NRCS Natural Resources Conservation Service
Minnesota

Critical Area Planting (342)

Agronomy Job Sheet **February 2007**

What is Critical Area Planting

Critical Area Planting is establishing permanent vegetation on sites that have or are expected to have high erosion rates, and on sites that have physical, chemical or biological conditions that prevent the establishment of vegetation with normal planting practices.

Purpose

This practice is applied as part of a conservation management system to stabilize erodible soil surface areas with high rates of soil erosion by water or wind, restore degraded sites that can not be stabilized through normal methods and reduce damage from sediment and runoff to downstream areas.

Where the practice applies

This practice applies to highly erodible or critically eroding areas. These areas usually cannot be stabilized by ordinary conservation treatment and/or management, and if left untreated could cause severe erosion or sediment damage. Examples include small concentrated flow areas, waterways, dams, cuts, fills, surface mined areas and denuded or gullied areas where vegetation is difficult to establish by usual planting methods.

Criteria

Species selection for seeding or planting shall be based on current site conditions, including climate conditions, soil characteristics, aspect, exposure to sunlight, slope, drainage, presence of concentrated flow areas, proximity to natural plant communities, plant characteristics such as season of growth, vigor, disease resistance, ease of establishment, longevity of the species, adoption to soil conditions, and growth habit and conservation value.

Considerations

Species or mixes that are adapted to the site and have multiple values should be considered. On low maintenance sites, species or mixes that are native to the region and have multiple values should be used for improved wildlife habitat and aesthetics.

Avoid species that are on the state invasive species list or plants that have a known potential to move off the site.

Avoid species that may harbor pests. Species diversity should be considered to avoid loss of function due to species specific pests.

For waterways and areas of concentrated flow, seeding across the direction of water flow is preferred to seeding up and down the waterway with the direction of flow.

Hydroseeding is recommended on slopes too steep for normal field equipment or where the use of normal field equipment is not feasible.

Fertilizer spreaders may be used to broadcast seed along with the lime and fertilizer requirements. Inert materials such as cracked corn may be used as bulk material to aid in seed dispersal.

Allelopathy effects have been documented with certain cereal grains used as temporary cover. These crops produce chemical substances that inhibit the growth or establishment of following grasses. Light tillage is often used to reduce allelopathy prior to seeding permanent cover.

Top Soiling

On sites where exposed and underlying soil will not support vegetation, apply a minimum of 4 – 6 inches of topsoil as a part of construction. The surface of areas to be topsoiled shall be loosened to a depth of 2 inches. The topsoil shall be mixed within this depth to insure bonding of the topsoil and subsoil. Compact

the topsoil enough to insure good contact with underlying soil but not so much that it will deter seed germination or prevent proper anchoring of mulch. Smooth topsoil to allow seedbed preparation.

Site Preparation

Shape to final design grade, including installation of all measures to provide surface and subsurface drainage (such as tile lines) and needed erosion control practices (such as outlet structures). Grade to a stable slope when shaping to permit use of conventional equipment for seedbed preparation, fertilizer application, seeding, mulch application and anchoring. For slopes steeper than 2:1 special practices may be required. Eliminate all overfalls. The toe of the slope or the outlet of the concentrated flow channel shall be stable before seeding.

Seedbed Preparation

After site preparation is completed, work the seedbed to a minimum depth of 4 inches with a disc, field cultivator or chisel plow to loosen compacted layers, incorporate fertilizer and permit root penetration. On areas too steep for equipment to operate, scarify by hand.

After working the seedbed, harrow or pack it prior to seeding to break up large clods and firm the seedbed. The prepared seedbed must be soft enough to permit covering the seed and anchoring mulch, yet firm enough to prevent burying seeds too deep. For example, the soil should be firm enough to support the weight of a person without sinking into the soil more than ½ inch.

Method of Seeding

Drilling: Grasses should be drilled uniformly over the area at a depth of ¼ to ½ inch using a grassland drill, grain drill or cultipacker seeder that can control seeding depth and has press wheels to pack the soil in each drill row.

Broadcasting: Seed shall be uniformly distributed by a mechanical or hand operated seeder. Cover the seed by cultipacking, harrowing or hand raking.

Hydroseeding: Apply the seed uniformly over the site. Hydroseeders shall provide continuous agitation and be capable of supplying a continuous, non-fluctuating flow of slurry.

Dormant seeding: After construction, wait until November 1. Then prepare the seedbed, sow the seed, apply and anchor the mulch the same as during other seeding periods. An alternate method of dormant seeding is to prepare the seedbed and apply and anchor the mulch immediately after construction. After November 1, sow the seed over the mulch. Seeding rates must be doubled when using this method.

Seeding Mixture

See Table 1: Seeding Mixtures for Permanent Seedings in the practice standard to select appropriate mixtures for the intended purpose.

Lime and Fertilizer

Recommendations will be determined by use of a soil test. If no soil test is available, apply the following amounts of fertilizer:

80 lbs / acre of N – P_2O_5 – K_2O (1.8 lbs/ 1000 ft^2)

Apply lime as needed to adjust soil pH to 6.0 for grass species.

Incorporate lime and fertilizer during seedbed preparation.
For mixtures with warm season plant species, fertilizer and lime are not recommended.

Date of Seeding

Seeding should be done immediately after construction when construction occurs between April 1 and September 1 (north) or September 10th (south).

No seedings will be done from September 1 (north) or 10 (south) to November 1. After November 1, a dormant seeding may be done. Projects constructed after Sept. 1 (north) or September 10 (south) may be mulched and dormant seeded or mulched and seeded the following spring.

If the project is completed between June 1 and August 1 (south) or June 15 and July 15 (north), it is strongly recommended to wait until July 15 (north or August 1 (south) to do the seedbed preparation and seeding. If this is not possible, seeding can be done between June 1 and August 1 (south) or June 15 to July 15 (north); however these seedings will have a greater chance of failure.

Companion Crops

Small grain companion crops shall be used on all critical area seedings when the area is not mulched.

For mixtures of cool season grasses, use barley, oats or spring wheat at ¾ to 1 ¼ bushels per acre with spring, fall, or dormant seedings. Winter wheat or rye can be used with spring seeding only at ½ to ¾ bushels per acre. Clip companion crops in the boot stage unless the area is too steep for equipment to operate.

Annual rye grass may be used as a companion crop during all seeding periods at the rate of 3 pounds per acre. It does not have to be clipped.

Mulching

Mulching is required with all dormant seedings, when fill heights are greater than 10 feet in vertical height and/or longer than 30 feet and in designed channels to carry concentrated flows where velocity exceeds 2.5 f.p.s. The benefits of mulching are considered for each site and may be required in other situations. Mulching will be completed as soon as possible after seeding, or if seeding is delayed, as soon as construction is completed. Grass hay or cereal grain straw is the most common mulching material used. Use 70 – 100 lbs. (2 bales) per 1000 sq. ft. (90 – 100 bales per acre).

Use enough material to lightly cover 75-90% of the surface. The mulch should be uniformly spread without dense clumps or bare areas. Anchor using a disc with serrated straight disks or similar equipment so the mulch material does not blow or wash away. The anchoring disc should crimp and push the straw mulch into the soil, creating an effect similar to grain stubble. It should not cut the straw into smaller pieces.

Shredded or chopped corn stalks may also be used at a rate of 185 – 275 lbs. per 1000 sq.ft. or 4 – 6 tons per acre. Anchoring is not required but may be desirable.

Organic fiber blankets and mats are effective for erosion control on steep slopes and areas of concentrated flow. Use according to manufacturers directions.

Temporary Cover

Completed sites where permanent seeding will not be done for 60 days or longer will be seeded to a temporary cover crop. For shorter periods of time, the need for temporary cover will be determined by site conditions. See practice standard for a list of temporary cover crops and the seeding rate.

The residue from this crop may either be incorporated into the soil during seedbed preparation for the permanent seeding, or left on the surface if the permanent cover is planted with a no till drill.

Operation and Maintenance

Protect new seedings from grazing, fire and traffic until well established

Control undesirable broadleaf weeds and weedy grasses as needed. Use clipping or herbicides. Inspect annually and make any needed repairs.

Reseed eroded areas promptly.

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Critical Area Planting – Job Sheet

Landowner_____Field number_____Practice_____

Purpose (check all that apply)	
☐ Stabilize areas with existing or expected high rates of water erosion	☐ Improve wildlife habitat and visual resources
☐ Stabilize areas with existing or expected high rates of wind erosion	☐
☐ Restore degraded sites	☐
☐ Reduce damage from sediment to downstream sites	☐ t
☐ Reduce damage from runoff to downstream sites	☐

Temporary Cover

Species	Rate/Acre	Acres to be seeded	Total seed needed

Seeding Mixture

Grass	Lbs/Acre	Acres to be seeded	Total pounds needed

Lime and Fertilizer

	Lbs / Acre	Acres	Total pounds needed
Lime			
Nitrogen			
P2O5			
K2O			

Additional Specifications and Notes:

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