



# Controlling Erosion on hillside farm roads



*Farm with grass*



*Farm without grass*

For technical advice on underground pipes and other erosion control practices call:

Santa Cruz County Resource Conservation District/Capitola NRCS  
820 Bay Avenue, Suite 107  
Capitola, CA 95010  
(831) 464-2950 OR

Resource Conservation District of Monterey County/Salinas NRCS  
744 LaGuardia Street, Building A  
Salinas, CA 93905  
(831) 424-1036 ext. 3

Other services we provide:

- \*advice & alternatives for runoff management
- \*how and where to use grass and other vegetation
- \*advice & alternatives for erosion control
- \*advice & alternatives for wildlife habitat
- \*advice & alternatives for watershed protection

- Do your roads wash out in the winter?
- Do you lose crops due to sediment washes or slumping at the ends of beds?
- Do your farm ditches fill up with sediment each winter?
- Does the creek downstream from you fill up with sediment each winter?
- Does sediment from your farm cause damage to neighbors?

**If you answered yes to any of these questions, this brochure can help you.**

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*By the Santa Cruz County Resource Conservation District and the  
Resource Conservation District of Monterey County  
in cooperation with  
USDA Natural Resources Conservation Service*

# Why worry about roads?

Roads are one of the most vulnerable areas on the farm for erosion. With a few simple techniques, your roads can be protected.

## The Roads Don't Stand Alone

Look at these key areas of the farm before working on the roads:

### UPHILL:

Look at run off sources from uphill of the farm. Redirect these flows to a sediment basin or to a well protected road.

### NON CROPPED AREAS:

Plant a cover crop or perennial grasses on bare soil.

### LOW SPOTS:

Look at the natural low spots in the field and place roads there. Low spots with lots of water should have a grassed channel next to it.

### FURROWS:

Slow down storm run off by creating long furrow blocks with 1-3% slopes.

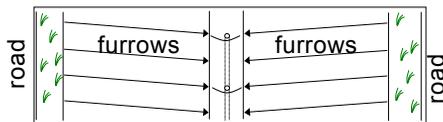
### DOWN HILL:

Slow down concentrated water by planting dense vegetation at the base of the hill or capturing it in a sediment basin.

## Don't Forget the Furrow Blocks

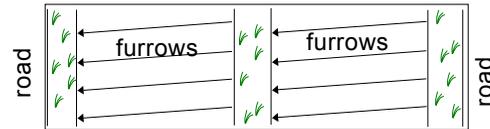
Furrows and plastic mulch on beds concentrate and speed up run off of winter rains. Manage that water before it hits the roads:

### Concentrate & Manage



*For roads with strong protection;  
grass & underground pipe systems.*

### Divide & Conquer



*For roads with minimal protection;  
grass or grass & plastic ditches.*

\*If a road is steeper than 20%,  
run off from the furrow blocks should be  
spread out evenly to less steep roads.



The purpose of this brochure is to provide an introduction to grassed roadways as a tool to manage cropland for optimum productivity and minimal environmental impact. Grassed roadway seeding and road drainage planning are techniques that require practice and experience to master. Modify these methods as needed to best fit the land you farm.

Operating heavy equipment across steep slopes can be dangerous. Know the limits of your equipment. Safety first.

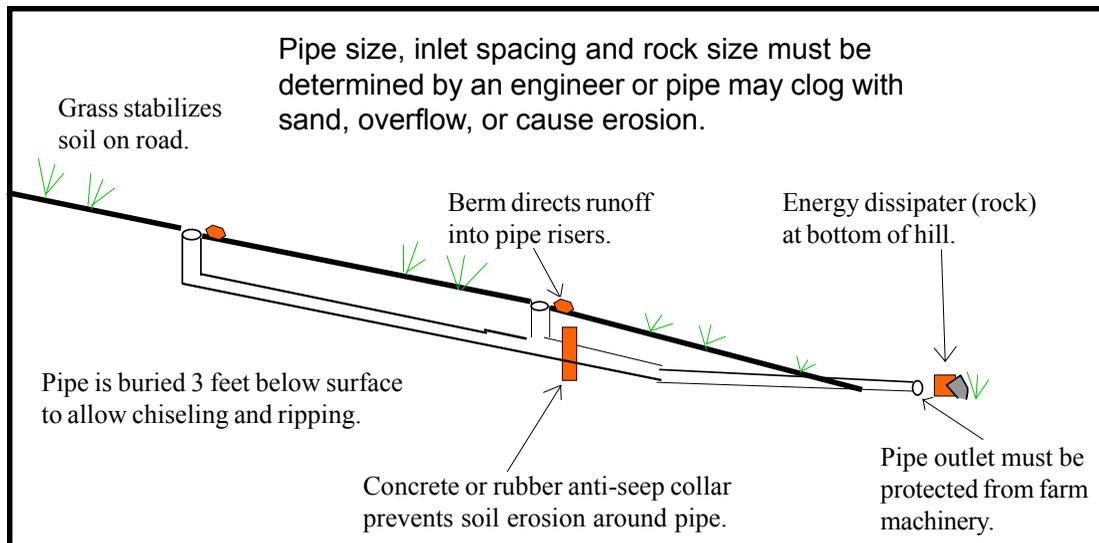
We encourage you to contact your local Resource Conservation District (RCD) or USDA Natural Resources Conservation Service (NRCS) if you would like a hand with grassed roadways. The RCD and NRCS disclaim any damages to property that results from the improper or partial implementation of the techniques presented in this brochure.

## Underground Pipes & Grass for Permanent Erosion Control

### What is the benefit of underground pipes?

Storm water that reaches your farm roads can be directed into an underground pipe and transferred down the slope without taking sediment and crops along with it. The sediment and concentrated water that does wash down the slope are caught in a sediment basin. The water slowly filters out and the sediment is collected so that it can be brought back up the slope the next year. This system is a permanent and highly effective solution. You need to designate critical low roads to be the permanent pipe location and work with an engineer to size pipes and design sediment basin.

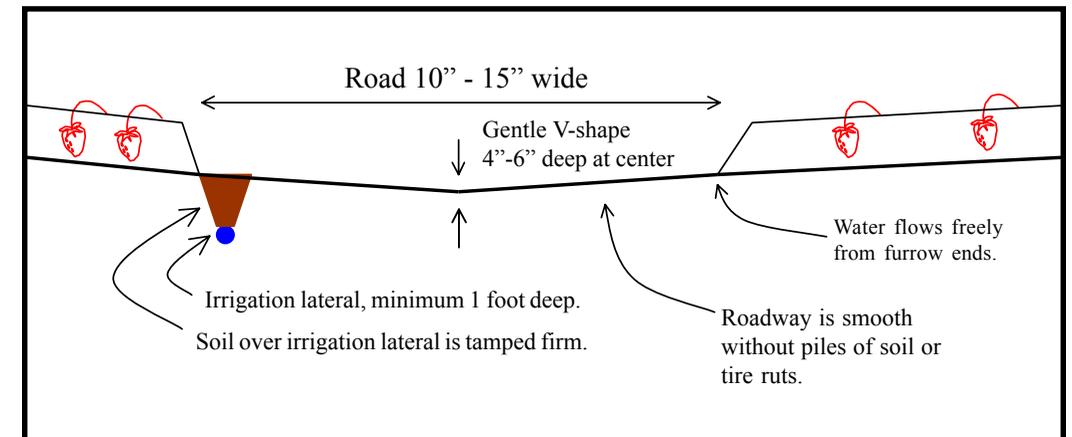
*Warning: Using underground pipe without a sediment basin at the bottom can cause gullies and/or flooding.*



## A Road Shape That Protects Ends of Beds From Erosion

### Methods for shaping a road with a low spot in the center:

1. Cultivate fields and chisel if necessary to increase water infiltration.
2. Cut roads with scraper to form a gentle "V" shape, 6" deep in center.
3. Spread soil in low parts of field.
4. List beds across roads.
5. Cut roads again with scraper to form a gentle "V" shape.
6. Use left over soil to make water bars or shape beds, don't leave it on roads.
7. Roads at edge of farm can be sloped to natural vegetation



*Road Grading: Looking up the road*



*Road shaped with low spot in the center. In this case, due to steep slope, center is lined with plastic. See diagram on page 8.*

## Fall Grass Planting to Minimize Winter Erosion

### Why is grass on winter roads important?

1. Provides a large root mass that protects roads from washing out.
2. Protects bed ends from slumping.
3. Inhibits the growth of weeds.
4. Enhances the water quality of lowland streams.



Rye, fescue, and barley seedlings showing root and plant growth.

## Should I use Annual or Perennial Grasses?

### ANNUAL GRASSES

Suited for non-permanent roads  
Quick to establish in the fall  
Does not need a nurse crop  
Requires little maintenance  
**Short roots**  
**Need to replant every year**  
Protects soil in winter

VS.

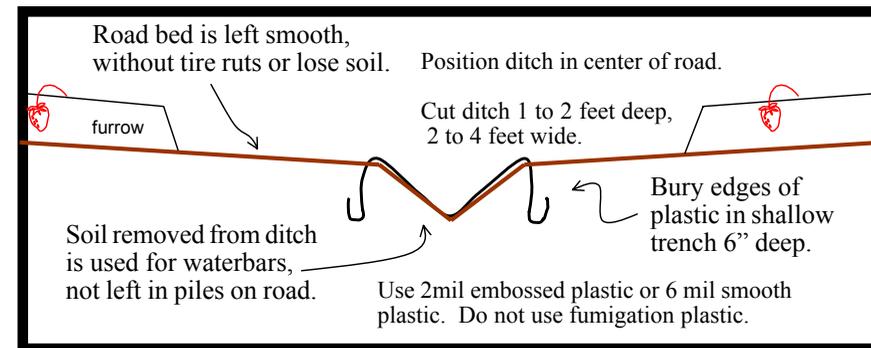
### PERENNIAL GRASSES

Suited for permanent roads & critical areas  
Slow to establish in the fall  
Needs a nurse crop for first year establishment  
Requires weed maintenance for first two years  
**Deep roots**  
**Provides cover & protection through the years**  
Reduces dust in summer/protects soil in winter

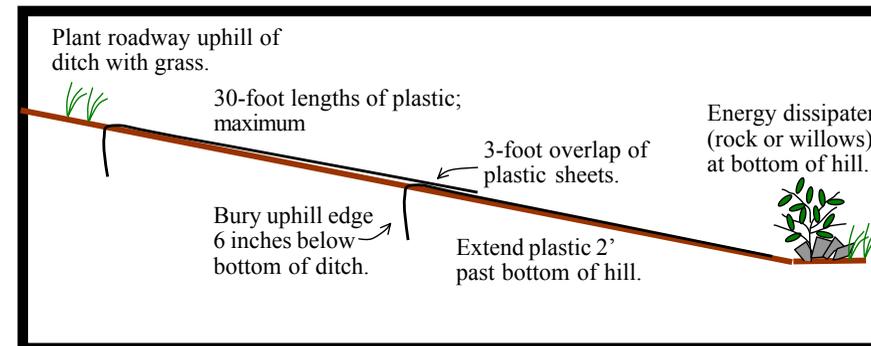
## Plastic Lined Ditches & Grass to Protect Steep Roads From Erosion

### Methods for installing a plastic lined ditch:

1. After roads are cut and smoothed, cut 1' deep x 4' wide ditch in center of the road.
2. Lay out 2 mil embossed plastic or 6 mil smooth plastic for maximum strength. Both can withstand a dog stepping on them without tearing. **Don't reuse fumigation plastic.**
3. Start at the bottom of the hill and work your way up.
4. When you start the second sheet of plastic, make sure it overlaps the first sheet by about 3 feet.
5. Dig a small trench (6" deep) along the outer edge of plastic. Tuck edges into the trench and bury.
6. Plant grass on road above and on the sides of the ditch and 10' into the furrows.
7. Use rocks or willows at the bottom of the slope to minimize damage from water flow.



Plastic Lined Ditch: Looking up the road. See photo on page 2.



Plastic Lined Ditch: Side View

# Can Grass and Road Shaping Alone Hold Your Road Together?

Look at the tables below to find the maximum number of farmed acres that can be safely drained with grass alone to stop road erosion.

## Maximum number of acres that grassed roads can handle:

Do you use full bed plastic mulch from November through February? Established Annual or Established Perennial grass?			
Full Bed Plastic, Annual Grass (such as barley)		Full Bed Plastic, Perennial Grass (such as creeping wild rye)	
Road Slope	Acres	Road Slope	Acres
4%	2 1/2	4%	5
8%	1	8%	2
16%	1/3	16%	2/3
24%	1/4	24%	1/2

Do you <b>NOT</b> use full bed plastic mulch from November through February? Established Annual or Established Perennial grass?			
No Plastic, Annual Grass (such as barley)		No Plastic, Perennial Grass (such as creeping wild rye)	
Road Slope	Acres	Road Slope	Acres
4%	6 1/2	4%	13
8%	2 1/2	8%	5
16%	3/4	16%	1 1/2
24%	1/2	24%	1

Tip: Use these tables as a guide to planting grass on the top portion of the road that can drain safely and then begin the ditch or pipeline part way down your road with grass. If you think that there is a large amount of water that comes from non-cropped areas, you will be safer to extend the ditch or pipe all the way up the road.

# Methods for grass road seeding

1. Plant grasses as soon as roads are cut and irrigate if necessary.
2. If soil on road is compacted, lightly aerate the soil with a disk, chisel or a rake. (Passing over the soil with a ring shank roller prepares an excellent seed bed.)
3. Broadcast seed over the road by hand or with a seed broadcaster. If you were to throw a baseball cap over the seeds, you should see ten seeds below the hat (see chart for detailed application rates on page 5).
4. Seed more heavily around ends of beds and seed 10 feet into each furrow.
5. Lightly bury seed about 1/2 inch deep in soil by passing over it with a disk or rake.
6. Cover the seed with straw mulch to protect it and retain moisture.
7. Provide supplemental irrigation if planted before rains.
8. Mow grass before seeds set.



Scraper



Completely seeded road with straw mulch.



Ring shank roller



Seeding

## Suggested Grasses, Seeding Rates, and Timing

Seed Varieties	Life Cycle & Planting Time	Grass Characteristics	Lbs. of seed per 100 ft. by 10 ft. of roadway	Lbs. of seed per acre	Estimated cost per acre for seed
*Cereal Rye "Merced" Variety <i>Secale cereal</i> *Don't confuse cereal rye with annual rye <i>Lolium multiflorum</i> which is an invasive weed	Annual early season Sept. - Nov.	Good on dry, sandy slopes, excellent roots	2 lbs.	80 lbs./acre	\$24/acre
Common Barley "UC 603" Variety <i>Hordeum vulgare</i>	Annual late season Nov. & Dec. or for emergencies	Good on all soils, fair roots	4.5 lbs.	180 lbs./acre	\$23/acre
Trios "102"	Annual early season Sept. - Nov.	Good on all soils, good roots & low growth pattern	1.5 lbs.	60 lbs./acre	\$25/acre
California Brome <i>Bromus carinatus</i> (nurse crop, fast germ. rate, short lived - 3 yrs.) & Creeping wild rye <i>Leymus triticoides</i> (long lived 100 years, slow germ. rate)	Perennial Native Mix early season Sept. & Oct.	Good on dry, sandy slopes, good roots & Good on dry sandy slopes, and loam/clay soils, excellent roots	.3 lbs. & 1 lb.	12 lbs./acre & 12 lbs./acre	\$180/acre & \$240/acre

## Where to Buy Erosion Control Seeds

Central Coast Wilds  
114 Liberty Street, Santa Cruz  
(831) 459-0656

L.A. Hearne  
8525 Prunedale N. Road, Prunedale  
(831) 663-1572

Elkhorn Native Plant Nursery  
P.O. Box 270, Moss Landing  
(831) 763-1207

Native Revival Nursery  
8022 Soquel Drive, Aptos  
(831) 684-1811

General Feed & Seed  
1900 Commercial, Santa Cruz  
(831) 476-5344

Rana Creek Ranch  
35351 Carmel Valley Road, Carmel  
(831) 659-4851

John Snow Seed Company  
21855 Rosehart Way, Salinas  
(831) 758-9869

## Where to Buy Rice Straw

AGCO Incorporated  
Hollister, CA  
(831) 628-3564

General Feed & Seed  
1900 Commercial, Santa Cruz  
(831) 476-5344  
(minimum purchase - 250 bales of rice straw)

L.A. Herne  
8525 Prunedale N. Rd.  
(831) 663-1572



*Note: We recommend rice straw because it is less weedy on uphill farms.*