

U.C. COOPERATIVE EXTENSION

~ CENTRAL COAST CONSERVATION PRACTICES ~

ESTIMATED COSTS AND POTENTIAL BENEFITS FOR A PERENNIAL HEDGEROW PLANTING 2003

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INTRODUCTION & GENERAL DESCRIPTION

This study is intended as an estimate or guide, which can be helpful in evaluating management decisions related to the installation (plant establishment) and maintenance of a hedgerow planting. Hedgerow plantings are 'living fences' of perennial trees, shrubs and/or grasses. Hedgerows serve a variety of purposes and may be designed to accommodate site-specific conditions. Hedgerow plantings have the potential to increase water penetration and infiltration, slow the flow of surface water runoff, and reduce water and wind erosion thereby contributing to the protection and maintenance of downstream water quality. Hedgerows may also provide habitat for beneficial insects and wildlife, increase plant diversity and improve aesthetics on-farm, and assist with weed management. In addition, some farmers may derive income from saleable foliage, flowers and herbs from hedgerow plantings.

Costs for the installation, operation and maintenance of the hedgerow in this study are estimated for low, representative and high cost scenarios in Table 1. More detailed information for the representative cost scenario is included in Table 2 (installation, operation and maintenance) and Table 3 (materials). In-kind contributions from federal and other local assistance programs may be available to offset direct expenses borne by the farmers and ranchers adopting this conservation practice. Land ownership and rental rates are specific to each operation and therefore are not included in the analysis. Estimated costs given for labor, materials, and custom or contract services are based on current figures. The costs and practices contained in this study may not be applicable to all situations or used every year. Individual farmers and ranchers should therefore use this study as a template and make adjustments to more accurately reflect their own situations. The use of trade names does not constitute an endorsement or a recommendation by the University of California nor is criticism of similar products implied.

The following is a description of general assumptions pertaining to the conservation practice analyzed in this study. The operations are those currently used by farmers and ranchers within six counties on the Central Coast of California: San Mateo, Santa Cruz, Santa Clara, San Benito, Monterey and San Luis Obispo.

PRACTICE COSTS

Installation (Plant Establishment). This study assumes that a hedgerow (1,000 linear feet with an 8 foot width) is planted to relatively flat land that is not otherwise farmed. Costs for the hedgerow planting studied

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here include charges for land preparation (to cultivate and ridge up soil) and a compost application prior to planting. A temporary drip irrigation system is installed and the site is pre-irrigated. Perennial species, including a variety of tall, medium and short stature shrubs are then planted by hand and irrigated with the drip system. A straw mulch is applied after planting and irrigating to assist with weed management and soil moisture retention. Associated costs are located on Tables 1, 2, and 3.

There are many different approaches to establishing hedgerows. For example, plant species are selected for their sub-regional appropriateness and can therefore vary greatly. Plant spacing, thus density, will also vary. Growers may also choose to irrigate using removable sprinklers rather than installing a temporary drip system. Mulching materials can also vary and are selected for reasons such as availability and cost, rate of decomposition, and the ability to help with soil moisture retention and weed management. Growers should also consider disease and nutrient management when selecting mulches.

Operation & Maintenance. Operation and maintenance costs are incurred as a part of this conservation practice. Depending on seasonal rainfall and plant needs, the hedgerow is irrigated one or more additional years to improve the stand and maintain the hedgerow. Also, eight percent of the total plant numbers are assumed to be replanted during the first years of establishment. The area in and around plants is hand weeded (hoe and/or weed string implement) to insure good growth of the hedgerow by decreasing competition for water and nutrients. In addition, a cost for rodent control (traps and labor) is included here. Costs are included on Tables 1, 2, and 3.

Additional Fees and Expenses. When using conservation practices, additional fees and expenses are sometimes incurred for consultants, permits or other charges that are specific to a particular practice. For this study, no specialized fees or costs for hedgerow plantings are assumed.

POTENTIAL BENEFITS AND DRAWBACKS OF PRACTICE

Farmers, ranchers and landowners should evaluate each conservation practice for potential benefits and drawbacks. This includes risk and its effect on equipment, labor and capital with respect to the overall operation.

Benefits. Many factors affect potential benefits associated with hedgerow plantings, including site planted, slope of land, plant species selected and density of planting. Because of the difficulty in valuing both short and long-term benefits, no cost savings is assumed for this study. Potential benefits of hedgerow plantings include reduced on-farm water and wind erosion, which may ultimately contribute to the protection and maintenance of downstream water quality. Preventing or minimizing downstream impacts and/or property damage may reduce conflicts with neighbors and exposure to legal and regulatory actions. Additional benefits can include improved on-farm aesthetics and habitat for beneficial insects and wildlife. Also, for cash crops that are especially sensitive to wind damage, some improvement in productivity may occur.

Drawbacks. To accommodate for the planting of a hedgerow, farmers sometimes report taking revenue-generating land out of production. In this case, a loss in revenue would be assumed. Individual growers may refer to the website <http://coststudies.ucdavis.edu> to view cost of production studies and calculate potential revenue losses associated with various cash crops. It is also important to note that, in addition to beneficial arthropods, hedgerows may also attract arthropod and vertebrate pests. In this case, hedgerow plantings may require more intensive management and may result in additional operation and maintenance costs. However,

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hedgerows can often be designed, and plant species selected, to help minimize damage, thus costs, associated with insect and vertebrate pests.

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ADDITIONAL INFORMATION

For additional information about the calculations used in this report, call Laura Tourte, UCCE Santa Cruz County (831) 763-8040. Additional information about the practice itself may be accessed via the internet through UCCE at <http://waterquality.ucanr.org> and NRCS at <http://www.nrcs.usda.gov/technical>.

Copies of this study may be requested through local UCCE, NRCS, and Resource Conservation District (RCD) offices in the six counties listed above. Additional publications with estimated costs and potential benefits for various other conservation practices are also available through Central Coast UCCE, NRCS, and RCD offices. They may also be accessed on the Internet at <http://cesantacruz.ucdavis.edu>.

Resources focused specifically on hedgerow plantings, and their implementation, can be found on the UC Agricultural and Natural Resources (UC ANR) publications catalog website at <http://ucanr.org> or on the UC Sustainable Agriculture Research and Education Program (SAREP) website at <http://www.sarep.ucdavis.edu> using the 'search site' for hedgerows and enhancing biological control, or on the Community Alliance with Family Farmers (CAFF) website <http://caff.org/caff/programs/Farmscaping/hedgerowin.html>. ANR publication catalogs and other resource materials are also available at your local UCCE office. You may also call or visit your local NRCS or RCD office.

PRINT MATERIALS

Bring Farm Edges Back to Life. 2001. Fifth Edition. Editors: Paul Robbins, Rebecca Holmes, and Katherine Laddish. Yolo County Resource Conservation District.

Enhancing Biological Control. Habitat Management to Promote Natural Enemies of Agricultural Pests. 1998. Editors: Charles H. Pickett and Robert L. Bugg. University of California Press. Berkeley and Los Angeles, CA.

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Table 1. Perennial Hedgerow Planting (1,000 Linear Feet) - Partial Budget - Central Coast - 2003

COSTS PER UNIT*	ESTIMATED COSTS			ADDITIONAL RETURNS PER UNIT	POTENTIAL BENEFITS		
	LOW	REP**	HIGH		LOW	REP	HIGH
<i>Installation (Year 1):</i>				None	\$0	\$0	\$0
Land Prep - Rip	\$0	\$21	\$41				
Land Prep - Disc	\$0	\$14	\$21				
Compost Application	\$0	\$28	\$55				
Set Up Irrigation System & Pre-irrigate	\$21	\$516	\$668				
Plant Perennial Shrubs	\$955	\$1,669	\$2,215				
Irrigate to Establish	\$0	\$6	\$6				
Mulch Around Plants	\$0	\$109	\$137				
<i>(1a) Installation - Subtotal</i>	<i>\$976</i>	<i>\$2,363</i>	<i>\$3,143</i>				
<i>Annual Operation & Maintenance (Years 2-5):</i>							
Irrigate to Maintain	\$21	\$17	\$17				
Replant to Maintain	\$74	\$140	\$180				
Hand Weed Around Plants	\$134	\$268	\$402				
Rodent Control - Trap	\$51	\$90	\$140				
<i>(1b) Ann. Oper. & Maint. Costs - Subtotal</i>	<i>\$280</i>	<i>\$515</i>	<i>\$739</i>				
<i>Interest on Operating Capital @ 7.4%</i>	<i>\$20</i>	<i>\$40</i>	<i>\$56</i>				
<i>(1c) Costs - Subtotal (1a+1b)</i>	<i>\$1,276</i>	<i>\$2,918</i>	<i>\$3,938</i>	<i>(5) Additional Returns - Subtotal</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>
REDUCED RETURNS PER UNIT	LOW	REP	HIGH	REDUCED COSTS PER UNIT	LOW	REP	HIGH
None	\$0	\$0	\$0	Labor & Equip. Use for Prevention & Repairs (Associated with Flood Control & Storm Events)	***	***	***
<i>(2) Reduced Returns - Subtotal</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>	<i>(6) Reduced Costs - Subtotal</i>	<i>***</i>	<i>***</i>	<i>***</i>
COSTS & REDUCED RETURNS	LOW	REP	HIGH	ADD. RETURNS & REDUCED COSTS	LOW	REP	HIGH
<i>(3) Total Per Unit Year 1 (1c+2)</i>	<i>\$1,276</i>	<i>\$2,918</i>	<i>\$3,938</i>	<i>(7) Total Per Unit Year 1 (5+6)</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>
<i>(4) Total Per Unit Per Year - Years 2-5 (1b+2)</i>	<i>\$280</i>	<i>\$515</i>	<i>\$739</i>	<i>(8) Total Per Unit Per Year - Years 2-5 (5+6)</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>
NET CHANGE IN INCOME PER UNIT (1,000 LINEAR FEET) YEAR 1 (7-3)					-\$1,276	-\$2,918	-\$3,938
NET CHANGE IN INCOME PER UNIT (1,000 LINEAR FEET) PER YEAR - YEARS 2-5 (8-4)					-\$280	-\$515	-\$739
NET CHANGE IN INCOME PER LINEAR FOOT YEAR 1					-\$1	-\$3	-\$4
NET CHANGE IN INCOME PER LINEAR FOOT YEARS 2-5					****	-\$1	-\$1

* Unit = 1,000 linear feet.

** Rep = Representative cost.

*** No reduced costs are assumed for this study, but may apply in some situations.

**** Cost is negligible when represented on a linear foot basis.

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Table 2. Detail of Representative Installation, Operation & Maintenance Costs[†]
Perennial Hedgerow Planting (1,000 Linear Feet) – Central Coast 2003

Operation	Non-Mach Labor		Machine Labor		Custom Work		Material Cost (\$/1000 LF) [‡]	Total Cost (\$/1000LF) [¶]	Your Cost (\$/1000LF)
	Hrs/ 1000LF	Cost/ 1000LF	Hrs/ 1000LF	Cost/ 1000LF	Hrs/ 1000LF	Cost/ 1000LF			
<i>Installation (Year 1):</i>									
Land Prep – Rip 1X			.8	16			5 [§]	21	
Land Prep – Disc 2X			.5	10			4 [§]	14	
Compost Application	1.5	20					8	28	
Install Drip System & Pre-irrigate	10	134					382	516	
Plant Perennials – Shrubs & Grasses	40	536	1.5	31			1,102 [§]	1,669	
Irrigate to Establish	.3	3					3	6	
Mulch Around Plants	1.5	21	1	27			61 [§]	109	
<i>Subtotal</i>		<i>714</i>		<i>84</i>			<i>1,565</i>	<i>2,363</i>	
<i>Annual Operation & Maint. (Years 2-5):</i>									
Irrigate to Maintain	.8	10					7	17	
Replant to Maintain	3.3	44	.3	6			90	140	
Hand Weed Around Plants	20	268					0	268	
Rodent Control - Trap	4	54					36	90	
<i>Subtotal</i>		<i>376</i>		<i>6</i>			<i>133</i>	<i>515</i>	
<i>Interest on Operating Capital @ 7.4%</i>								<i>40</i>	
<i>Total Costs Per Unit (1000 LF) – Year 1</i>							<i>1,698</i>	<i>2,918</i>	
<i>Total Costs Per Unit (1000 LF) Per Year – Yrs 2-5</i>							<i>133</i>	<i>515</i>	
<i>Total Costs Per Linear Foot – Year 1</i>							<i>2</i>	<i>3</i>	
<i>Total Costs Per Linear Foot – Yrs 2-5</i>							<i>*</i>	<i>1</i>	

[†] Costs are per 1,000 linear feet.

[‡] Detail of material costs located in Table 3. Representative Material Costs.

[¶] May not sum due to rounding.

[§] Includes fuel, lube and repairs.

* Cost is negligible when represented on a linear foot basis.

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Table 3. Detail of Representative Material Costs[†]
Perennial Hedgerow Planting (1,000 Linear Feet) – Central Coast 2003

Material	Quantity/ 1000LF	Unit	Cost/ Unit	Material Cost (\$/1000LF) [¶]	Your Cost (\$/1000LF)
<i>Installation (Year 1):</i>					
Compost	.3	ton	30.00	8	
Water – Irrigation	.75	ac inches	13.40	10	
Perennial Plants – Shrubs	220	shrubs	5.00	1,100	
Drip System Materials	1	system	375.00	375	
Mulch	12	bales	5.00	60	
Fuel, Lube, Repairs				12	
<i>Subtotal</i>				<i>1,565</i>	
<i>Annual Operation & Maintenance (Years 2-5):</i>					
Water – Irrigation	.5	ac inches	13.40	7	
Perennial Plants – Shrubs	18	shrubs	5.00	90	
Traps - Rodents	3	traps	12	36	
<i>Subtotal</i>				<i>133</i>	
<i>Total Material Costs Per Unit (1000LF) – Year 1</i>				<i>1,698</i>	
<i>Total Material Costs Per Unit (1000 LF) Per Year – Yrs 2-5</i>				<i>133</i>	
<i>Total Material Costs Per Linear Foot – Year 1</i>				<i>2</i>	
<i>Total Material Costs Per Linear Foot – Yrs 2-5</i>				<i>*</i>	

[†] Costs are per 1,000 linear feet.

[¶] May not sum due to rounding.

* Cost is negligible when represented on linear foot basis.