
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 Multi-species Hedgerow with 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. For more information contact Sonja Brodt, Academic Coordinator, UC SAREP at 530-754-8547 or sbrodt@ucdavis.edu. UC Davis, Agricultural Sustainability Institute. elderberry.ucdavis.edu

Sample Cost of Production studies for many commodities are available and can be downloaded from the Department website, 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 Cloverleaf farm consists of 8 contiguous leased acres of diversified vegetable and fruit crops on Class I agricultural soil. The majority of income is derived from direct marketing and direct to retail marketing of fresh produce, with value added product sales from an on-farm processing kitchen contributing a significant but lesser portion of gross income. Blue elderberry is planted on approximately $\frac{1}{4}$ acre in a strip bordering a cropped field, in a 1,000 linear foot (LF) multi-species hedgerow.

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. After mowing resident vegetation, the planting site was ripped at a depth of three feet to break up compaction from previous use as an access road. The site was then rototilled several times to create a relatively fine, smooth planting bed. No soil amendments were added.

Mulch. Cardboard sheets were purchased from a manufacturer and laid over the entire planting bed, overlapping each sheet by approximately 3". As the cardboard was being laid down, a hydraulic tractor fork lift was used to distribute piles of partially composted asparagus fern which was then manually spread over the cardboard 6-12" deep using pitchforks. Asparagus fern was chosen for mulch as it existed on-site as a waste product of other farming operations.

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 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, 96 trees are planted on 10 foot spacing, in one contiguous row within a wide, three-row multispecies hedgerow all planted on the same day. The width of the elderberry row (i.e. distance from other plants in the hedgerow) is also 10 feet. Labor and material costs for installing native plants other than elderberry are not included in this study. 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 weekly over the 25-week period. Irrigations early and late in the season may be less than weekly. 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, (\$59 per 1,000 Linear Feet). Price of water will vary by grower depending on water source – well or district water and water district. It is assumed 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 weekly 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 should be decreased in year 3 and/or 4 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. For this study, the only pest management activity assumed is weed management. Elderberries were hand-weeded with hoes and shovels in May and June only. No other weed suppression was required until the following spring after winter rains began to germinate weed seeds that had fallen into the organic mulch.

Tree protection tubes installed at planting time were removed as soon as foliage and basal sprouts came into contact with plastic tube walls.

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 11 lbs of destemmed berries per tree in their second growing season. Because trees are spaced relatively closely (10 feet apart) mature yield is likely to be lower than reported in Table A, and may be achieved earlier.

Table A.

<u>Planting Year</u>	<u>Yields per Tree per Year</u>	
	<u>Yield (Lbs.) per Tree</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 \$4,224 - \$6,336 per 1,000LF, at (\$4 - \$6 per Lb. destemmed). This assumes that the berries are sold fresh, whole and destemmed.

Revenue will differ depending on post-harvest processing and final market. Revenue over time is difficult to predict accurately at this time (as stated above).

Ranging Analysis. Table 4 shows a range of yields for the first harvest season, 996 – 1,116 Lbs. per 1,000LF, (9-13 Lbs./tree of destemmed berries) over a range of prices, \$3.95 - \$6.05 per pound.

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
 Multi-species Hedgerow with Tillage – 2020

Operation	Equipment Time (Hrs.)	Cash and Labor Costs per 1,000LF					Total Cost	Your Cost
		Labor Cost	Fuel	Lube & Repairs	Material Cost	Custom/ Rent		
Pre-Plant:								
Rip Planting Site (3' Depth)	0.00	0	0	0	0	58	58	
Rototill Planting Area 3x	5.00	132	23	34	0	0	188	
Layout Mulch Materials	0.00	0	0	0	214	0	214	
Layout Mulch: Tractor/Labor	15.00	395	68	43	0	0	507	
Layout Mulch Manual Labor	0.00	266	0	0	0	0	266	
TOTAL PRE-PLANT COSTS	20.00	793	91	76	214	58	1,232	
Planting:								
Plant Trees/Flag/Irrigate (96)	0.00	213	0	0	367	0	579	
Layout Irrigation Lines	0.00	35	0	0	81	0	116	
TOTAL PLANTING COSTS	0.00	248	0	0	448	0	696	
Cultural:								
Irrigation 19x	0.00	106	0	0	59	0	166	
Hand Weed 2x	0.00	142	0	0	0	0	142	
TOTAL CULTURAL COSTS	0.00	248	0	0	59	0	307	
TOTAL OPERATING COSTS/1,000LF	20.00	1,289	91	76	721	58	2,235	
CASH OVERHEAD:								
Property Taxes							9	
Property Insurance							8	
TOTAL CASH OVERHEAD COSTS/1,000LF							17	
TOTAL CASH COSTS/1,000LF							2,253	
NON-CASH OVERHEAD:								
		Per Producing Acre		Annual Cost Capital Recovery				
Equipment		1,639		144			144	
TOTAL NON-CASH OVERHEAD COSTS		1,639		144			144	
TOTAL COSTS/1,000LF							2,397	

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TABLE 2. COSTS AND RETURNS PER 1,000LF TO ESTABLISH BLUE ELDERBERRIES
 Multi-species Hedgerow with Tillage – 2020

	Quantity/ 1,000LF	Unit	Price or Cost/Unit	Value or Cost/1,000LF	Your Cost
GROSS RETURNS					
Fruit	1,056	Lb.	5.00	5,280	
TOTAL GROSS RETURNS				5,280	
OPERATING COSTS					
Trees:				448	
Trees: Blue Elderberry	96.00	Each	2.40	230	
Plant Tubes	96.00	Each	1.35	130	
Planting Stakes	96.00	Each	0.07	7	
Irrigation Tubing (5/8")	1.00	Roll	63.76	64	
Drip Emitters (Woodpecker)	96.00	Each	0.18	17	
Fertilizer:				214	
Cardboard Mulch	1,428.00	Sheet	0.15	214	
Asparagus Chaff	5,000.00	CuFt	0.00	0	
Irrigation:				59	
Water (\$/Gal)	19,776.00	Gal	0.003	59	
Custom:				58	
Subsoil 3' Depth	0.23	Acre	250.00	58	
Labor				1,289	
Equipment Operator Labor	24.00	hrs	21.97	527	
Manual Labor	23.00	hrs	17.72	408	
Planting Labor	12.00	hrs	17.72	213	
Irrigation Labor	8.00	hrs	17.72	142	
Machinery				167	
Fuel-Gas	0.00	gal	3.52	0	
Fuel-Diesel	24.85	gal	3.66	91	
Lube				14	
Machinery Repair				63	
TOTAL OPERATING COSTS/1,000LF				2,235	
TOTAL OPERATING COSTS/LB.				2	
NET RETURNS ABOVE OPERATING COSTS				3,045	
CASH OVERHEAD COSTS					
Property Taxes				9	
Property Insurance				8	
TOTAL CASH OVERHEAD COSTS/1,000LF				17	
TOTAL CASH COSTS/1,000LF				2,253	
NET RETURNS ABOVE CASH COSTS				3,027	
NON-CASH OVERHEAD COSTS (Capital Recovery)				144	
TOTAL NON-CASH OVERHEAD COSTS/1,000LF				144	
TOTAL COST/1,000LF				2,397	
NET RETURNS ABOVE TOTAL COST				2,883	

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TABLE 3. MONTHLY CASH COSTS PER 1,000LF TO ESTABLISH BLUE ELDERBERRIES
 Multi-species Hedgerow with Tillage – 2020

	MAR	APR	MAY	JUN	JUL	AUG	SEP	Total
Pre-Plant:								
Rip Planting Site (3' Depth)	58							58
Rototill Planting Area 3x	188							188
Layout Mulch Materials		214						214
Layout Mulch: Tractor/Labor		507						507
Layout Mulch Manual Labor		266						266
TOTAL PRE-PLANT COSTS	246	987						1,232
Planting:								
Plant Trees/Flag/Irrigate (96)		579						579
Layout Irrigation Lines		116						116
TOTAL PLANTING COSTS	0	696						696
Cultural:								
Irrigation 19x		21	30	33	27	27	27	166
Hand Weed 2x			71	71				142
TOTAL CULTURAL COSTS	0	21	101	104	27	27	27	307
TOTAL OPERATING COSTS/1,000LF	246	1,703	101	104	27	27	27	2,235
CASH OVERHEAD								
Property Taxes							5	9
Property Insurance							4	8
Investment Repairs	0	0	0	0	0	0	0	0
TOTAL CASH OVERHEAD COSTS	0	0	0	0	0	0	9	17
TOTAL CASH COSTS/1,000LF	246	1,703	101	104	27	27	36	2,253

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TABLE 4. RANGING ANALYSIS

Multi-species Hedgerow with Tillage – 2020

COSTS PER 1,000LF AT VARYING YIELDS TO PRODUCE BLUE ELDERBERRY

	YIELD (LBS.)						
	996.00	1,016.00	1,036.00	1,056.00	1,076.00	1,096.00	1,116.00
OPERATING COSTS/1,000LF:							
Pre-Plant	1,232	1,232	1,232	1,232	1,232	1,232	1,232
Planting	696	696	696	696	696	696	696
Cultural	307	307	307	307	307	307	307
TOTAL OPERATING COSTS/1,000LF	2,235	2,235	2,235	2,235	2,235	2,235	2,235
TOTAL OPERATING COSTS/LB.	2.24	2.20	2.16	2.12	2.08	2.04	2.00
CASH OVERHEAD COSTS/1,000LF	17	17	17	17	17	17	17
TOTAL CASH COSTS/1,000LF	2,253	2,253	2,253	2,253	2,253	2,253	2,253
TOTAL CASH COSTS/LB.	2.26	2.22	2.17	2.13	2.09	2.06	2.02
NON-CASH OVERHEAD COSTS/1,000LF	144	144	144	144	144	144	144
TOTAL COSTS/1,000LF	2,397	2,397	2,397	2,397	2,397	2,397	2,397
TOTAL COSTS/LB.	2.41	2.36	2.31	2.27	2.23	2.19	2.15

Net Return Per 1,000LF Above Operating Costs for Cloverleaf Elderberry

PRICE (\$/lb.)	YIELD (lbs./1,000LF)						
	Fruit	996.00	1016.00	1036.00	1056.00	1076.00	1096.00
3.95	1,699	1,778	1,857	1,936	2,015	2,094	2,173
4.30	2,047	2,133	2,219	2,305	2,391	2,477	2,563
4.65	2,396	2,489	2,582	2,675	2,768	2,861	2,954
5.00	2,745	2,845	2,945	3,045	3,145	3,245	3,345
5.35	3,093	3,200	3,307	3,414	3,521	3,628	3,735
5.70	3,442	3,556	3,670	3,784	3,898	4,012	4,126
6.05	3,790	3,911	4,032	4,153	4,274	4,395	4,516

Net Return Per 1,000LF Above Cash Costs for Cloverleaf Elderberry

PRICE (\$/lb.)	YIELD (lbs./1,000LF)						
	Fruit	996.00	1016.00	1036.00	1056.00	1076.00	1096.00
3.95	1,682	1,761	1,840	1,919	1,998	2,077	2,156
4.30	2,030	2,116	2,202	2,288	2,374	2,460	2,546
4.65	2,379	2,472	2,565	2,658	2,751	2,844	2,937
5.00	2,727	2,827	2,927	3,027	3,127	3,227	3,327
5.35	3,076	3,183	3,290	3,397	3,504	3,611	3,718
5.70	3,425	3,539	3,653	3,767	3,881	3,995	4,109
6.05	3,773	3,894	4,015	4,136	4,257	4,378	4,499

Net Return Per 1,000LF Above Total Costs for Cloverleaf Elderberry

PRICE (\$/lb.)	YIELD (lbs./1,000LF)						
	Fruit	996.00	1016.00	1036.00	1056.00	1076.00	1096.00
3.95	1,538	1,617	1,696	1,775	1,854	1,933	2,012
4.30	1,886	1,972	2,058	2,144	2,230	2,316	2,402
4.65	2,235	2,328	2,421	2,514	2,607	2,700	2,793
5.00	2,583	2,683	2,783	2,883	2,983	3,083	3,183
5.35	2,932	3,039	3,146	3,253	3,360	3,467	3,574
5.70	3,281	3,395	3,509	3,623	3,737	3,851	3,965
6.05	3,629	3,750	3,871	3,992	4,113	4,234	4,355

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 5. WHOLE FARM ANNUAL EQUIPMENT OVERHEAD COSTS
 Multi-species Hedgerow with Tillage – 2020

ANNUAL EQUIPMENT COSTS							
Description	Price	Yrs. Life	Salvage Value	Capital Recovery	Cash Overhead		Total
					Insurance	Taxes	
Rototiller	8,500	15	816	840	41	47	928
Kubota B9200	28,000	20	3,593	2,344	140	158	2,641
Forklift Attachment	2,500	20	139	214	12	13	239
TOTAL	39,000	-	4,548	3,398	193	218	3,808

ANNUAL INVESTMENT COSTS

None

ANNUAL BUSINESS OVERHEAD COSTS

None

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 6. HOURLY EQUIPMENT COSTS
 Multi-species Hedgerow with Tillage – 2020

Description	Elderberry Hours Used	Capital Recovery	Cash Overhead		Operating		Total Oper.	Total Costs/Hr.
			Insurance	Taxes	Lube & Repairs	Fuel		
Rototiller	5	8.40	0.41	0.47	3.93	0.00	3.93	13.21
Kubota B9200	22	3.91	0.23	0.26	2.53	4.13	6.66	11.06
Forklift Attachment	15	1.07	0.06	0.07	0.08	0.00	0.08	1.27

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER

TABLE 7. OPERATIONS WITH EQUIPMENT & MATERIALS

Multi-species Hedgerow with Tillage – 2020

Operation	Operation Month	Tractor	Implement	Labor Type/ Material	Rate/ acre	Unit
Rip Planting Site	Mar			Subsoil 3' Depth	0.23	Acre
Rototill	Mar	Kubota B9200	Rototiller	Equipment Operator Labor	6.00	hours
Layout Mulch Material	Apr			Cardboard Mulch	1,428.00	Sheet
				Asparagus Chaff	5,000.00	CuFt
Layout Mulch: Tractor	Apr	Kubota B9200	Forklift Attachment	Equipment Operator Labor	18.00	hours
Layout Mulch Manual	Apr			Manual Labor	15.00	hours
Plant Trees/Flag	Apr			Planting Labor	12.00	hours
				Trees: Blue Elderberry	96.00	Each
				Plant Tubes	96.00	Each
				Planting Stakes	96.00	Each
Layout Irrigation Lines	Apr			Irrigation Labor	2.00	hours
				Irrigation Tubing (5/8")	1.00	Roll
				Drip Emitters (Woodpecker)	96.00	Each
Irrigation 19x	Apr			Irrigation Labor	1.00	hour
				Water (\$/Gal)	1,048.20	Gal
	May			Irrigation Labor	1.00	hour
				Water (\$/Gal)	4,158.85	Gal
	June			Irrigation Labor	1.00	hour
				Water (\$/Gal)	5,211.55	Gal
	July			Irrigation Labor	1.00	hour
				Water (\$/Gal)	3,120.00	Gal
	Aug			Irrigation Labor	1.00	hour
				Water (\$/Gal)	3,118.70	Gal
	Sept			Irrigation Labor	1.00	hour
				Water (\$/Gal)	3,118.70	Gal
Hand Weed 2x	May			Manual Labor	4.00	hours
	June			Manual Labor	4.00	hours