67	
Rotary Mower	0.75			\$0.27	\$2.79	\$2.30	
Crop Protection							
Total for 13 trips/year	1.0	\$33.00	\$151.06			\$184.06	
85 HP tractor	1.0			\$14.37	\$17.82	\$32.19	
Airblast Sprayer	1.0			\$7.51	\$10.31	\$17.82	
Herbicide							
3 trips/year at .3 hours/trip	0.9	\$33.00	\$123.30			\$153.00	
60 HP tractor	0.9			\$9.45	\$8.77	\$16.40	
Weed sprayer	0.9			\$0.63	\$4.78	\$4.86	
Porta-potties			\$12.00			\$12.00	
Land control costs			\$375.00			\$375.00	
Real estate tax			\$100.00			\$100.00	
Management	6.0	\$40.00				\$240.00	
Operating interest							
8% APR on costs avg 4 months			\$56.01			\$56.01	
*Years 4-7 have average 50% production is attributed to establishment.	ction; there	efore 50% x	base early yea	r cost/year	Total Ye	ar 1 Costs	\$2,157
				Total Year 2 Costs		ar 2 Costs	\$2,157
				Total Year 3 Costs			\$2,157
				Growing y	\$4,313		
	TOTAL ESTABLISHMENT COSTS				\$33,435		
			Allocation p	er year, 25	production ye	ars	\$1,337

Table 15b. Growing/production costs for high-input, fresh-oriented production strategy, 2024.

Operating and har	vest costs, a	and cost tota	als for Bluebe	rry producti	on in 2024		
В	ased on ave	rage over 25	-year bearing li	fetime			
	Time	Labor Rate	Materials	Equipm	nent Rate	Subtotal	TOTALS
OPERATING COSTS	Hours/ Acre	\$/Hour	or Custom Cost \$/ Acre	\$/Hour variable (cash)	\$/Hour fixed (Deprec.)	\$/Acre	\$/Acre
Pruning and brush disposal				0			\$837
-Pruning labor (\$0.54 x 1450 plants) ¹			\$784.08			\$784.08	
-85 HP Tractor for Brush Disposal	0.75	\$33.00		\$14.37	\$17.82	\$48.89	
-Flail Chopper	0.75			\$0.42	\$4.37	\$3.59	
Soil aeration						•	\$10
-60 HP tractor	0.2	\$33.00		\$9.45	\$8.77	\$10.24	
Mowing Total for 3 trips per year						•	\$41
-60 HP tractor	0.75	\$33.00		\$9.45	\$8.77	\$38.42	
-Rotary mower	0.75			\$0.27	\$2.79	\$2.30	
Irrigation							\$270
-Irrigation operation costs/ year			\$250.00			\$250.00	
-Frost protection costs/year			\$20.00			\$20.00	
Crop protection Total for 13 trips per year				0			\$478
-85 HP tractor	1.8	\$33.00		\$14.37	\$17.82	\$117.34	
-Orchard Sprayer	1.8			\$7.51	\$10.31	\$32.08	
-Total material costs			\$328.40			\$328.40	
Herbicide Total for 3 trips per year			1		1	1	\$174
-60 HP tractor	0.9	\$33.00		\$9.45	\$8.77	\$46.10	
-Weed sprayer	0.9			\$0.63	\$4.78	\$4.86	
-Total material costs			\$123.30			\$123.30	
Fertilizer		1	T	T	1		\$708
-60 HP Tractor for dry app 2x / year	0.4	\$33.00		\$9.45	\$8.77	\$20.49	
-Spreader	0.4			\$1.67	\$12.74	\$5.76	
-Dry application material costs			\$190.00			\$190.00	
-Liquid/fertigation material costs2			\$300.00			\$300.00	
-Foliar materials			\$192.00			\$192.00	
Other Operating		1	1	1	1	1	\$840
Bees 5.0 hives per acre @ \$68/hive			\$340.00			\$340.00	
Soil testing once every 3 years @ \$10/acre	<u>)</u>		\$3.33			\$3.33	
Crop insurance			\$85.00			\$85.00	
Food safety compliance			\$60.00			\$60.00	
Porta-potties			\$12.00			\$12.00	
Management and labor supervision	6.0	\$40.00				\$240.00	
Property taxes per acre			\$100.00			\$100.00	
				то	TAL OPERAT	ING COSTS	\$3,358

1 Pruning, picking, and packing labor are based on interview and focus group estimates, inclusive of domestic and/or H2A labor costs. 2 Foliar materials are applied with crop protectants, so it is assumed there are no substantial additional application costs.

Table 15c. Harvest costs and cost totals for high-input, fresh-oriented production strategy, 2024.

HARVEST COSTS	Rate/ Pound	Percent of crop	Based on Total finished crop yield/acre	Harvest to packing loss rate	Applicable Harvested Pounds	Subtotal	TOTALS / acre		
Hand Harvest Fresh		60%	7,500				\$8,361		
-Including labor, trucking to packer, supervision, & any housing costs1	\$0.82			15%	5,294	\$4,341.18			
-Hand harvest upcharge	\$0.075			15%	5,294	\$397.06			
Packing costs for hand fresh harve	est	1	1	1		1			
-Fresh pack labor and overhead costs1	\$0.31			-	4,500	\$1,395.00			
-Fresh pack packaging costs	\$0.24			-	4,500	\$1,080.00			
-Fresh pack marketing costs	\$0.18			-	4,500	\$810.00			
-Fresh pack packing upcharge	\$0.075			-	4,500	\$337.50			
Machine Harvest Fresh		30%	7,500				\$2,560		
-Including machine cost, labor, field transport (see related tables for details)	\$0.193			30%	3,214	\$620.59			
-Machine harvest upcharge	\$0.04			30%	3,214	\$128.57			
Packing costs for Machine Fresh H	larvest								
-Fresh pack labor and overhead costs1	\$0.31			-	2,250	\$697.50			
-Fresh pack packaging costs	\$0.24			-	2,250	\$540.00			
-Fresh pack marketing costs	\$0.18			-	2,250	\$405.00			
-Fresh pack packing upcharge	\$0.075			-	2,250	\$168.75			
Machine Harvest Frozen / Processed		10%	7,500				\$152		
-Including machine cost, labor, field transport (see related tables for details)	\$0.162			n/a3	750	\$121.52			
-Machine harvest upcharge	\$0.04			n/a3	750	\$30.00			
				Т	OTAL HARV	EST COSTS	\$11,073		
Operating Interest on VARIABLE	E operating	and harve	est costs, 8% APF	? for average 4	months	\$382			
Establishment Cost Per year, spr	ead over 2	5 bearing	years			\$1,337			
Land Control Cost						\$375			
TOTAL Establishment, Land, and Interest Costs									
				GRAND	TOTAL COS	TS per Acre	\$16,525		
Total Operating & Harvest Cost p	er pound					\$1.92			
Total Establishment, Land and Inte	erest Cost	per pound				\$0.28			
Total Blueberry Assessments per pound (USHBC \$0.009 + MBC \$0.003) \$0.012									
Co	ost per Pou	ind tor Hig	n Input, Michigan	in 2024, GRA	ND TOTAL:	\$2.22	per pound		

¹ Pruning, picking, and packing labor are based on interview and focus group estimates, inclusive of domestic and/or H2A labor costs.

² Foliar materials are applied with crop protectants, so it is assumed there are no substantial additional application costs.

³ While machine harvest has about 95% packout rate, the costs and revenues are assumed to be based on dock weight versus packed weight.

PROFITS at DIFFERENT YIELDS	and SPLITS, wit	th Fresh price of	\$2.74, Pro	cessed price of	\$0.46	
Hand Fresh / Machine Fresh / Machine Processed Split	3,500 lb Yield	4,500 lb Yield	5,500 lb Yield	6,500 lb Yield	7,500 lb yield	8,500 lb Yield
100% / 0% / 0%	(\$1,226)	(\$280)	\$665	\$1,610	\$2,555	\$3,500
80% / 20% / 0%	(\$653)	\$455	\$1,564	\$2,673	\$3,782	\$4,890
80% / 10% / 10%	(\$1,184)	(\$227)	\$730	\$1,687	\$2,644	\$3,601
75% / 25% / 0%	(\$510)	\$639	\$1,789	\$2,939	\$4,088	\$5,238
70% / 20% / 10%	(\$898)	\$141	\$1,180	\$2,218	\$3,257	\$4,296
60% / 40% / 0%	(\$81)	\$1,191	\$2,464	\$3,736	\$5,008	\$6,280
60% / 30% / 10%	(\$612)	\$509	\$1,629	\$2,750	\$3,870	\$4,991
60% / 20% / 20%	(\$1,143)	(\$174)	\$795	\$1,764	\$2,733	\$3,702
60% / 0% / 40%	(\$2,204)	(\$1,539)	(\$873)	(\$208)	\$458	\$1,123
50% / 50% / 0%	\$205	\$1,559	\$2,913	\$4,267	\$5,621	\$6,975
50% / 25% / 25%	(\$1,122)	(\$147)	\$828	\$1,802	\$2,777	\$3,752
40% / 40% / 20%	(\$570)	\$562	\$1,695	\$2,827	\$3,959	\$5,092
40% / 30% / 30%	(\$1,101)	(\$120)	\$860	\$1,841	\$2,822	\$3,802
20% / 50% / 30%	(\$529)	\$615	\$1,760	\$2,904	\$4,048	\$5,192
0% / 100% / 0%	\$1,636	\$3,399	\$5,162	\$6,925	\$8,688	\$10,450
0% / 75% / 25%	\$309	\$1,693	\$3,076	\$4,460	\$5,844	\$7,227
0% / 60% / 40%	(\$487)	\$669	\$1,825	\$2,981	\$4,137	\$5,293
0% / 50% / 50%	(\$1,018)	(\$14)	\$991	\$1,995	\$2,999	\$4,004
0% / 25% / 75%	(\$2,345)	(\$1,720)	(\$1,095)	(\$470)	\$155	\$780
0% / 0% / 100%	(\$3,673)	(\$3,427)	(\$3,181)	(\$2,935)	(\$2,689)	(\$2,443)

 Table 16. Profits based on different splits and yields, using the Michigan 2024 average budget as a basis.



Blueberries ready for picking

Table 17. Profits at different prices, yields, and splits, using the Michigan 2024 average budget as a basis.

PROFITS at DIFFERENT PR	ICES, YIELDS, and	SPLITS	·				
Hand Fresh / Machine Fresh /Machine Processed Split	Fresh*/ process price	3,500 lb Yield	4,500 lb Yield	5,500 lb Yield	6,500 lb Yield	7,500 lb Yield	8,500 lb Yield
75% / 25% / 0%	\$.35 /\$2.45	(\$1,611)	(\$776)	\$60	\$895	\$1,730	\$2,565
	\$.40 /\$2.60	(\$1,047)	(\$51)	\$946	\$1,942	\$2,938	\$3,934
	\$.40 /\$2.80	(\$347)	\$849	\$2,046	\$3,242	\$4,438	\$5,634
	\$.50 /\$2.80	(\$269)	\$949	\$2,168	\$3,386	\$4,605	\$5,823
	\$.65/\$2.80	(\$152)	\$1,099	\$2,351	\$3,603	\$4,855	\$6,107
	\$.65/\$2.90	\$198	\$1,549	\$2,901	\$4,253	\$5,605	\$6,957
	\$.75/\$2.90	\$275	\$1,649	\$3,023	\$4,397	\$5,771	\$7,145
70% / 20%/ 10%	\$.35 /\$2.45	(\$1,925)	(\$1,179)	(\$434)	\$311	\$1,057	\$1,802
	\$.40 /\$2.60	(\$1,401)	(\$506)	\$389	\$1,285	\$2,180	\$3,075
	\$.40 /\$2.80	(\$771)	\$304	\$1,379	\$2,455	\$3,530	\$4,605
	\$.50 /\$2.80	(\$668)	\$437	\$1,541	\$2,646	\$3,751	\$4,855
	\$.65/\$2.80	(\$513)	\$636	\$1,784	\$2,933	\$4,082	\$5,231
	\$.65/\$2.90	(\$198)	\$1,041	\$2,279	\$3,518	\$4,757	\$5,996
	\$.75/\$2.90	(\$95)	\$1,173	\$2,441	\$3,710	\$4,978	\$6,246
60% / 30% / 10%	\$.35 /\$2.45	(\$1,647)	(\$822)	\$2	\$827	\$1,652	\$2,477
	\$.40 /\$2.60	(\$1,119)	(\$144)	\$832	\$1,808	\$2,783	\$3,759
	\$.40 /\$2.80	(\$489)	\$666	\$1,822	\$2,978	\$4,133	\$5,289
	\$.50 /\$2.80	(\$378)	\$809	\$1,996	\$3,183	\$4,370	\$5,558
	\$.65/\$2.80	(\$212)	\$1,022	\$2,257	\$3,492	\$4,726	\$5,961
	\$.65/\$2.90	\$103	\$1,427	\$2,752	\$4,077	\$5,401	\$6,726
	\$.75/\$2.90	\$213	\$1,570	\$2,926	\$4,282	\$5,638	\$6,995
50% / 25%/ 25%	\$.35 /\$2.45	(\$2,049)	(\$1,339)	(\$629)	\$81	\$791	\$1,501
	\$.40 /\$2.60	(\$1,580)	(\$736)	\$108	\$952	\$1,796	\$2,640
	\$.40 /\$2.80	(\$1,055)	(\$61)	\$933	\$1,927	\$2,921	\$3,915
	\$.50 /\$2.80	(\$904)	\$133	\$1,170	\$2,207	\$3,244	\$4,281
	\$.65/\$2.80	(\$678)	\$423	\$1,525	\$2,626	\$3,728	\$4,829
	\$.65/\$2.90	(\$416)	\$761	\$1,937	\$3,114	\$4,290	\$5,467
	\$.75/\$2.90	(\$265)	\$954	\$2,174	\$3,393	\$4,613	\$5,833
0% / 60%/ 40%	\$.35 /\$2.45	(\$1,339)	(\$427)	\$486	\$1,398	\$2,311	\$3,224
	\$.40 /\$2.60	(\$914)	\$120	\$1,154	\$2,189	\$3,223	\$4,257
	\$.40 /\$2.80	(\$494)	\$660	\$1,814	\$2,969	\$4,123	\$5,277
	\$.50 /\$2.80	(\$273)	\$944	\$2,162	\$3,379	\$4,596	\$5,814
	\$.65/\$2.80	\$59	\$1,371	\$2,683	\$3,995	\$5,307	\$6,619
	\$.65/\$2.90	\$269	\$1,641	\$3,013	\$4,385	\$5,757	\$7,129
	\$.75/\$2.90	\$490	\$1,925	\$3,360	\$4,795	\$6,230	\$7,666

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