

U.C. COOPERATIVE EXTENSION

~ CENTRAL COAST CONSERVATION PRACTICES ~

ESTIMATED COSTS & POTENTIAL BENEFITS FOR A PERENNIAL CRITICAL AREA 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, operation, and maintenance of a critical area planting. Critical area plantings are plantings of annual and/or perennial grasses, as well as perennial trees and shrubs, which are established on farms and ranches in areas upslope of fields that are marginally productive or too steep to farm. Critical area plantings may also be located on steep hillsides next to farm roads. Critical area plantings help stabilize sites that are prone to or actively eroding by increasing water penetration and infiltration, slowing the flow of surface water runoff, and reducing erosion. Ultimately, critical area plantings can contribute to the maintenance and protection of downstream water quality.

Costs for the installation and annual operation and maintenance for the critical area planting 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.

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PRACTICE COSTS

Installation (Planting). The critical area studied here is a one acre site that is moderately sloped, and is prone to erosion and some gully formation. To prepare the site for planting, uneven areas are filled, smoothed, and then disced. Following these operations, weeds on site edges are spot sprayed. Seed is broadcast with a 3-point hitch spinner-spreader, and irrigated up with a temporary sprinkler system. The area is then mulched with straw to retain moisture, assist with germination, and decrease erosion potential. Associated costs are located on Tables 1, 2, and 3.

Costs for site preparation and planting will vary depending on the slope, the amount of damage from erosion, and plants selected. Also, compost and/or other fertilizing materials are sometimes applied to the site during land preparation but are not considered here. If used, practice costs will increase.

Annual Operation & Maintenance. Each year operation and maintenance costs are incurred as a part of this conservation practice. For this study, operation and maintenance costs include mowing and hand weeding the site. In addition, 10% of the area is assumed to be replanted where stand establishment is poor. Associated 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 the critical area planting is 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 critical area plantings, including site planted, slope of land, plant species selected, stand establishment, and number and intensity of storm events each year. Because of the difficulty in valuing both short and long-term benefits, no cost savings is assumed for this study. Potential benefits include reduced surface water runoff and erosion, and the costs associated with the mitigation of associated damage. Critical area plantings can contribute to the protection of downstream water quality by reducing erosion. In addition, preventing or minimizing downstream impacts and/or property damage may reduce conflicts with neighbors and exposure to legal and regulatory actions.

Drawbacks. No revenue-generating land is taken out of production to accommodate the establishment of a critical area planting for this study. Therefore, no loss of revenue is assumed. However, if productive land is used, a loss in revenue must be considered. Farmers may refer to the website <http://coststudies.ucdavis.edu> to view cost of production studies for various crops and to help estimate potential revenue losses. Farmers report some challenges associated with critical area plantings, which include site preparation and equipment use on steep terrain, and poor stand establishment of various plant species. Farmers improve success rates by designing site specific plantings and combining this conservation practice with others such as water/sediment control basins, underground outlets, filter strips, and row arrangement.

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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>.

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Table 1. Perennial Critical Area Planting (Acre) - 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
Site Prep - Fill & Smooth	\$165	\$275	\$330				
Site Prep - Disc	\$31	\$46	\$61				
Spot Spray - Herbicide	\$0	\$9	\$13				
Plant Area	\$64	\$143	\$738				
Irrigate Up	\$75	\$75	\$75				
Mulch - Straw	\$0	\$212	\$280				
<i>(1a) Installation - Subtotal</i>	<i>\$335</i>	<i>\$760</i>	<i>\$1,497</i>				
<i>Annual Operation & Maint. (Years 2-5):</i>							
Mow Vegetation (Machine)	\$0	\$23	\$46				
Hand Weed	\$40	\$80	\$121				
Replant To Improve Stand	\$10	\$18	\$74				
<i>(1b) Ann. Oper. & Maint. Costs - Subtotal</i>	<i>\$50</i>	<i>\$121</i>	<i>\$241</i>				
<i>Interest on Operating Capital @ 7.4%</i>	<i>\$9</i>	<i>\$22</i>	<i>\$42</i>				
<i>(1c) Costs - Subtotal (1a+1b)</i>	<i>\$394</i>	<i>\$903</i>	<i>\$1,780</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>\$394</i>	<i>\$903</i>	<i>\$1,780</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>\$50</i>	<i>\$121</i>	<i>\$241</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 (Acre) YEAR 1 (7-3)					-\$394	-\$903	-\$1,780
NET CHANGE IN INCOME PER UNIT (Acre) PER YEAR - YEARS 2-5 (8-4)					-\$50	-\$121	-\$241

* Unit = Acre.

** Rep = Representative cost.

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

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Table 2. Detail of Representative Installation, Operation & Maintenance Costs[†]
Perennial Critical Area Planting (Acre) – Central Coast 2003

Operation	Non-Mach Labor		Machine Labor		Custom Work		Material Cost (\$/Ac) [‡]	Total Cost (\$/Ac) [¶]	Your Cost (\$/Ac)	
	Hrs/ Ac	Cost/ Ac	Hrs/ Ac	Cost/ Ac	Hrs/ Ac	Cost/ Ac				
<i>Installation (Year 1):</i>										
Site Prep – Fill & Smooth					5	275		275		
Site Prep – Tractor Work/Disc			1.5	31			15 [§]	46		
Spot Spray – Herbicide			.2	4			5	9		
Plant Area – Broadcast Seed			.6	12			131 [§]	143		
Irrigate Up	.6	8	1	21			46 [§]	75		
Mulch – Straw	3	40	1	22			152 [§]	212		
<i>Subtotal</i>		<i>48</i>		<i>89</i>		<i>275</i>	<i>349</i>	<i>760</i>		
<i>Annual Operation & Maint. (Years 2-5):</i>										
Mow Vegetation – Machine			.8	16			7 [§]	23		
Hand Weed	6	80						80		
Replant			.2	4			13 [§]	18		
<i>Subtotal</i>		<i>80</i>		<i>20</i>			<i>20</i>	<i>121</i>		
<i>Interest on Operating Capital @ 7.4%</i>									<i>22</i>	
<i>Total Costs Per Unit (Acre) – Year 1</i>							<i>369</i>	<i>903</i>		
<i>Total Costs Per Unit Per Year (Acre) – Yrs 2-5</i>							<i>20</i>	<i>121</i>		

[†] Costs are per acre.

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

[¶] May not sum due to rounding.

[§] Includes fuel, lube and repairs.

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Table 3. Detail of Representative Material Costs[†]
Perennial Critical Area Planting (Acre) – Central Coast 2003

Material	Quantity/ Ac	Unit	Cost/ Unit	Material Cost (\$/Ac)	Your Cost (\$/Ac)
<i>Installation (Year 1):</i>					
Herbicide – Roundup Ultra	1	pint	4.50	5	
California Native Plant Mix	20	pounds	8.50	127	
Water – Irrigation	3	ac inches	13.40	40	
Mulch - Straw	30	bales	5.00	150	
Fuel, Lube, Repairs				27	
<i>Subtotal</i>				<i>349</i>	
<i>Annual Operation & Maintenance (Years 2-5):</i>					
Replants	2	pounds	8.50	13	
Fuel, Lube, Repairs				7	
<i>Subtotal</i>				<i>20</i>	
<i>Total Material Costs Per Unit (Acre) – Year 1</i>				<i>369</i>	
<i>Total Material Costs Per Unit Per Year (Acre) – Yrs 2-5</i>				<i>20</i>	

[†] Costs are per acre.