

SPECIFICATION

Critical Area Planting – 342

Critical Area Planting shall be planned and applied in accordance with the North Dakota Standard detailed in the Field Office Technical Guide (FOTG) – Section IV – Conservation Practices. This document provides conservation planners with additional parameters, recommendations, references, and requirements for developing site-specific plans for this practice.

SITE EVALUATION AND PREPARATION

Evaluate the soil and related resources to determine their limitations and potentials for establishing adequate vegetative cover. Determine if there is a need to save, segregate or haul in soil material that will support vegetative growth. Twelve (12) or more inches of soil material capable of supporting plant growth should be placed over any toxic, sterile, or impervious layer. Unless roots can reach a water table, the growth layer of soil material should be capable of storing two (2) or more inches of moisture. Consider the need to divert runoff from the area during establishment.

Grading, Shaping, and Filling

1. Steep areas where final slopes will be one (1) foot vertical to four (4) feet horizontal or steeper will have berms, gradient terraces or diversions installed to break slope length to about 75 feet or less.
2. Steep edges of sand blowouts will be shaped to one (1) foot vertical to five (5) feet horizontal, or flatter.
3. Determine other grading, shaping and filling operations needed to establish required conservation practices and sustain the planned use of the area. Where practical, grade to permit use of conventional equipment for seedbed preparation, seeding, and mulching.
4. Topsoil from the critical borrow areas will be saved and re-spread on areas as directed by the NRCS representative. Before topsoil is replaced, the re-graded land shall be scarified or otherwise treated to eliminate slippage surfaces and to promote root penetration.
5. Borrow areas outside the critical area are to be reclaimed to their former use and potential as directed by the NRCS representative.
6. All major filling operations will be carried out in successive layers not exceeding one (1) foot in depth. Final cover on such areas will be placed in one or more layers not exceeding six (6) inches in depth.
7. Trees, brush, or other debris that will interfere with establishment of vegetative cover will be removed or buried two (2) or more feet below the surface and away from concentrated flow areas.

HERBACEOUS PLANTINGS

1. Follow recommendations in Herbaceous Vegetation Establishment Guide (FOTG - Section I - Reference Subjects) Seeding dates (Part 1)

- Seedbed preparation (Part 2); also see Item # 3 and Item # 4 of this document section.
- Seeding equipment (Part 3)
- Drill calibration (Part 4)
- Seed requirements (Part 5); also see Item # 2 of this document.
- Seeding depth (Part 6)
- Management and protection during establishment (Part 8)
- Guidelines for stand evaluation (Part 9)

2. Selecting species and varieties

- Native species should be selected, especially within or adjacent to native plant communities. Reed canarygrass and creeping foxtail will not be used due to their tendency to form monocultures.
- Species selected shall be compatible with site conditions, soil type and when possible, management in accordance with the species-soil compatibility tables in the Herbaceous Vegetation Establishment Guide or Table A, Adapted Species Guide, below.
- The seeding rate for this practice, either drilled or broadcast, shall be 150% of a full rate based on the Herbaceous Vegetation Establishment Guide, Table 1.
- The planting mixture shall include at least two sod-forming grass or sedge species, unless soil problems (i.e. strongly saline) preclude such a mixture.
- Sod-forming species shall constitute at least 50% of the mixture, unless soil problems such as strongly saline soils preclude such a mixture.
- Forbs and legumes may comprise no more than 20% of the mixture.
- Obtain prior approval from the State Plant Materials Specialist for planting rates involving sod plugs or rhizomes.

Table A. Adapted Species Guide

Species ²	Site Adaptation ¹					
	Sandy	Loamy	Clayey	Imperfectly Drained ³	Poorly Drained ⁴	Saline Affected ^{5,6}
Native Sod Formers						
Western wheatgrass (PASM)	F	G	G	G	F	G
Prairie cordgrass (SPPE)	G	G	G	G	G	F (wet)
Switchgrass (PAVI)	F	G	F	G	-	F
Big bluestem (ANGE)	F	G	F	G	F	-
Prairie sandreed (CALO)	G	G	-	-	-	-
Sand bluestem (ANHA)	G	F	-	F	-	-
Thickspike/Streambank wheatgrass (ELLAL)	G	G	F	-	-	F
Buffalograss (BODA2)	-	-	-	-	-	F
Inland saltgrass (DISP)	-	-	-	-	-	G
Beardless wildrye (LETR5)	-	-	-	-	-	G
Native Bunchgrass						
Canada wildrye (ELCA4)	G	F	-	F	-	F
Blue grama (BOGR2)	F	G	G	-	-	-
Green needlegrass (NAVI4)	G	G	G	F	-	-
Little bluestem (SCSC)	G	G	F	F	-	-
Sideoats grama (BOCU)	F	G	F	F	-	-
Slender/Bearded wheatgrass (ELTR7)	F	F	F	F	-	G
Sedges						
Fox sedge (CAVU2)	-	-	-	F	G	-
Slough sedge (CAAT2)	-	-	-	-	G	-
Introduced Sod Former						
Intermediate/Pubescent wheatgrass (THIN6)	F	G	F	F	-	-
Mammoth wildrye (LERA5)	F	G	G	-	-	-
Manystem wildrye (LEMU11)	-	-	-	-	-	G
Introduced Bunchgrass						
Tall wheatgrass (THPO7)	F	G	G	G	F	G
Altai wildrye (LEAN3)	F	G	G	-	-	G
Dahurian wildrye (ELDA3)	F	G	G	F	F	-
Russian wildrye (PSJU3)	F	G	G	-	-	G
Hard fescue (FEBR7)	F	G	G	-	-	-
Crested wheatgrass (AGCR)	F	G	G	-	-	F
Meadow brome grass (BRBI2)	F	G	G	-	-	-
Green wheatgrass (ELHO3) ⁷	F	G	G	F	-	G
Forbs/Shrubs						

For Forbs and Shrubs, Refer to Herbaceous Vegetation Establishment Guide and/or *Plant Materials for Salt-Affected Sites in the Northern Great Plains*. http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/ndpmctn7094.pdf

¹ Legend: G = Good, F = Fair, - = Unsuitable.

² See Herbaceous Vegetation Establishment Guide for more information

³ Moderately well to somewhat poorly drained soils.

⁴ Poorly drained soils.

⁵ Includes soils listed as "Not Suited" Forage Suitability Group due to high salinity or that have increased salinity levels based upon field measurements (EC 15 - 25)

⁶ See *Plant Materials for Salt-Affected Sites in the Northern Great Plains* for more information on saline affected sites. http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/ndpmctn7094.pdf

⁷ May also be considered a weak sod former

3. Seedbed Preparation

3a. Construction sites:

Seedbed preparation shall be done immediately after final shaping, grading or filling.

All loose areas will be smoothed and packed to a degree that will permit walking across without sinking in more than about one-half (1/2) inch.

Hard, compacted areas which would not permit seeding at about one-half (1/2) to three-quarters (3/4) inch depth, or placement of mulch at about two (2) to three (3) inch depth, will be tilled to a depth of about 3 inches. If necessary, the area will be smoothed and packed to meet conditions described in Herbaceous Vegetation Establishment Guide, Part 2.

Areas where equipment cannot be used shall be hand-worked, and must be approved by an NRCS representative prior to planting.

3b. Strongly saline sites:

Minimize soil disturbance as much as possible to maintain existing surface residues and minimize moisture evaporation from soil surface. Existing vegetation (i.e. foxtail barley) should be maintained to the extent possible provided good seed/soil contact can be attained.

4. Fertilizing

All areas that will not have at least two inches of topsoil will be fertilized with not less than 20 tons manure or 50 pounds of nitrogen (N) and 50 pounds of phosphorus (P₂O₅) per acre prior to seeding grass. Manure will be worked in during seedbed preparation.

5. Establishing Protective Cover

5a Construction sites:

Immediately following seedbed preparation, the areas not scheduled for mulching or sodding will be seeded to a protective cover of small grain or Sudan grass. Drill two bushels of spring small grains crosswise to slope prior to July. During July and August seed 30 pounds per acre of Sudan grass per acre. For fall cover crop use two bushels of winter wheat or winter rye per acre. Acres shaped too late for establishing a cover crop will be mulched or sodded.

Cover crops will be clipped to a height of six (6) to ten (10) inches before they mature or become too rank to permit any needed reinforcement seeding.

5b Strongly saline sites:

Utilize a saline tolerant cover crop during the year(s) prior to establishment of the permanent cover to intercept and utilize excess moisture before it evaporates from the soil surface and increase soil surface cover. See Table 1 in the Cover Crop specification for saline tolerant cover crop species.

6. Seeding

Seed crosswise to the slope. The area will be seeded to grass immediately following seeding to a protective cover crop; except that area to be mulched will be seeded immediately following shaping and seedbed preparation. "Double drilling" method will be used (seed the area at half the specified rate and repeat in a cross-wise fashion). Grass will not be seeded on areas to be sodded.

Where a drill cannot be used, broadcast seed and cover it by raking or dragging.

To minimize the impacts of salinity on seedling establishment, saline areas should be seeded when the salinity is at its lowest. This usually occurs in the spring of the year. However, excessive moisture in the spring makes most saline sites inaccessible to seeding equipment. Therefore, the fall dormant seeding date is the preferred. Seeding should occur once soil temperatures drop to 40° Fahrenheit for a minimum of 5 consecutive days (usually after November 1st) base upon North Dakota Agricultural Weather Network data or actual field measurements taken at a depth of 2 inches.

7. Mulching

If mulch is to be applied, it shall be in accordance with the ND-NRCS Standard and Specification for Mulching – 484. All conservation practices are found in FOTG – Section IV – Conservation Practices.

In situations where salinity levels severely restrict or prohibit plant growth, mulching may be necessary.

8. Establishing Vegetative Cover by Use of Seed Hay

The seed-hay method may be used for blowout areas or similar situations, in accordance with the Range Planting – 550 Standard.

9. Maintenance

Maintain native species plantings in accordance with Range Planting – 550 recommendations. Maintain introduced plantings in accordance with Forage and Biomass Plantings – 512 recommendations.

SODDING

Sodding is normally necessary only on the most critical of areas, where concentrated flow is expected or where early use of the area will not permit establishing vegetative cover by seeding.

Sod - The sod shall have a dense, well-rooted growth of perennial grasses native or adapted to the site. Approximately a 2-inch growth of grass must be present. If taller it shall be clipped, and clippings and debris shall be removed prior to rolling and transport. The sod shall be sufficiently moist to prevent breaking and crumbling. If the sod is dry, it will be watered to a depth of cut at least 12 hours prior to removal.

The sod shall be cut to a uniform thickness (approximately 1.5 inches) and will be placed within 24 hours after cutting, unless specifically waived by the engineer.

Uniform width strips, cut into lengths, which can be easily handled and laid without breaking, will be used.

Preparation of Earth Bed – The area to be sodded will be shaped to the required cross section. All stones, sticks, and other debris will be removed. The soil will be loosened to a depth of 1 to 3 inches. At this stage, 50 pounds nitrogen (N) and 50 pounds phosphoric acid (P₂O₅) per acre will be incorporated into the soil.

Placement of Sod – The sod strips will be laid with the long dimension crosswise to the expected flow, starting at the bottom end and working up. It will be laid so that the end joints are staggered. Each strip will be fitted snugly against the previously laid strip. As the sod is laid, it will be rolled or lightly tamped to make firm contact with underlying soil. Sod will be placed so the outer limits form a staggered or broken line. At points where water will start to flow onto the sod, the edge will be turned down, covered with topsoil, and firmly rolled or tamped to seal the edge. The lateral edges of the sodded area shall be back-filled with topsoil in such a manner that water from adjacent areas shall flow onto the sod. The topsoil will be compacted. No sod will be laid on frozen ground or when temperature is below 32° F.

Staking of Sod – Sod will be pegged or staked down at 2-3 foot intervals. The stakes will be placed in the upper half of each sod strip. Lath or equivalent stakes, ten (10) to twelve (12) inches long, will be used. The stakes will be driven plumb or with slight angle up-slope until the tops are approximately even with the top of the sod.

Surface Treatment – After the sod is laid, the sodded area will be cleared of loose sod, excess soil and other debris. All joints will be sealed with loose soil, or a thin layer of topsoil (approximately ¼ inch thick) will be sprinkled uniformly over the sod. The sod will be fertilized with 50-60 pounds of nitrogen per acre. (Sod may be fertilized prior to cutting provided it is watered.) The area will then be watered to the depth of site preparation.

Maintenance – When rainfall is not sufficient to maintain the sod in a moist condition, the sodded area will be kept moist by watering for at least 30 days (less 1 day for each day after September 1, but not less than 15 days). The frequency of watering shall be such that the lower half of the sod layer is maintained in a moist condition.

WOODY PLANTINGS AND SOIL BIOENGINEERING (STREAMBANK) PLANTINGS

If a woody planting is desired, consider using anchored mulch. Obtain prior approval from the State Plant Materials Specialist or NRCS State Forester for plantings involving woody species.