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UNIVERSITY OF CALIFORNIA AGRICULTURE AND NATURAL RESOURCES  
COOPERATIVE EXTENSION  
AGRICULTURAL ISSUES CENTER  
UC DAVIS DEPARTMENT OF AGRICULTURAL AND RESOURCE ECONOMICS

**2020**  
**SAMPLE COSTS TO ESTABLISH**  
**Blue Elderberry**



**In a Hedgerow Without Tillage**  
Sacramento Valley

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**INTRODUCTION**

Sample costs to establish an elderberry tree hedgerow are presented in this study. It can be used to help guide production decisions, estimate potential returns, prepare budgets and evaluate production loans. Sample costs given for labor, materials, equipment and contract services are based on January 2020 figures. A blank column titled Your Costs is provided in Tables 1 and 2 for your convenience.

For an explanation of calculations used in the study, refer to the section titled Assumptions. For more information contact Donald Stewart, University of California Agriculture and Natural Resources, Agricultural Issues Center, Department of Agricultural and Resource Economics, at 530-752-4651 or [destewart@ucdavis.edu](mailto:destewart@ucdavis.edu). For more information contact Sonja Brodt, Academic Coordinator, UC SAREP at 530-754-8547 or [sbbrodt@ucdavis.edu](mailto:sbbrodt@ucdavis.edu). UC Davis, Agricultural Sustainability Institute.

Sample Cost of Production studies for many commodities are available and can be downloaded from the Department website, [coststudies.ucdavis.edu](http://coststudies.ucdavis.edu). Archived studies are also available on the website.

**Costs and Returns Study Program/Acknowledgements.** A “costs and returns” study is a compilation of specific crop data collected from meetings with professionals working in production agriculture from the region the study is based. The authors thank the farmer cooperators, UC Cooperative Extension and other industry representatives who provided information, assistance and expert advice. **The use of trade names and cultural practices in this report does not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products or cultural practices.** *The University is an affirmative action/equal opportunity employer.*

## ASSUMPTIONS

This study explains the annual costs associated with an ongoing operation, under the assumptions that the farm was operated this way in prior years and will continue in subsequent years. The costs, materials, and practices will not apply to all farms. Timing of and types of cultural practices will vary among growers within the region and from season to season due to variables such as weather, soil, insect and disease pressure.

**Farm.** The Pacific Star Garden farm consists of 40 contiguous acres owned by the operator. Three acres are planted in diversified vegetable and fruit crops sold through direct marketing channels. Two acres are planted to grain as feed for an on-site poultry operation. The remaining acreage is a mix of pasture, cover crop, hedgerows, and fallow. Approximately  $\frac{1}{4}$  acre of blue elderberry is planted in several discontinuous sites as habitat strips along canals which traverse the property. This planting corresponds to a 1,000 linear foot (LF) hedgerow 10 feet wide.

### Establishment: Cultural Practices and Material Inputs

**Crop.** Blue elderberry (*Sambucus nigra* ssp. *cerulea*) is a California native plant commonly included in habitat hedgerows, planted for their various ecological and environmental benefits. This study refers to blue elderberry as trees, although prolific shoots originating at the root crown commonly result in a bushy growth habit. Harvest of elderberry from such hedgerows for commercial sale or processing is not yet a common practice in California, but represents opportunity for an additional revenue stream which can contribute to overall farm economic sustainability, but also specifically to help recuperate costs of establishing hedgerows, which can be costly to install.

Hedgerows are commonly irrigated for three to four summer growing seasons to establish plants, after which point irrigation is removed completely. Mature blue elderberry thrives and yields prolifically with this type of management, assuming other environmental conditions are favorable. No formal data on the productive life span of blue elderberry exist, but a 2018/2019 UC SAREP study found that unirrigated blue elderberry trees 11 years old were highly productive (Table A). Observations by the author suggest that blue elderberry may be highly productive for at least 20 years in unirrigated hedgerows.

The establishment cost is the sum of cash costs for land preparation, planting, trees, production expenses, and cash overhead for growing the trees through the first year after planting. Establishment costs are based on typical basic operations, but can vary considerably,

depending upon terrain, soil type, local regulations, and other factors.

*Soil preparation.* No tillage was used; planting holes were dug into undisturbed soil. Site preparation consisted only of mowing resident vegetation.

*Mulch.* Sheets of cardboard were purchased from a manufacturer and laid in a circle around each seedling at planting time, overlapping each sheet approximately 3", for a total of approximately seven square feet of mulch per plant. Partially composted asparagus fern was spread manually over the cardboard at approximately 6-12" deep. An ATV and small trailer were used to distribute materials throughout each planting site. Asparagus fern was chosen for mulch because it was readily available free of charge from a nearby farm. Similar organic materials, such as straw, can also be used.

**Trees.** No blue elderberry cultivars exist. The price of wild-type blue elderberry plants depends on the source and number of plants purchased. For this study, the price per wild-type seedling (\$2.40 each) is based on prices for a bulk contract grow by a native plant restoration nursery with a minimum contract order of \$1,000. Excess seedlings are resold to other farmers.

**Planting.** Planting can take place in autumn, winter, or spring. California native plants such as blue elderberry are commonly planted in winter, when cool temperatures and winter rains increase the likelihood of successful establishment (especially for no-till plantings). For this study, planting occurs in late April. The irrigation system is installed prior to planting, with drip lines laid on top of mulch. Each seedling was planted directly next to an irrigation emitter, and a plastic tree protection tube with bamboo stake was installed immediately after planting.

Planting densities may range from 33 (30-foot spacing) to 167 (6-foot spacing) trees per 1,000LF. For this study 36 trees are planted in one row with an average of 27-foot spacing. The hedgerow (including the mulched area) is 10 feet wide. Individual blue elderberry plants may be closer or farther apart depending on existence of previously established trees and shrubs in the hedgerow. The life of the hedgerow at the time of planting is estimated at 25 years.

**Irrigation.** A drip irrigation system is installed prior to planting. The water is pumped from a well and passes through a filtration system into the above ground drip system. Water is applied to the hedgerow from April into October averaging every other week over the 25-week period. Irrigations early and late in the season may be less than twice per week. Water is applied through 5/8" poly tube with a single 1 gallon per hour woodpecker emitter per plant.

Irrigation costs are based on pumping costs. Pumping costs are \$0.003 per gallon, (\$49 per 1,000LF). Price of water will vary by grower depending on water source – well or district water, and water district. It is assumed that soil stored water from rainfall will supply a portion of the early season water requirements (this is not included in the applied water amounts). Irrigation begins at planting time in late April, continuing into October and applied every other week or as needed by the trees, depending on weather.

## **Production: Cultural Practices and Material Inputs**

**Pruning.** Elderberry trees are allowed to grow without pruning for at least one year after planting. In subsequent years, elderberry responds well to pruning. Throughout the Central Valley, however, there are restrictions on pruning blue elderberry due to possible presence of the endangered Valley Elderberry Longhorn Beetle. Farms below 500 ft elevation in the Central Valley must not prune any woody shoots larger than 1” diameter or damage or kill any trees once established (US FWS 2017). Programmatic Safe Harbor Agreements allow more leniency in managing elderberry on private land, and are available for landowners to join in counties throughout the Sacramento Valley (Sacramento River Forum).

**Irrigation.** Habitat hedgerows including drought tolerant California native species such as blue elderberry should be irrigated for three to four growing seasons to successfully establish plants. Irrigation frequency in year 3 and/or 4 is decreased relative to previous years to help plants acclimate to less frequent summer water. After 3 to 4 years, irrigation can generally be completely removed. In extremely dry years, occasional deep irrigation during fall/winter/spring months may be beneficial to maintain yields and plant vigor. Ongoing irrigation may be necessary in areas where the water table is especially deep.

**Pest Management.** The only pest management activity assumed is weed management. Circles of mulch effectively suppressed weeds during the growing season, requiring a single hand-weeding in October after the first growing season. Surrounding vegetation (mowed) was not problematic until the following winter, when weeds grew thickly and overtook circles of mulch. Tree protection tubes installed at planting time were also removed from vigorously growing trees that had become constricted by the tubes in October. Tubes were left in place for other seedlings which had grown less vigorously in order to more easily identify elderberry plants among surrounding vegetation.

## **Harvest, Yields and Revenue**

**Harvest.** Blue elderberry harvest begins in mid-June and extends through September. No mechanical elderberry harvesters are available. Ripe fruit is harvested using hand labor by cutting or pinching entire cymes from the tree. Harvest is not included in this study, as blue elderberry begins to yield in the second growing season.

**Yields.** Yields and returns over time are not included as part of this study; insufficient information exists on when blue elderberry reaches mature yield potential, or how much yield can be expected at maturity, especially at closer spacing like that in the system represented in this study. Results from a 2018/2019 study suggest that un-irrigated blue elderberry in Sacramento Valley hedgerows may reach maximum mature yield approximately 7-10 years after planting at wide spacing (15-30’) in favorable conditions. Results from this study are shown in Table A, which shows the average yield of destemmed berries per tree by planting year in 2018 and 2019 (n=3 for each planting year).

Blue elderberry seedlings in this study yielded an average of 0.3 lbs destemmed berries per tree in their second growing season. Lower early yield relative to other blue elderberry studies is

not necessarily indicative of long-term yield potential. Wide spacing of plants in this study may result in mature trees eventually reaching yields similar to those reported in Table A.

Table A.

Yields per Tree per Year		
	Yield (Lbs.) per Tree	
<u>Planting Year</u>	<u>2018</u>	<u>2019</u>
2014	36	63
2012	77	105
2008	108	119

**Revenue.** Revenue from first harvest in this system range from \$43 to \$65 for the 1,000LF or (\$4 to \$6/Lb. destemmed/tree). Revenue over time is difficult to predict accurately at this time (as stated above).

*Ranging Analysis.* The yields were such that a ranging analysis table is not representative of actual costs and revenue.

### Equipment, Labor and Operating Interest

**Equipment Operating Costs.** Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural & Biological Engineers (ASABE). Fuel and lubrication costs are also determined by ASABE equations based on maximum PTO horsepower, and fuel type. Prices for on-farm delivery of red dye diesel and gasoline are \$3.75 and \$3.40 per gallon, respectively. The cost includes a 13.0 percent sales tax on diesel and 2.25 percent sales tax on gasoline. Federal and state excise taxes on diesel (\$0.36/gal) and gasoline (\$0.42/gal) are refunded for on-farm use when filing the farm income tax return.

*Lube and Repairs.* The fuel, lube, and repair cost per acre (1,000LF) for each operation in Table 1 is determined by multiplying the total hourly operating cost in Table 6 for each piece of equipment used for the selected operation by the hours per acre (1,000LF). Tractor time is 10 percent higher than implement time for a given operation to account for setup, travel and down time.

**Labor.** Labor rates of \$20.67 per hour for machine operators and \$17.82 for irrigation and general labor includes payroll overhead of 42.56 percent. The basic hourly wages are \$14.50 for machine operators and \$12.50 for irrigation and general labor. The overhead includes the employer’s share of federal and California state payroll taxes (14.85%), workers' compensation insurance (11.29%) for truck crops, and a percentage for other possible benefits (16.42%).

Workers’ compensation costs will vary among growers, but the cost is based upon the average industry final rate as of January 2020. Labor for operations involving machinery are 20 percent higher than the operation time given in Table 1 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

**Interest on Operating Capital.** Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate. There is no operating loan, cash expenses were paid as received.

### **Cash Overhead**

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, and investment repairs.

**Property Taxes.** Counties charge a base property tax rate of 1 percent on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1 percent of the average value of the property.

**Insurance.** Insurance for farm investments varies depending on the assets included and the amount of coverage.

*Property Insurance.* This provides coverage for property loss and is charged at 0.866 percent of the average value of the assets over their useful life.

**Investment Repairs.** Annual maintenance except land is calculated as two percent of the purchase price.

### **Non-Cash Overhead**

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. The tractor and disc are the only investments included in the hedgerow establishment costs. Capital investments would be charged to other crops on the farm.

**Capital Recovery Costs.** Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). It is equivalent to the annual payment on a loan for the investment with the down payment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boehlje and Eidman). The formula for the calculation of the annual capital recovery costs is  $((\text{Purchase Price} - \text{Salvage Value}) \times \text{Capital Recovery Factor}) + (\text{Salvage Value} \times \text{Interest Rate})$ .

*Salvage Value.* Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements) the remaining value is a percentage of the new cost by ASABE based on equipment type and years of life. The life in years is estimated by dividing the wear out life, as given by ASABE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and

miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in the tables.

*Capital Recovery Factor.* Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. The amortization factor is a table value that corresponds to the interest rate used and the life of the machine.

*Interest Rate.* The interest rate of 6.0 percent used to calculate capital recovery cost is the effective long-term interest rate in January 2020. The interest rate is provided by a local farm lending agency and will vary according to risk and amount of loan.

**Land.** Land costs are not included in this study since it a hedgerow planting.

**Irrigation System.** The landlord maintains the irrigation system which includes the pump, filters and the lateral lines that connect to the emitters. These costs are distributed between other crops on the farm.

**Equipment.** Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60 percent to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are shown in the Whole Farm Annual Equipment, Investment, and Business Overhead Costs table. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in previous sections. The operating costs consist of repairs, fuel, and lubrication and are discussed under operating costs.

**Table Values.** Due to rounding, the totals may be slightly different from the sum of the components.



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**TABLE 1. COSTS PER 1,000LF TO ESTABLISH BLUE ELDERBERRIES**  
Hedgerow Without Tillage – 2020

Operation	Equipment Time (Hrs.)	Labor Cost	Fuel	Cash and Labor Costs per 1,000LF			Total Cost	Your Cost
				Lube & Repairs	Material Cost	Custom/ Rent		
<b>Pre-Plant:</b>								
Mow Planting Site 2x	1.85	49	13	14	0	0	76	
Irrigation/Layout Drip Lines	0.50	66	1	1	79	0	147	
<b>TOTAL PRE-PLANT COSTS</b>	<b>2.35</b>	<b>115</b>	<b>14</b>	<b>15</b>	<b>79</b>	<b>0</b>	<b>223</b>	
<b>Planting:</b>								
Plant: ATV4WD	1.85	49	3	2	0	0	54	
Plant: Trees/ Tubes/Stakes	0.00	151	0	0	138	0	288	
Plant: Layout Mulch/Labor	0.00	131	0	0	5	0	137	
<b>TOTAL PLANTING COSTS</b>	<b>1.85</b>	<b>331</b>	<b>3</b>	<b>2</b>	<b>143</b>	<b>0</b>	<b>479</b>	
<b>Cultural:</b>								
Irrigation 20x	0.00	301	0	0	49	0	350	
Weeds-Hand/Cut Tubes	0.00	20	0	0	0	0	20	
<b>TOTAL CULTURAL COSTS</b>	<b>0.00</b>	<b>321</b>	<b>0</b>	<b>0</b>	<b>49</b>	<b>0</b>	<b>370</b>	
<b>TOTAL OPERATING COSTS/1,000LF</b>	<b>4</b>	<b>767</b>	<b>17</b>	<b>17</b>	<b>271</b>	<b>0</b>	<b>1,072</b>	
<b>CASH OVERHEAD:</b>								
Property Taxes							2	
Property Insurance							2	
<b>TOTAL CASH OVERHEAD COSTS/1,000LF</b>							<b>4</b>	
<b>TOTAL CASH COSTS/1,000LF</b>							<b>1,076</b>	
<b>NON-CASH OVERHEAD:</b>								
		Per Producing 1,000LF		Annual Cost Capital Recovery				
Equipment		345		30				30
<b>TOTAL NON-CASH OVERHEAD COSTS</b>		<b>345</b>		<b>30</b>				<b>30</b>
<b>TOTAL COSTS/1,000LF</b>							<b>1,106</b>	

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**TABLE 2. COSTS AND RETURNS PER 1,000LF TO ESTABLISH BLUE ELDERBERRIES**

Hedgerow Without Tillage – 2020

	Quantity/ 1,000LF	Unit	Price or Cost/Unit	Value or Cost/1,000LF	Your Cost
<b>GROSS RETURNS</b>					
Fruit	9	Lbs.	5.00	45	
<b>TOTAL GROSS RETURNS</b>				45	
<b>OPERATING COSTS</b>					
<b>Trees:</b>				<b>217</b>	
Irrigation Hose 5/8"	1,000.00	Foot	0.06	60	
Drip Emitters (Woodpecker)	108.00	Each	0.18	19	
Trees: Blue Elderberry	36.00	Each	2.40	86	
Plant Tubes	36.00	Each	1.35	49	
Planting Stakes	36.00	Each	0.07	3	
<b>Fertilizer:</b>				<b>5</b>	
Asparagus Chaff	252.00	CuFt	0.00	0	
Cardboard Mulch	36.00	Sheet	0.15	5	
<b>Irrigation:</b>				<b>49</b>	
Water (\$/Gal)	16,200.00	Gal	0.003	49	
<b>Labor</b>				<b>767</b>	
Equipment Operator Labor	5.04	hrs	21.97	111	
Irrigation Labor	20.00	hrs	17.72	354	
Planting Labor	15.90	hrs	17.72	282	
Manual Labor	1.11	hrs	17.72	20	
<b>Machinery</b>				<b>34</b>	
Fuel-Gas	1.18	gal	3.52	4	
Fuel-Diesel	3.50	gal	3.66	13	
Lube				3	
Machinery Repair				15	
<b>TOTAL OPERATING COSTS/1,000LF</b>				1,072	
<b>NET RETURNS ABOVE OPERATING COSTS</b>				-1,027	
<b>CASH OVERHEAD COSTS</b>					
Property Taxes				2	
Property Insurance				2	
<b>TOTAL CASH OVERHEAD COSTS/1,000LF</b>				4	
<b>TOTAL CASH COSTS/1,000LF</b>				1,076	
<b>NON-CASH OVERHEAD COSTS (Capital Recovery)</b>				30	
<b>TOTAL NON-CASH OVERHEAD COSTS/1,000LF</b>				30	
<b>TOTAL COST/1,000LF</b>				1,106	

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**TABLE 3. MONTHLY CASH COSTS PER 1,000LF TO ESTABLISH BLUE ELDERBERRIES**  
Hedgerow Without Tillage – 2020

	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	Total
Pre-Plant:										
Mow Planting Site 2x	38		38							76
Irrigation/Layout Drip Lines			147							147
<b>TOTAL PRE-PLANT COSTS</b>	<b>38</b>		<b>185</b>							<b>223</b>
Planting:										
Plant: ATV4WD			54							54
Plant: Trees/ Tubes/Stakes			288							288
Plant: Layout Mulch/Labor			137							137
<b>TOTAL PLANTING COSTS</b>	<b>0</b>		<b>479</b>							<b>479</b>
Cultural: Irrigation										
20x			51	51	51	51	51	51	42	350
Weeds-Hand/Cut Tubes									20	20
<b>TOTAL CULTURAL COSTS</b>	<b>0</b>		<b>51</b>	<b>51</b>	<b>51</b>	<b>51</b>	<b>51</b>	<b>51</b>	<b>62</b>	<b>370</b>
<b>TOTAL OPERATING COSTS/1,000LF</b>	<b>38</b>	<b>0</b>	<b>716</b>	<b>51</b>	<b>51</b>	<b>51</b>	<b>51</b>	<b>51</b>	<b>62</b>	<b>1,072</b>
CASH OVERHEAD										
Property Taxes	1							1		2
Property Insurance	1							1		2
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>4</b>
<b>TOTAL CASH COSTS/1,000LF</b>	<b>40</b>		<b>716</b>	<b>51</b>	<b>51</b>	<b>51</b>	<b>51</b>	<b>53</b>	<b>62</b>	<b>1,076</b>

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**TABLE 4. WHOLE FARM ANNUAL EQUIPMENT OVERHEAD COSTS**  
Hedgerow Without Tillage – 2020

ANNUAL EQUIPMENT COSTS

Description	Price	Yrs. Life	Salvage Value	Capital Recovery	Cash Overhead		
					Insurance	Taxes	Total
John Deere 4WD Tractor	33,000	20	4,234	2,762	165	186	3,113
Bush Hog Rotary Mower	7,500	20	391	643	35	39	718
ATV-4WD	6,500	15	1,265	615	34	39	688
ATV Trailer	1,500	25	45	117	7	8	131
<b>TOTAL</b>	<b>48,500</b>	<b>-</b>	<b>5,936</b>	<b>4,137</b>	<b>241</b>	<b>272</b>	<b>4,650</b>

ANNUAL INVESTMENT COSTS

None

ANNUAL BUSINESS OVERHEAD COSTS

None

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**TABLE 5. HOURLY EQUIPMENT COSTS**  
Hedgerow Without Tillage – 2020

Description	Elderberry Hours Used	Capital Recovery	Cash Overhead			Lube & Repairs	Operating Fuel	Total Oper.	Total Costs/Hr.
			Insurance	Taxes					
John Deere 4WD Tractor	2	3.45	0.21	0.23	2.23	6.29	8.52	12.41	
Bush Hog Rotary Mower	2	6.43	0.35	0.39	5.35	0.00	5.35	12.53	
ATV-4WD	2	4.62	0.26	0.29	1.27	1.76	3.03	8.21	
ATV Trailer	1	1.17	0.07	0.08	0.04	0.00	0.04	1.35	

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**TABLE 6. OPERATIONS WITH EQUIPMENT & MATERIALS**

Hedgerow Without Tillage – 2020

Operation	Operation Month	Tractor	Implement	Labor Type/ Material	Rate/ 1,000LF	Unit
Mow Planting Site 2x	Feb	John Deere 4WD Tractor	Bush Hog Rotary Mower	Equipment Operator Labor	1 11	hours
	Apr	John Deere 4WD Tractor	Bush Hog Rotary Mower	Equipment Operator Labor	1 11	hours
Irrigation/Layout Drip	Apr		ATV-4WD	Equipment Operator Labor	0.60	hour
				Irrigation Hose 5/8"	1,000.00	Foot
			ATV Trailer	Drip Emitters (Woodpecker)	108.00	Each
	Apr			Irrigation Labor	3.00	hours
Plant:	Apr		ATV-4WD	Equipment Operator Labor	2 22	hours
Plant: Trees/ Tubes	Apr			Planting Labor	8 50	hours
				Trees: Blue Elderberry	36.00	Each
				Plant Tubes	36.00	Each
				Planting Stakes	36.00	Each
Plant: Layout Mulch	Apr			Planting Labor	7.40	hours
				Asparagus Chaff	252.00	CuFt
				Cardboard Mulch	36.00	Sheet
Irrigation 20x	Apr			Irrigation Labor	2.50	hours
				Water (\$/Gal)	2,314.26	Gal
	May			Irrigation Labor	2.50	hours
				Water (\$/Gal)	2,314.29	Gal
	June			Irrigation Labor	2.50	hours
				Water (\$/Gal)	2,314.29	Gal
	July			Irrigation Labor	2.50	hours
				Water (\$/Gal)	2,314.29	Gal
	Aug			Irrigation Labor	2.50	hours
				Water (\$/Gal)	2,314.29	Gal
	Sept			Irrigation Labor	2.50	hours
				Water (\$/Gal)	2,314.29	Gal
	Oct			Irrigation Labor	2.00	hours
				Water (\$/Gal)	2,314.29	Gal
Weeds-Hand/Cut Tubes	Oct			Manual Labor	1 11	hours