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Using Sod On Highways

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We build curbs and gutters for our city streets and use eaves troughs and spouting on our houses to dispose of runoff water. But what about the road ditches on our highways?

On the primary and secondary road systems of Iowa there usually are large investments per mile of constructed road. It is here that the use of grass sod, in addition to other vegetative practices (Farm Science Reporter, April 1945), can immediately protect those areas over which runoff water flows.

Proper sodding of intercepting and roadside ditches prevents gullying and undercutting and sliding of slopes. Failure to build sod channels often results in roadside areas becoming isolated as gullies develop, thus making mowing and other maintenance operations impossible. This also increases the hazards to traffic as the gullies encroach on the roadway. Adjacent farm land also suffers as back-slopes erode and fences wash out. Often sod structures are much better in carrying water than mechanical structures, and the sod structures cost less.

Where to Use Sod

The soil type, soil fertility and the amount of runoff all help determine whether one needs to sod or whether the ditch can be seeded. When the fertility is high it is possible to obtain a good stand of vegetation in some road ditches by sowing seed, provided rainfall is not excessive while the stand is becoming established. But the chances of grasses becoming established by seeding before a severe rain occurs are slim. Therefore we recommend sodding these areas in the first place. Generally all ditches on a 3 percent grade or steeper should be sodded. There are cases where, because of soil type, sod will be needed on even flatter grades than 3 percent.

We have found that where farm lands slope toward the highway and contribute runoff from fields, intercepting ditches should be constructed as shown in fig. 1 and the channel of the ditch sodded to prevent cutting and gullying. There will be instances when water from adjacent farm fields must reach the roadside sodded channel over the backslope of the cut. Sod flumes play an important part in the disposal of this runoff water, as shown in fig. 2.

Another important use for grass sod in highway construction is to protect mechanical structures, including wing walls of bridges, culverts and concrete flumes, and provide sod collars for concrete and steel entrance pipes. The use of sod in this manner helps materially in tying the mechanical structure into the roadbed and furnishes much needed protection to prevent side cutting and the undermining of structures.

Shaping Ditch and Flume

In general, the roadside ditch and flume areas to be sodded can be roughed out mechanically with such equipment as a tractor and plow, grader or bulldozer. In the future probably specially designed equipment will be available for shaping ditches before sodding.

We have found the flat-bottom channel, ranging in width from 4 to 12 feet, depending upon the topography and area of the watershed concerned, is very satisfactory. The finished sod channel should have a 6-inch minimum depth. With the use of flat-bottom sodded channels the runoff water is spread out and has less depth and flows more slowly than a V-shape or rounded bottom channel.

How to Use Sod

The sod usually is cut from a good clean bluegrass or bromegrass pasture. The strips are cut to a uniform width and thickness of 1 to 1½ inches throughout for bluegrass and somewhat thicker for bromegrass. The sod strips should be not less than 36 inches...
The above workman is placing sod in a newly graded and shaped roadside ditch. The sod furnishes immediate channel protection from runoff. During the establishment, the sod should never be allowed to get dried out. Immediately after laying, the sod and sodbed should be thoroughly soaked to facilitate tamping which brings the sod in close contact with the sodbed. This eliminates voids beneath the sod and retards moisture losses.

In length. The strips are laid crosswise of the channel. In general, not more than 18 hours should elapse between the cutting and the laying of the sod. Be careful to prevent the sod from drying.

Prior to laying sod, the soil in the channel and flume-bottom areas should be loosened to a depth of 1 inch and thoroughly dampened if it is not already moist. A commercial fertilizer, preferably a 10-6-4, should be applied at the rate of 10 pounds per 1,000 square feet and worked well into the sodbed. The sod strips should be packed tightly together so that no open joints are left between strips. We have found it important in constructing sodded channels to extend every tenth strip about 3 feet beyond the edge of the channel. These “wings” encourage water to enter the sod channel and prevent cutting and gullying along the sides.

We have found that it is well to tamp the sod and stake the sodded waterways with 12-inch pointed lath. This helps to prevent the loss of newly laid sod as a result of excessive runoff caused by heavy rains. The stakes can be spaced approximately 30 inches apart and driven at an angle against the direction of the water flow until they extend ½ inch above the top of the sod. Not more than one hour should elapse between laying and watering the sod. You should thoroughly soak the sod and sodbed at least 1 inch deep. All sod should be kept moist until it is well established.

If sod channels are to be installed in wide ditches or borrow-pits, be sure the channels are placed at the low point of the ditch. The earth areas adjacent to all sodded channels and flumes should be mulched 5 feet wide to prevent washing of silt onto the sod.

Time to Sod

Inasmuch as sodding is a part of the vegetative program, which includes sowing of grasses and legumes and stabilizing crops and mulching, it is best to do sodding on new construction in early spring (late March through May 30) and late summer (August 15 to October 1). It is possible, however, to do sodding throughout the summer and somewhat later in the fall, provided the sod is kept moist until it becomes rooted and established. The watering of sod needs to be done for approximately 30 days if there isn’t sufficient rainfall.

There will be times through the year when new construction will lay unprotected because the season is not right for establishing vegetation. Such construction usually is revegetated at the earli-
est possible date when grasses and legumes can be established.

Kind of Sod

Over most of Iowa we have used bluegrass sod with good results for the sodding of channels, roadside ditches and sod-flume work. However, in the western tier of Iowa counties, where bluegrass is not very well adapted, such sod as bromegrass or bromegrass-blue-stem wheatgrass mixtures should be used on the well drained areas for flume and channel construction.

We have found reed canarygrass, because of its vigorous, spreading root system and its ability to withstand considerable moisture, valuable for the poorly drained areas. It's a good plan to establish reed canarygrass areas of 1/10 to 1 acre in size as a local source of root and sod material. The sod can be used on new construction as well as in maintaining old construction.

All sod material used should be free of noxious and secondary noxious weeds and should be taken from good, solid, thick-growing stands.

Vegetation Maintenance

During the first year where grasses and legumes are seeded in the spring the roadside areas should be mowed periodically to control weeds. In general, the early fall seeded grasses on the more fertile soils will form good cover the following spring and summer. These areas should be observed frequently, however, and clipped when necessary to control weeds. If the growth of the stabilizing crop is heavy and vigorous, mowing will be very beneficial to prevent it from dominating the young grasses and legumes.

The well established grasses and legumes will benefit from several mowings during the year. It is important that the channel and flume areas be mowed frequently enough to prevent heavy top growth from developing and thinning the sod which would result in damage from heavy runoff. A dense sod is needed in these areas to insure carrying runoff from heavy rains.

The roadside right-of-way area should be observed closely the first year while grasses and legumes are becoming established. It may be necessary to reseed and re-mulch small areas as well as make repairs on sodded structures. Here the old adage, “A stitch in time saves nine,” is very applicable.

In those areas where vigorous, fast-growing annual weeds are prevalent, it is important that adapted vegetation be established in order to help control annual weeds.
Adapted grasses and legumes are very efficient in controlling most annual weeds and retarding spread of perennial weeds along roadsides. Here is a good vigorous stand of bromegrass along a secondary road adjacent to the Chris H. Jensen farm in Audubon County. The county supervisors cooperated with Jensen in making a mowable slope.

We have found that regrading cannot take the place of vegetative techniques. We must “fasten” this soil down with crop roots before it has washed away, thereby eliminating the cost of regrading.

A good vigorous growth of adapted grasses and legumes is most efficient in controlling annual weeds. Grasses also form the basis of a slightly appearance of the roadside right-of-way. The proper use of grass sod and root material furnishes much protection to mechanical structures by tying them into the earth part of the road.

A well stabilized right-of-way area, with adapted grasses and legumes and sodded structures, together with adequate conservation practices on the contributing watershed areas of the adjoining farm lands, will practically eliminate gullying of roadside ditches and slopes and the cleaning out of culverts and other similar structures.

It probably will be found most practical on the secondary road system to start the intensive job of revegetation on the new highway construction and expand it to present roads as reconstruction work is undertaken.

We feel that with proper county-farmer cooperation, a great saving can be made to the counties and to the farmers where adequate vegetative practices are made a part of the road building program. With the proper use of vegetation, grading costs can be reduced, gullying prevented, more efficient weed control measures used, and a more sightly roadway developed, of which the community can be proud.

Sodding around highway structures such as this prevents erosion and securely ties them into the soil.