

Rubber Water Diverters May Minimize Pasture and Rangeland Road Erosion

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A demonstration project funded by a Montana Grazing Lands Conservation Initiative grant show promise for erosion control on pasture and rangeland roads. The project is designed to consider alternatives for the control and management of road erosion. Traditional efforts to stop erosion have not proven consistently effective. This project employed rubber water diverters made from used conveyor belts, mounted on 2x4 boards that lined 12-inch-deep trenches.



Preliminary indications are this method may be less expensive and more effective in maintaining roadways than traditional "water bars" (earthen berms).

Project Specifics

Roads that provide access to rangelands, tame pastures, hay fields and crop land in Eastern Montana often wash away. These roadways not only become degraded and are subject to severe soil erosion they are also notorious for providing weed proliferation opportunities. Weeds by definition are plants growing where they are not wanted. Degradation of roads can also damage equipment and vehicles and create unnecessary risks. Maintaining those roads on a regular basis are often costly, both in cost of fuel and manpower.

The Custer County Conservation District, with NRCS assistance is conducting two tests, funded by a grant from the Montana Grazing Lands Conservation Initiative to determine the viability of the use of rubber water diverters along these roadways. Two local landowners provided the sites for the project. The photographs illustrate the "before", "during" and "after" installation of this project.



Gullies reached depths of 18 inches.

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First Project

In the first test, the "before" photo illustrates the annual erosion of 1000 feet of roadway with erosion so bad 18-inch gullies were created by the run-off. In most cases (as was demonstrated in this project area), the road bed lowers, often below the height of surrounding land causing the water to collect and flow down the roadway itself.

For the project, a road grader reshaped the road to a 1.5% slope. A hand-operated trencher was used to create a trench, 12 inches deep at an angle 11 degrees off perpendicular.

Then, used conveyer belting was cut to a width of 15 inches and a length of 16 feet. The belting was mounted on a 2x4, treated bed board, which was placed in the trench, then backfilled with compaction at about 4-inch lifts.

One thousand feet of road was treated with a cost estimated at \$1.10 per linear foot. For the first year, no maintenance was required for the test road. There was minor cleaning required above several of the diverter strips.



Used conveyor belting 15 inches wide and 16 feet long is mounted to a bedding board (treated 16-foot 2x4).



A hand-operated trencher was used for diverter installation.



The diverter is attached to the bedding board in the trench prior to backfilling and packing.



The rubber water diverters were installed so that 1-1/2 to 2 inches of rubber stuck out of the ground.



Rubber water diverter is installed and tamped. Diverters were installed at 11 degrees off perpendicular.



Road was shaped and diverters installed.

| Expenditures - Grant \$ | In-Kind Contributions - Value | Total |
|-------------------------|-------------------------------|--------------|
| belting | road grader | \$280 |
| 2x4x16 | labor 4 people | \$250 |
| screws & washers | grass seed | \$25 |
| trencher | | |
| fuel | | |
| admin fee | | |
| total expenditures | total in-kind | \$555 \$1099 |

Feet of road treated = 1000. Total cost per foot = \$1.10.

A second stretch of roadway has been treated and is being evaluated.



Water diverters have been installed at the upper end of the second site (Anderson site).



Rubber water diverters were also installed at the lower end of the second site.

| Expenditures - Grant \$ | In-Kind Contributions - Value | Total |
|-------------------------|-------------------------------|---------------------|
| belting | road grader | \$350 |
| 2x4x16 | dozer | \$2275 |
| screws & washers | tractor/ripper | \$160 |
| trencher | tractor/blade | \$600 |
| fuel | loader | \$320 |
| | dump truck | \$240 |
| | crow's-foot packer | \$150 |
| | labor 6 people | \$1375 |
| | grass seed | \$25 |
| | fuel | \$660 |
| | admin fee | \$48 |
| total expenditures | total in-kind | \$960 \$6203 \$7163 |

Feet of road treated = 3000. Total cost per foot = \$2.39.

