NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

CRITICAL AREA PLANTING

CODE 342
(ACRE)

DEFINITION

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 practices.

PURPOSE

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- Stabilize stream and channel banks, pond and other shorelines – Resource concern (SOIL EROSION – Excessive bank erosion from streams shorelines or water conveyance channels).
- Stabilize areas with existing or expected high rates of soil erosion by wind or water – Resource concern (SOIL EROSION – Concentrated flow erosion and/or SOIL EROSION - Sheet, rill, & wind erosion and/or SOIL QUALITY DEGRADATION – Concentration of salts or other chemicals).
- Stabilize areas, such as sand dunes and riparian areas – Resource concern (SOIL EROSION – Concentrated flow erosion and/or SOIL EROSION - Sheet, rill, & wind erosion).

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to highly disturbed areas such as:

- Active or abandoned surface mine sites,
- Urban conservation sites,
- Construction areas,
- Conservation practice construction sites,
- Areas needing stabilization before or after natural disasters such as floods, tornados, and wildfires,
- Eroded banks of natural channels, banks of newly constructed channels, and lake shorelines, and
- Other areas degraded by human activities or natural events.

CRITERIA

General Criteria Applicable to All Purposes

Site Preparation. A site investigation shall be conducted to identify any physical, chemical, or biological conditions that could affect the successful establishment of vegetation.

Areas to be planted will be cleared of unwanted materials and smoothed or shaped, if needed, to meet planting and landscaping purposes.

A suitable seedbed shall be prepared for all seeded species. Compacted layers will be ripped and the soil re-firmed prior to seedbed preparation.

As site conditions dictate, when grading slopes, stockpile topsoil to be redistributed over area to be planted.

For details on seedbed preparation, refer to Wisconsin Agronomy Technical Notes 5, Establishing and Maintaining Native Grasses, Legumes, and Forbs; and 6, Establishing and Maintaining Introduced Grasses and Legumes.

Specie Selection and Seed Quality. Species selected for seeding or planting shall be suited to local site conditions and intended uses, and be common to the site or location.

Selected species will have the capacity to achieve adequate density and vigor to stabilize the site within an appropriate period.

Seeding rates will be based on Pure Live Seed (PLS). Actual adjusted seeding rates will be based on the equivalent of 100 percent PLS, determined by multiplying the percent purity by total percent germination.

Untested introduced and native grass and forb seed are not approved for planting.

Only viable, high quality seed or planting stock will be used. Increase the seeding rate for legumes to accommodate percentage of hard seed.

Introduced and native legume seed shall be inoculated immediately prior to planting. Rhizobia inoculant shall be specific to the legume seeded. When more than one legume specie is used, each specie will be inoculated separately.

Sod placement shall be limited to areas that have adequate moisture or that can be irrigated during the establishment period.

Sod will be placed and anchored using industry techniques to ensure that it remains in place until established.

Seeding Periods. Seeding will follow planting zone dates. Refer to Figure 1 for planting zones and Tables 1 and 2 for seeding dates.

The specific date that provides the best chance for success will vary from south to north and from year to year with prevailing moisture and temperature conditions. Late summer seeding is generally riskier than spring seeding. Planting at either end of the allowable range is riskier than the middle of the range.

Seeding outside of the recommended dates must be approved by the Area Resource Conservationist or State Agronomist.

Frost seeding is not an authorized seeding method when using this standard.

Dormant seeding can be used when planting introduced species. When dormant seeding in concentrated flow areas, the site must be mulched according to the engineering design (if applicable) and Wisconsin NRCS Conservation Practice Standard (WI NRCS CPS), Mulching (Code 484).

Figure 1. Planting Zones

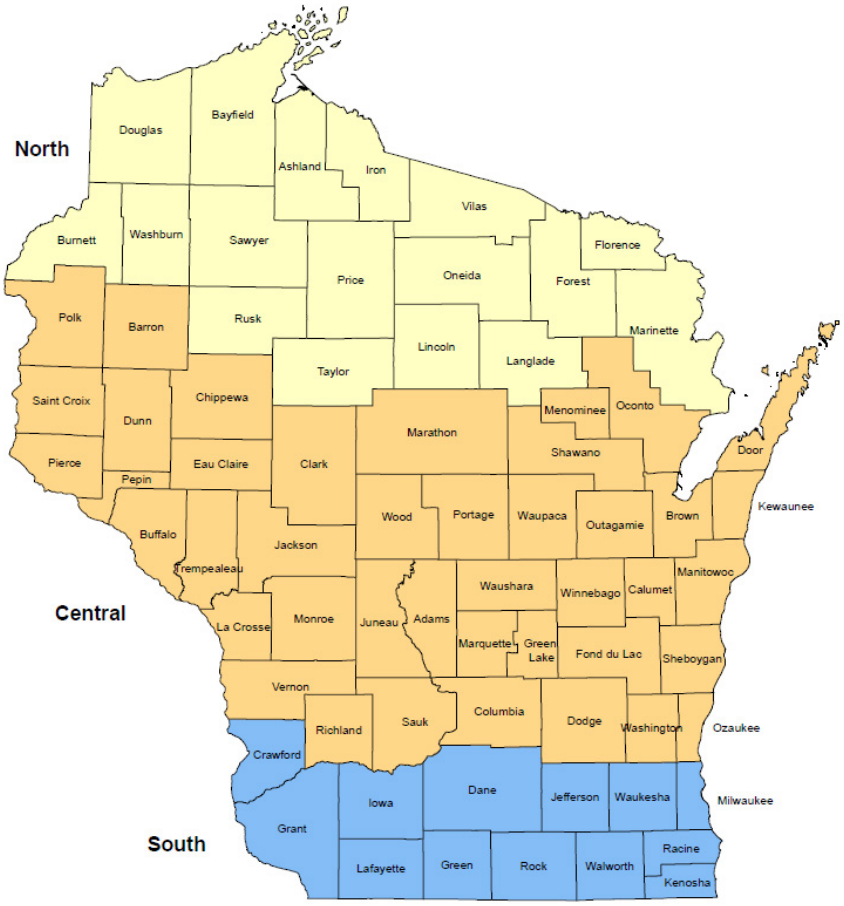


Table 1. Seeding Date/Ranges for Native Mixtures and Companion Crops

Zone	Spring Seeding
Northern	Thaw - 7/15
Central	Thaw - 6/30
Southern	Thaw - 6/30

Table 2. Seeding Date/Ranges for Introduced Grasses, Legumes, and Companion Crops

Planting Zone	Spring	Late Summer	Dormant
North	5/1 - 6/15	7/15 - 8/10	11/1 - Freeze Up
Central	4/15 - 6/1	8/1 - 8/21	11/1 - Freeze Up
South	4/1 - 5/15	8/7 - 8/29	11/1 - Freeze Up

Nutrient and Soil Amendment Requirements. When seeding introduced species, soil fertility and pH level will be amended to satisfy the needs of the plant species to be established. Fertilizer and lime recommendations will be determined by a soil test, and all nutrients will be applied following WI NRCS CPS, Nutrient Management (Code 590). If no soil test is available, apply a minimum of 150 pounds of 20-10-10 fertilizer and 2 tons of 80-89 lime or equivalent per acre. Soil amendments may be waived at the discretion of a certified conservation planner. The basis for waiving the use of soil amendments shall be documented in the client's case file.

For establishment of native species, use of soil amendments should not be used.

Seedbed Preparation. A minimum of 4 inches of friable soil material or topsoil shall be added and mixed to exposed rocky, sandy, gravelly, shale material, or extremely fine textured subsoil.

All gullies and deep rills will be filled and leveled during seedbed preparation.

Prior to planting into cropland fields, verify that herbicides previously applied to the site will not "carry over" and damage the new seeding.

Site preparation shall be adequate to assure weed suppression and to promote germination and growth of the species planted.

Planting equipment type, use, and timing shall be appropriate for the site conditions, soil characteristics, and type of seeds (size, etc.) selected to assure uniform placement and germination.

Refer to Wisconsin Agronomy Technical Notes 5 and 6 for detailed guidance for specific situations.

Mulching, Temporary Cover, and Companion Crop. Plantings shall be mulched as necessary to ensure establishment. Other disturbed areas shall be mulched as necessary to prevent erosion.

Mulching, temporary cover, and companion crops are vital practices utilized to support the establishment of a critical area planting. Temporary cover and companion crops suppress weed growth and limit soil erosion during the establishment period. Use depends on the site conditions, method of planting, and seed mixture.

For further details on mulching, temporary cover and companion crop recommendations, refer to Wisconsin Agronomy Technical Notes 5 and 6.

Criteria for Seed Mixture Development

Seeding rates are based on seeds per square foot of Pure Live Seeds. Refer to Wisconsin Agronomy Technical Notes 5 and 6 for the recommended species and seeding rates.

Approved species for critical area planting can be found in Wisconsin Agronomy Technical Notes 5 and 6. Species not listed in the technical notes must be approved in advance by the State Agronomist.

Introduced Grass and Legume Plantings on Critical Sites. Custom and standard mixtures will contain at least 50 percent grass seed of which 25 percent will be sod forming (not bunch) grass.

A minimum of 160 seeds per square foot is required for either a solid stand of grasses or a combination of grasses and legumes.

Increase seeding rate by 15 percent when dormant seeding occurs.

Refer to Table 8 of Agronomy Technical Note 6 for suggested seed mixes.

Native Herbaceous Plantings on Critical Sites. Native species are generally not recommended for critical area plantings due to their slow establishment and because they are clump grasses rather than sod forming. Only sod forming grasses are permitted in concentrated flow channels.

Additional Criteria to Stabilize Stream and Channel Banks, Pond and Shorelines

Bank and Channel Slopes. Channel side slopes shall be shaped so that they are stable and allow establishment and maintenance of desired vegetation.

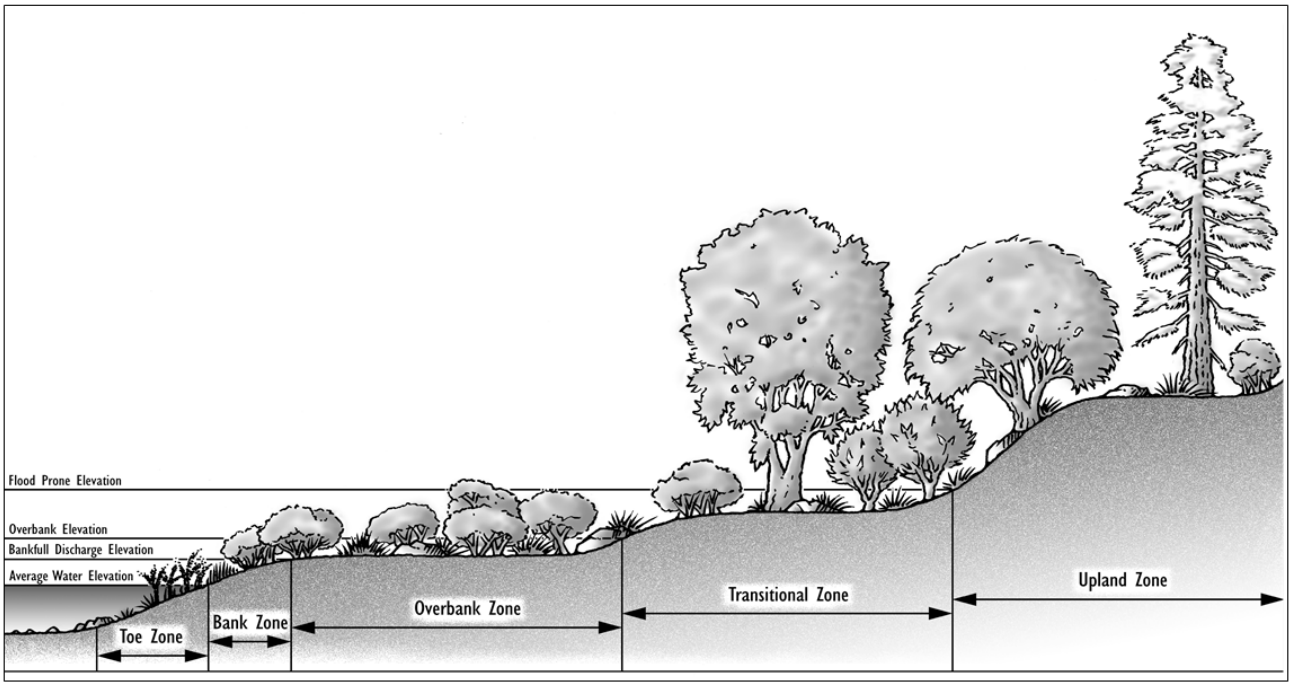
A combination of vegetative and structural measures may be necessary on slopes steeper than 2:1 to ensure adequate stability.

On sites that are too steep for regular seeding equipment to operate, the use of hydro-seeding and mechanically blown mulch is recommended. For more information regarding hydro-seeding, refer to Wisconsin Agronomy Technical Note 6.

Plant Materials used for this purpose shall:

- Be adapted to the hydrologic zone into which they will be planted,
- Be adapted and proven in the regions in which they will be used,
- When mature, produce plant communities that are compatible with those already existing in the area and,
- Protect the channel banks but not restrict channel capacity.

Figure 2.



Additional Criteria to Stabilize Areas with Existing or expected High Rates of Erosion by Wind and Water

The amount of plant biomass and cover needed to reduce wind and water erosion to the planned soil loss objective shall be determined using the current approved wind and/or water erosion prediction technology.

Do not use tillage where desirable vegetation is already present or where soil disturbance will increase the potential for erosion or cause sedimentation to environmentally sensitive areas.

Use a companion crop as added protection.

The toe of the slope, or the outlet of the concentrated flow channel, shall be stable before attempting seeding on the slope.

Concentrated flow may need to be diverted from the critical area during the establishment period.

CONSIDERATIONS

Minimize activities which disturb wildlife during the primary nesting season May 15 through August 1.

Heavy traffic and/or compacted soil areas may need special site preparation prior to seeding.

Consider planting native vegetation and/or local genotypes when restoring sites adjacent to remnant prairies.

Species or mixes that are adapted to the site and have multiple benefits should be considered. Native species may be used when appropriate for the site.

To benefit pollinators and other wildlife, consider using flowering shrubs and wildflowers and other forms that have resilient root systems and good soil holding capacity. These species should be used as a small percentage of the overall grass component.

Competition and poor establishment of some species. Seeds per square foot should not exceed 25 percent of the minimum requirement, with the exception of mixtures designed for wet mesic and wet sites.

Consider the use of soil bioengineering techniques to arrest and prevent slope failures and erosion. For approved design procedures, refer to Chapter 18 of the NRCS Engineering Field Handbook (EFH).

Consider alternatives to reduce or eliminate the delivery of sediment and associated pollutants into the riparian zone by implementing upland treatment practices.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for each field or management unit according to the Criteria and Operation and Maintenance sections of this standard. Specifications shall describe the requirements for applying this practice to meet the intended purpose using the appropriate specification and/or job sheets. The following elements shall be addressed in the plan, as applicable, to meet the intended purpose.

- Site preparation.
- Topsoil requirements
- Fertilizer application.
- Seedbed and planting area preparation
- Methods of seeding and planting
- Time of seeding and planting

- Selection of species.
- Seed/Plant source
- Seed Analysis
- Seeding rate/planting spacing
- Required Supplemental water
- Mulching (if applicable).
- Temporary cover or companion crop (if applicable).
- Describe successful establishment (percent ground cover, percent survival, stand density.

Specifications shall be recorded using Wisconsin Job Sheets 134, How to Establish and Maintain Introduced Grasses and Legumes; and 135, How to Establish and Maintain Native Grasses, Forbs, and Legumes

OPERATION AND MAINTENANCE

Use of the area shall be managed as long as necessary to ensure the site remains stable.

Plantings shall be protected from pests (weeds, insects, diseases, livestock or wildlife) as necessary to ensure long term survival.

Inspections, reseeding or replanting and fertilization may be needed to ensure that this practice functions as intended throughout its expected life. Observation of establishment progress and success should be performed at regular intervals unit he practice has met the criteria for successful establishment and implementation.

Sites may require on-going periodic maintenance consisting of mowing or herbicide treatment to control invasive pressure.

All areas to be grazed will follow a grazing plan that meets the criteria in the WI NRCS CPS, Prescribed Grazing (Code 528).

Grazing will be permanently excluded on high hazard sites, such as cut banks, areas of seepage, or other potential unstable areas.

FEDERAL, TRIBAL, STATE AND LOCAL LAWS

Users of this standard should be aware of potentially applicable federal, tribal, state and local laws, rules, regulations or permit requirements governing cover crops. This standard does not contain the text of federal, tribal, state or local laws.

REFERENCES

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USDA, NRCS, Wisconsin Agronomy Technical Note 5, Establishing and Maintaining Native Grasses, Forbs, and Legumes.

USDA, NRCS, Wisconsin Agronomy Technical Note 6, Establishing and Maintaining Introduced Grasses and Legumes.

USDA, NRCS, Wisconsin Job Sheet 134, How to Establish and Maintain Introduced Grasses and Legumes.

USDA, NRCS, Wisconsin Job Sheet 135, How to Establish and Maintain Native Grasses, Forbs, and Legumes.

DEFINITIONS

Actual Adjusted Seeding Rates. An increase in seeds per square foot or pounds per acre, when the PLS is less than 100 percent.

Aspect. The exposure of the site to direct sunlight, prevailing winds, and other factors that influence plant growing conditions. For example, a north slope tends to be cooler and moister while a south-facing slope tends to be drier and warmer.

Soil Bioengineering. Practice of combining mechanical, biological, and ecological concepts to arrest and prevent shallow slope failures and erosion.

Certified Seed. Seed that meets the standards established by the designated official seed certifying agency for the purpose of ensuring species/variety, species/varietal purity and mechanical quality. The Wisconsin Crop Improvement Association is the official seed certifying agency for Wisconsin.

Genotype. A group of individual plants which share a specified genetic makeup. For example, all big bluestem plants that are genetically adapted to grow and mature in the climatic conditions found in the driftless region could be considered a genotype.

Introduced Species. Plant species that historically were not native to North America and were brought here from other parts of the world, for example, smooth brome grass and alfalfa.

Native Species. Plants species that historically would have been found growing in North America such as big bluestem or green needle-grass.

Non-Certified Seed. Seed that is grown, processed, tested and labeled for species/variety and mechanical quality factors, but is not certified by an official seed certifying agency.

Pure Live Seed (PLS). PLS is a means of expressing seed quality, based on the percentage of seed in a seed lot that is both pure and viable. PLS is calculated by multiplying the percentage of total viable seed (germination + hard seed + dormant seed) by the percentage of pure seed divided by 100.

Tested Seed. A term used to describe seed quality attributes such as seed viability and vigor or assessment of percent germination of a given mass of seed evaluated. This term may be used to describe seed labeled as both certified and non-certified.

Untested Seed. Seed that has no assurances of testing for species/variety and mechanical quality, i.e., species/variety purity, inert matter, other crop or weed seeds and germination potential. Untested seed legally cannot be labeled.

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