

# **U.C. COOPERATIVE EXTENSION**

## **~ CENTRAL COAST CONSERVATION PRACTICES ~**

### **ESTIMATED COSTS & POTENTIAL BENEFITS FOR A ANNUALLY PLANTED GRASSED FILTER STRIP 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 grassed filter strips. Grassed filter strips are areas on-farm that are planted or established to various annual and/or perennial species, and may also include perennial shrubs. They are often located in seasonally wet, low use, or unproductive sites prone to erosion downslope of a production area. Filter strips are established with the goal of improving water penetration and infiltration, slowing surface water runoff, filtering sediment, residual nutrients and/or pesticides, and reducing erosion. These activities can contribute to the protection and maintenance of downstream water quality.

Costs for the annual installation, operation, and maintenance for the grassed filter strips 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

**Annual Installation (Planting), Operation and Maintenance.** This study assumes that growers establish a one-half acre (1,300 linear feet with a 16 foot width) filter strip on gently sloped but smooth ground, downslope of 15 producing acres. To prepare for planting, the area is first disced, and then spot sprayed twice to remove remaining weeds. Barley is then drill seeded, and irrigated up to improve germination and stand establishment. Research indicates that improved stands are established on ground to which barley is not planted back-to-back each year. Therefore, growers may wish to rotate barley with other annual cereals such as oats or rye in alternate years to improve effectiveness in filtering runoff.

After planting the area is mulched with straw to retain moisture, assist with germination, and reduce erosion potential. The site is also flail mowed a total of two times during spring and summer. Associated costs are located on Tables, 1, 2, and 3. If winter rains are timed such that irrigation becomes unnecessary, costs for irrigation would be avoided.

Alternatively, growers may first disc the area, then irrigate to germinate weed seeds, disc again to remove weeds, and then plant barley to remaining moisture. In this case, both the herbicide spray and post-plant irrigation would be substituted with an additional discing and pre-plant irrigation. Also, some growers establish on-farm filter strips by planting perennial species and/or allowing resident vegetation to grow and establish. Shrubs may also be planted as part of a filter strip. Costs will vary accordingly. Permanent plantings may reduce annual planting costs over time.

**Additional Fees & 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 grassed filter strips, no specialized fees or costs are assumed.

## POTENTIAL BENEFITS & DRAWBACKS OF PRACTICE

Farmers, ranchers and landowners should evaluate each conservation practice for potential benefits and drawbacks with respect to their overall operation. This may include risk and any effects on equipment, labor and capital.

**Benefits.** Grassed filter strips are planted to assist with the capture of sediment and residual soil nutrients and pesticides and reduce associated runoff and erosion. Filter strips can reduce erosion of field and ditch banks and reduce sediment accumulation in drainage ditches. Farmers report a savings in labor and equipment use with a decrease in on-farm damage due to reduced surface water runoff, sediment and erosion. These are considered short-term benefits, which, for this study are estimated at \$165. Potential long-term benefits include a reduction in the loss of productive topsoil from the farm. Because of the difficulty in measuring, thus valuing such losses, no cash savings is included in this study. In addition, preventing or minimizing downstream impacts and/or property damage may reduce conflicts with neighbors and exposure to legal and regulatory actions.

**Drawbacks.** Farmers sometimes report taking land out of production to accommodate grassed filter strips. In cases where farmland is taken out of production, a loss in income will occur. Individual growers may refer to the website <http://coststudies.ucdavis.edu> to view cost of production studies for various crops and evaluate potential revenue losses.

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Some growers report an increase in pest problems with grassed filter strips, resident vegetation, and/or filter strips planted to perennial species. Under these conditions, costs for pest management would need to be considered under yearly operation and maintenance. However, filter strips can often be designed and managed, and plant species selected, to minimize damage, thus costs, associated with arthropod and vertebrate pests.

### ACKNOWLEDGEMENTS

Appreciation is expressed to the farmers, ranchers and other organizations and industry representatives who provided information, assistance and expertise for this study. They include: Mary Bianchi, Farm Advisor, UC Cooperative Extension, San Luis Obispo County, Bryan Largay, Hydrologist, Monterey County Resource Conservation District, Marc Los Huertos, Post Doctoral Researcher, Center for Agroecology and Sustainable Food Systems, UC Santa Cruz, and Traci Roberts, Water Quality Program Coordinator, Santa Cruz and Monterey County Farm Bureaus. This study was funded by the United States Department of Agriculture's Natural Resources Conservation Service (NRCS).

### 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. Annually Planted Grassed Filter Strip (.5 Acre) - Partial Budget - Central Coast - 2003

| ESTIMATED COSTS   |             |              |              | POTENTIAL BENEFITS   |              |              |               |
|---|-------------|--------------|--------------|--|--------------|--------------|---------------|
| COSTS PER UNIT*   | LOW         | REP**        | HIGH         | ADDITIONAL RETURNS PER UNIT  | LOW          | REP          | HIGH          |
| <i>Annual Installation, Oper. &amp; Maint.:</i>                       |             |              |              | None   | \$0          | \$0          | \$0           |
| Site Prep - Disc  | \$8         | \$25         | \$33         |  |              |              |               |
| Spot Spray - Herbicide  | \$9         | \$18         | \$25         |  |              |              |               |
| Plant Filter Strip  | \$0         | \$21         | \$216        |  |              |              |               |
| Set Up Sprinklers & Irrigate  | \$0         | \$42         | \$55         |  |              |              |               |
| Mulch - Straw   | \$0         | \$106        | \$175        |  |              |              |               |
| Mow Vegetation (Machine)  | \$8         | \$17         | \$24         |  |              |              |               |
| Hand Weed   | \$0         | \$0          | \$40         |  |              |              |               |
| <i>Ann. Install., Oper. &amp; Maint. - Subtotal</i>                   | \$25        | \$229        | \$568        |  |              |              |               |
| <i>Interest on Operating Capital @ 7.4%</i>                           | \$1         | \$5          | \$12         |  |              |              |               |
| <b><i>(1) Costs - Subtotal</i></b>                                    | <b>\$26</b> | <b>\$234</b> | <b>\$580</b> | <b><i>(4) Additional Returns - Subtotal</i></b>  | <b>\$0</b>   | <b>\$0</b>   | <b>\$0</b>    |
| <b>REDUCED RETURNS PER UNIT</b>                                       | LOW         | REP          | HIGH         | <b>REDUCED COSTS PER UNIT</b>  | LOW          | REP          | HIGH          |
| None (Add Local Values if<br>Income Foregone)                         | \$0         | \$0          | \$0          | Labor & Equip. Use for Prevention &<br>Repairs (Associated with Flood<br>Control & Storm Events) | \$0          | \$165        | \$220         |
| <b><i>(2) Reduced Returns - Subtotal</i></b>                          | <b>\$0</b>  | <b>\$0</b>   | <b>\$0</b>   | <b><i>(5) Reduced Costs - Subtotal</i></b>   | <b>\$0</b>   | <b>\$165</b> | <b>\$220</b>  |
| <b>COSTS &amp; REDUCED RETURNS</b>                                    | LOW         | REP          | HIGH         | <b>ADD. RETURNS &amp; REDUCED COSTS</b>  | LOW          | REP          | HIGH          |
| <b><i>(3) Total Per Unit Per Year (1+2)</i></b>                       | <b>\$26</b> | <b>\$234</b> | <b>\$580</b> | <b><i>(6) Total Per Unit Per Year (4+5)</i></b>  | <b>\$0</b>   | <b>\$165</b> | <b>\$220</b>  |
| <b><i>NET CHANGE IN INCOME PER UNIT (.5 ACRES) PER YEAR (6-3)</i></b> |             |              |              |  | <b>-\$26</b> | <b>-\$69</b> | <b>-\$360</b> |

\* Unit = .5 acres (1,300 linear feet, 16 foot width)

\*\* Rep = Representative cost.

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Table 2. Detail of Representative Installation, Operation & Maintenance Costs<sup>†</sup>  
Annually Planted Grassed Filter Strip (.5 Acres) – Central Coast 2003

| Operation   | Non-Mach Labor   |                   | Machine Labor    |                   | Custom Work      |                   | Material Cost<br>(\$/1,300 LF) <sup>‡</sup> | Total Cost<br>(\$/1,300 LF) <sup>¶</sup> | Your Cost<br>(\$/1,300 LF) |
|---|------------------|-------------------|------------------|-------------------|------------------|-------------------|---|--|----------------------------|
|   | Hrs/<br>1,300 LF | Cost/<br>1,300 LF | Hrs/<br>1,300 LF | Cost/<br>1,300 LF | Hrs/<br>1,300 LF | Cost/<br>1,300 LF |   |  |                            |
| <i>Annual Installation, Operation &amp; Maint.:</i> |                  |                   |                  |                   |                  |                   |   |  |                            |
| Site Prep – Disc                                    |                  |                   | .8               | 16                |                  |                   | 9 <sup>§</sup>                              | 25                                       |                            |
| Spot Spray – Herbicide                              |                  |                   | .4               | 8                 |                  |                   | 10  | 18                                       |                            |
| Plant Filter Strip                                  |                  |                   | .2               | 4                 |                  |                   | 17 <sup>§</sup>                             | 21                                       |                            |
| Set Up Sprinklers & Irrigate                        | 1.0              | 13                | .3               | 6                 |                  |                   | 22 <sup>§</sup>                             | 42                                       |                            |
| Mulch – Straw                                       | 1.5              | 20                | .5               | 11                |                  |                   | 76 <sup>§</sup>                             | 106                                      |                            |
| Mow Vegetation – Machine                            |                  |                   | .6               | 12                |                  |                   | 5 <sup>§</sup>                              | 17                                       |                            |
| <b>Subtotal</b>                                     |                  | <b>33</b>         |                  | <b>57</b>         |                  |                   | <b>139</b>                                  | <b>229</b>                               |                            |
| <i>Interest on Operating Capital @ 7.4%</i>         |                  |                   |                  |                   |                  |                   |   | <b>5</b>                                 |                            |
| <b>Total Costs Per Unit (.5 Acre) Per Year</b>      |                  |                   |                  |                   |                  |                   | <b>139</b>                                  | <b>234</b>                               |                            |

<sup>†</sup> Costs are per .5 acres (1,300 linear feet, 16 foot width).

<sup>‡</sup> Detail of material costs located in Table 3. Representative Material Costs.

<sup>¶</sup> May not sum due to rounding.

<sup>§</sup> Includes fuel, lube and repairs.

Table 3. Detail of Representative Material Costs<sup>†</sup>  
Annually Planted Grassed Filter Strip (.5 Acres) – Central Coast 2003

| Material  | Quantity/<br>1,300 LF | Unit      | Cost/<br>Unit | Material Cost<br>(\$/1,300 LF) | Your Cost<br>(\$/1,300 LF) |
|---|-----------------------|-----------|---------------|--------------------------------|----------------------------|
| <i>Annual Installation, Operation &amp; Maint.:</i>     |                       |           |               |                                |                            |
| Herbicide – Roundup Ultra                               | 2                     | pints     | 4.50          | 9                              |                            |
| Seed – Barley   | 100                   | pounds    | .14           | 14                             |                            |
| Water – Irrigation                                      | 1.5                   | ac inches | 13.40         | 20                             |                            |
| Straw – Mulch   | 15                    | bales     | 5.00          | 75                             |                            |
| Fuel, Lube, Repairs                                     |                       |           |               | 21                             |                            |
| <b>Subtotal</b>   |                       |           |               | <b>139</b>                     |                            |
| <b>Total Material Costs Per Unit (.5 Acre) Per Year</b> |                       |           |               | <b>139</b>                     |                            |

<sup>†</sup> Costs are per .5 acres (1,300 linear feet, 16 foot width).