



## Natural Resources Conservation Service

### CONSERVATION PRACTICE STANDARD

## CRITICAL AREA PLANTING

### CODE 342

(ac)

#### 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 seeding/planting methods.

#### PURPOSE

This practice is used to accomplish one or more of the following purposes:

- Stabilize areas with existing or expected high rates of soil erosion by wind or water
- Stabilize stream and channel banks, pond and other shorelines, earthen features of structural conservation practices
- Stabilize areas such as sand dunes and riparian areas

#### CONDITIONS WHERE PRACTICE APPLIES

This practice applies to stabilization of highly disturbed areas, such as:

1. Active or abandoned mined lands;
2. Urban restoration sites;
3. Construction areas;
4. Conservation practice construction sites;
5. Areas needing stabilization before or after natural disasters, such as floods, hurricanes, tornados, and wildfires;
6. Eroded banks of natural channels, banks of newly constructed channels, and lake shorelines;
7. Other areas degraded by human activities or natural events.

#### CRITERIA

##### General Criteria Applicable to All Purposes

##### **Grading Plan**

Develop a grading plan for installation of the practice based upon adequate topographic surveys and investigations. The plan will show the location, slope, cut, fill, and finish elevation of the surfaces to be graded. The plan will also include auxiliary practices for safe disposal of runoff water, slope stabilization, erosion control, and drainage. Where necessary, include practices such as waterways, ditches, diversions, grade stabilization structures, retaining walls, and subsurface drains.

##### **Site Preparation**

Conduct a site investigation to identify any physical, chemical, or biological conditions that could affect the successful establishment of vegetation.

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at <https://www.nrcs.usda.gov/> and type FOTG in the search field.

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NRCS, DE  
March 2018

Clear areas to be planted of unwanted materials, and smooth or shape as needed to meet planting purpose(s).

Prepare a suitable seedbed for all seeded species. Rip compacted layers and re-firm the soil prior to seedbed preparation, as needed.

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

### **Species Selection**

Select species for seeding or planting that are suited to local site conditions and intended uses, and are commonly used in the area. Selected species will have the capacity to achieve adequate density and vigor to stabilize the site within an appropriate period.

### **Establishment of Vegetation**

Plant seeds using the method or methods best suited to site and soil conditions.

Specify species, rates of seeding or planting, legume inoculation, minimum quality of planting stock (e.g., pure live seed (PLS) or stem caliper), method of seedbed preparation, and method of establishment.

Use only viable, high-quality seed or planting stock.

Seed or plant at a time and in a manner that best ensures establishment and growth of the selected species. Plant during approved times for the species to be used.

Refer to the applicable sections of the Delaware Conservation Planting Guide for additional requirements concerning species selection, planting, and establishment of herbaceous and/or woody species.

### **Soil Amendments**

Use soil tests to determine the optimum recommendations for both lime and fertilizer. Soil analysis shall be performed by a soil testing laboratory that has been accredited by the North American Proficiency Testing Program. At a minimum, soil samples taken for nutrient and pH analysis shall be from the soil layer that will be used as the surface layer (top 4 to 6 inches) for seeding. Follow sampling procedures recommended by the laboratory.

#### Lime

Apply lime to achieve a soil pH of 6.0 if legumes will be included in a planting, and 5.5 if only grasses or woody plants will be used. Lime materials shall be ground agricultural limestone that contains at least 50% total oxides (calcium plus magnesium oxide). Hydrated lime may be substituted for agricultural lime, except in hydroseeding applications. Do not use burnt lime as a soil amendment.

Pulverized limestone shall be ground to such fineness that at least 50% will pass through a 100-mesh sieve and at least 98% will pass through a 20-mesh sieve. Apply pulverized limestone with a drop spreader when high winds will not interfere with uniform distribution of the material or cause nuisance dust. Pulverized limestone may also be used in a hydroseeding slurry.

Granular limestone shall be of such fineness that at least 30% will pass through a 100-mesh sieve, at least 50% through a 60-mesh sieve, and at least 98% through a 20-mesh sieve. Apply granular limestone with a drop or rotary spreader, but do not use it in a hydroseeding slurry.

Pelletized limestone, a product composed of pellets of pulverized limestone, shall be of a pellet type and size that is recommended by the manufacturer for use with turfgrass. The limestone used in the manufacture of the pelletized limestone product shall meet the minimum fineness requirements for pulverized limestone. Apply pelletized limestone with a drop or rotary spreader, or it may be used in a hydroseeding slurry.

When a soil test is not feasible, apply lime according to the rates specified as follows:

Limestone applied at rates greater than 50 pounds per 1,000 square feet (or greater than 1 ton per acre) shall be incorporated into the upper 4 to 6 inches of the soil. Limestone applied at lower rates may be incorporated or left on the soil surface.

	Maximum Rates for Limestone Application	
	Tons/Acre	Lbs/1,000 SF
<b>Soil Texture</b>		
Clay, clay loam, and highly organic soil	3	135
Sandy loam, loam, silt loam	2	90
Loamy sand, sand	1	45

#### Fertilizer

The use of commercial fertilizer and other forms of plant nutrients must be in compliance with Delaware nutrient management regulations, as applicable. Apply fertilizer to prepared seedbeds, as needed based on soil test results. Fertilizer applied without a soil test may result in an inefficient quantity of nutrients for plant establishment, or could result in overapplication of nutrients leading to potential water quality problems and excessive weed growth.

In circumstances when a site is likely to have low nutrient levels (e.g., on a construction site) and obtaining a soil test is not feasible, use the following rates for starter fertilizer applications for grass- based plantings:

Species	Maximum Rates for Starter Fertilizer Application		
	N	P2O5	K2O
Cool-Season Grass (CSG)	40 Lbs/Ac (0.9 Lb/1,000 SF)	80 Lbs/Ac (1.8 Lbs/1,000 SF)	80 Lbs/Ac (1.8 Lbs/1,000 SF)
CSG + Legumes	20 Lbs /Ac (0.45 Lb/1,000 SF)	80 Lbs/Ac (1.8 Lbs/1,000 SF)	80 Lbs/Ac (1.8 Lbs/1,000 SF)
Warm-Season Grass (WSG) or WSG/CSG Mixes	N/A	60 Lbs/Ac (1.4 Lbs/1,000 SF)	60 Lbs/Ac (1.4 Lbs/1,000 SF)
WSG/CSG Mixes + Legumes	N/A	60 Lbs/Ac (1.4 Lbs/1,000 SF)	60 Lbs/Ac (1.4 Lbs/1,000 SF)

Starter fertilizer shall be applied at the time of seeding or up to 5 days after seeding. Unless otherwise specified by NRCS, 20-50% of total nitrogen shall be slow-release to provide nitrogen over a longer period of time and to reduce nitrogen leaching and runoff. Nitrogen is generally not recommended for use during the establishment of warm-season grass because it encourages increased weed competition.

All fertilizer shall be uniform in composition, free-flowing, and suitable for application by approved equipment. Fertilizers shall be delivered to the site fully labelled according to applicable state fertilizer laws and shall bear the name, trade name, or trademark, and warranty of the producer.

Organic Amendments

Apply manure and compost at a rate based on a nutrient analysis of that material. Organic amendments to sites shall be recommended only after an evaluation of any potential water quality hazards. To the extent practical, incorporate organic amendments into the upper 4 to 6 inches of the soil with a disk, springtooth harrow, or other suitable equipment.

**Topsoil**

Topsoil shall be added to a site when needed to improve the soil medium for plant establishment and growth, or when a sufficient amount was not available to stockpile. The use of topsoil shall be limited to slopes that are 2:1 or flatter.

Exposed soils shall be topsoiled if they have one or more of the following limiting factors:

1. Very shallow to bedrock or other restrictive layer (e.g., the subsoil is less than 6 inches deep);
2. Extremely acidic (pH less than 5.0); or,
3. Extremely salty (conductivity greater than 500 parts per million, or 4.0 millisiemens per centimeter).

Topsoil shall also be used when assurance of improved vegetative growth is desired.

Topsoil Quality

Topsoil shall be friable and loamy, free of debris, stones, or other materials larger than 1.5 inches in diameter. It shall be free of any known viable seeds or plant parts of noxious weeds or invasive plants.

Topsoil shall contain no toxic substance that may be harmful to plant growth. Soluble salts shall not be excessive (concentration greater than 500 parts per million). A pH range of 5.5 to 7.5 is required. If pH is less than 5.5, lime shall be applied and incorporated with the topsoil to achieve a soil pH of 6.0 if legumes will be included in a planting, and 5.5 if only grasses or woody plants will be used. Topsoil hauled in from off-site shall have a minimum organic matter content of 1% by weight, based on soil test results.

Topsoil Application

Before topsoiling, test the pH of the exposed subsoil. If the subsoil is highly acidic, add ground agricultural limestone at the rate of 4 to 8 tons per acre (200 to 400 pounds per 1,000 square feet). Distribute the lime uniformly, and work it into the subsoil as previously described in the section concerning Soil Amendments.

Immediately before spreading topsoil, the subsoil shall be loosened by disking or scarifying to provide a good bond for the topsoil. Where the slope of the site is flatter than 3:1, loosen the subsoil to a minimum average depth of 2 inches. On steeper slopes (up to 2:1), loosen the subsoil to a depth of 0.5 to 1 inch, or use a bulldozer to track up and down slope to create horizontal check slots that will prevent topsoil from sliding down the slope.

Topsoil shall only be handled when it is dry enough to work (less than field capacity) without damaging soil structure. Do not spread topsoil when it is partly frozen or muddy or on frozen slopes covered with ice or snow.

Topsoil shall be uniformly applied and lightly compacted to a minimum thickness of 4 inches. Subsoil with a pH of 4.0 or less, or containing iron sulfide, shall be covered with a minimum depth of 12 inches of topsoil.

Topsoil placed on slopes greater than 5% shall be promptly limed and fertilized (if needed), seeded, mulched, and tracked with suitable equipment.

**Seedbed Preparation**

Seedbed preparation shall be done when the soil is moist, but not wet. Apply lime, fertilizer, and other soil amendments evenly where needed on the site, as described in previous sections of these specifications. Either dry or wet application methods may be suitable.

Slopes Flatter Than 3:1

Work the soil to a depth of 3 to 5 inches with a disk or similar equipment. Continue tillage until a reasonably uniform seedbed is prepared.

Slopes 3:1 or Steeper

Scarify the soil surface with a bulldozer, heavy chain, hand tools, or other equipment that will loosen the soil 0.5 to 1 inch deep. After the soil is loosened, do not work it completely smooth, but leave it in a somewhat roughened condition. Follow the general contour when making the final surface preparation.

**Seed Quality and Treatment**

All seed shall be labeled and meet the requirements of the Delaware State Seed Law. Refer to Table 3.4 in the Delaware Conservation Planting Guide for minimum germination and purity requirements. Seed shall have had a germination test within 12 months prior to the date of sowing. Use of certified seed is preferred. Keep seed cool and dry until planting.

Species with seed lots greater than 50% hard seed shall be dehulled and/or scarified and planted no later than 60 days after scarification.

Grasses that have fluffy seeds shall be planted using specially designed native seed drills. Alternatively, mechanically remove beards or awns from such seeds to facilitate movement through conventional seeding equipment.

Legume seeds shall be inoculated with the proper, viable *Rhizobium* bacteria before planting. Keep inoculant as cool as possible until use and do not use it later than the date indicated on the package. When hydroseeding, use four times the recommended inoculant rate.

**Seeding Methods**

Seed shall be applied uniformly by hand, cyclone seeder, drill, cultipacker-seeder, or hydroseeder. The preferred method of seeding is by drilling or cultipacker-seeder method because these methods optimize seed to soil contact.

Seeding operations shall be done on the contour to the extent feasible. When a uniform distribution of seed is especially important (e.g., on lawns and athletic fields) and slopes are not extremely steep, apply seed in two directions, each perpendicular to the other. Apply one-half the seeding rate in each direction.

Drill

Seed shall be planted by using a grass drill or cultipacker-type seeder. A grain drill may also be used if it can be calibrated to plant small seeds at the recommended planting rates. As previously noted, plant grasses with fluffy seeds by using a specially designed native seed drill. All drills shall have packer wheels, chains, or similar devices to close the seed slot and provide good seed to soil contact. Do not plant small-seeded grasses more than 1/4 to 1/2-inch deep.

Broadcast

Seed may be broadcast by using a cyclone, ~~or~~ whirlwind seeder, or by hand. If spread by hand, small or light-seeded species, such as redbud or bluestem, may be mixed with filler (e.g., sawdust, finely ground corn, or slightly moistened peat moss) to achieve an even distribution. Incorporate seed into the soil 1/8 to 1/4-inch deep by raking or dragging, cultipacking, or tracking with heavy machinery. Raked areas shall be rolled with a weighted roller to provide good seed to soil contact. Do not use broadcast seeding methods during windy conditions.

Hydroseeding

This method is best suited for steep, inaccessible areas where use of a drill or other mechanized equipment is not feasible. Hydroseeding may be performed in two separate operations, with a slurry of seed and fertilizer applied in the first pass and mulch applied in the second pass, or in one operation (sometimes referred to as "hydromulching") to apply a slurry of fertilizer, seed, mulch, and tackifying agents. Do not use burnt or hydrated lime when hydroseeding. If legume inoculant is used, complete the

seeding within 3 to 4 hours after slurry is mixed or add a fresh supply of inoculant to the mix. If feasible after seeding, track the area up and down slope with heavy machinery, such as a bulldozer, to improve seed to soil contact.

### **Temporary Seeding and Nurse Crops**

When the period of soil exposure is more than two months but less than twelve months, use a temporary seeding (usually an annual grass) to provide short-term cover on disturbed areas. See Table 3.1 in the Delaware Conservation Planting Guide for recommended plant species and planting rates.

Temporary seedings shall be planted as a nurse crop with a permanent seeding mixture when rapidly growing cover is needed. When seeding toward the end of the listed planting dates for permanent seedings, or when conditions are expected to be less than optimal, select an appropriate nurse crop from Table 3.1 and plant with the permanent seeding mix. Companion seedings of small-seeded grasses shall not exceed 5% (by weight) of the overall permanent seeding mixture. Companion seedings of small grains such as barley, wheat, or oats shall be sown at one-third the rates listed in Table 3.1. Cereal rye generally should not be used as a nurse crop unless planting will occur in very late fall beyond the seeding dates for other temporary seedings. Cereal rye has allelopathic properties that inhibit the germination and growth of other plants.

Oats are the recommended nurse crop for warm-season grasses.

When a temporary or permanent seeding cannot be completed because of weather conditions or time of year, apply mulch only (no seeding) as a temporary cover when soil stabilization is needed. Refer to the conservation practice standard and specifications for Mulching (484) for materials, application rates, and methods.

### **Permanent Seeding**

Permanent herbaceous vegetation shall be designed to achieve a minimum stand density of 85 percent ground cover within one year. To establish permanent cover, select grass and grass/forb mixes according to Tables 3.2 and 3.3 in the Delaware Conservation Planting Guide.

When needed and feasible, supply new seedings with adequate water (a minimum of 1/4-inch twice a day) until vegetation is well established. This is especially necessary when seeding is performed in abnormally dry or hot weather or on droughty soils.

### **Mulching**

Mulch or otherwise stabilize plantings as necessary to ensure successful establishment.

Mulch shall consist of natural and/or artificial non-toxic materials of sufficient thickness and durability to achieve the intended effect for the required time period. Methods of anchoring mulch shall be sufficiently durable to maintain mulch in place until it is no longer needed.

Mulching is required for critical area plantings on structural measures (e.g., grassed waterways, diversions, embankments, etc.), and shall be applied elsewhere as needed. Refer to the Delaware conservation practice standard and specifications for Mulching (484) for materials, application rates, and methods.

### **Sod**

Limit sod placement to areas that can naturally supply needed moisture, or sites that can be irrigated during the establishment period. Place and anchor sod using appropriate techniques to ensure that it remains in place until established.

Commonly available sod types include Kentucky Bluegrass blends and Tall Fescue/Kentucky Bluegrass mixes

### Sod Quality and Treatment

Sod shall be state-certified sod that is at least one year old but not older than 3 years. Sod shall be machine cut to uniform thickness of 3/4-inch, plus or minus 1/4-inch, at the time of cutting. Measurement of thickness shall exclude top growth or thatch.

Standard size sections of sod shall be strong enough to support their own weight and retain their shape when suspended vertically with a firm grasp of the upper 10% of the section.

Individual pieces of sod shall be cut to the supplier's width and length. Maximum allowable deviation from standard widths and lengths shall be no more than 5%.

Sod shall be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period shall be inspected and approved prior to its installation.

Do not harvest or transplant sod when the moisture content (excessively wet or dry) may adversely affect its survival.

The optimum planting period is in early fall, followed by the spring planting period. Sod may be planted during the summer if supplemental watering will be provided until the sod is well established. The fall planting season is limited by the amount of time the sod has to develop roots before the ground freezes. Newly sodded areas usually need 4 to 6 weeks before the sod is sufficiently rooted. Similarly, the spring planting season is limited by the high temperatures and drought of summer, unless supplemental water will be provided.

### Installation

Prior to sodding, the soil surface shall be cleared of roots, brush, trash, debris, and other objects that would interfere with planting. Based on a soil test, apply lime and fertilizer as needed, and mix into the top 3 inches of soil. Rake the site smooth in preparation for laying the sod.

During periods of high temperature, lightly water the soil surface immediately before laying the sod. Lay sod strips lengthwise on the contour, never up and down the slope, starting at the bottom of the slope and working up. On steep slopes, use ladders to facilitate the work and prevent damage to the sod.

Lay sod strips in staggered rows, with joints butted tightly together to prevent voids. Roll or tamp the sod immediately following placement to insure solid contact of root mat and soil surface. Do not overlap the sod strips.

On slopes greater than 3:1, secure sod to the soil surface with wooden pegs or wire staples.

Where surface water cannot be diverted from flowing over the face of a sodded slope, install a capping strip of heavy jute or plastic netting, properly secured, along the crown of the slope and edges to provide extra protection against lifting and undercutting of sod. Use the same technique to anchor sod in water-carrying channels and other critical areas. Use wire staples to anchor netting in channel work.

### Supplemental Watering

Immediately following installation, water the sod until moisture penetrates the soil layer beneath the sod to a depth of 4 inches. Maintain optimum moisture for at least 2 weeks by lightly watering the sod on a regular (usually daily) basis, unless sufficient rainfall has occurred. Do not allow the sod to dry out completely. After the sod begins to take root, reduce the frequency of watering and increase the amount of water applied per watering. This encourages the development of a deep root system and ultimately reduces the amount of water needed.

### **Groundcovers**

On sites where grass is difficult to grow or maintain, other perennial groundcovers may be used to control erosion. Groundcovers are low-growing herbaceous plants, vines, and creeping shrubs that spread quickly to form a dense cover. These plants should not be expected to provide erosion control or prevent

soil slippage on sites that are inherently unstable due to soil texture, structure, water movement, or excessive slope.

#### Selection of Plant Species

Low-maintenance groundcovers are available to suit a variety of conditions, especially for small areas around homes and commercial buildings. These plants generally require more care than turf during the initial establishment period but may require less care after establishment.

Species recommendations may be found by consulting publications in the References section of this standard. Be cautious of using species that have aggressive growth habits and may spread beyond the planted area, especially if the planting is near a neighboring property or a natural area such as a shoreline or woodland. Species such as English Ivy (*Hedera helix*) and Periwinkle (*Vinca minor*) tend to grow rapidly once established, and should not be used except under well-contained conditions.

#### Installation

Prepare the soil by incorporating 2 inches of compost into the upper 8 inches of soil. If needed based on a soil test, incorporate lime and fertilizer into the soil.

Install the plants at a spacing that is based on their present size, expected rate of growth and size at maturity, and how quickly complete coverage is desired. In general, use a spacing of one plant for every 1 to 4 square feet and stagger the spacing of plants between rows.

Cover the entire planted slope with mulch that will provide sufficient erosion control during the establishment period. Refer to the conservation practice standard Mulching (484) for materials, application rates, and methods.

#### **Site Preparation and Access Control**

Restrict access to planted areas until fully established.

#### **Additional Criteria to Stabilize Stream and Channel Banks, Ponds and Other Shorelines, and Earthen Features of Structural Conservation Practices**

##### **Bank and Channel Slopes**

Shape channel side slopes 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 3:1 to ensure adequate stability.

##### **Species Selection**

Plant materials used for this purpose must:

1. Be adapted to the hydrologic zone into which they will be planted;
2. Be adapted and proven in the regions in which they will be used;
3. Be compatible with existing vegetation in the area;
4. Protect the channel banks but not restrict channel capacity.

Select native species over introduced species when commercially available. Native species can provide equal or better protection at a reasonable cost.

##### **Establishment of Vegetation**

The species used, planting rates, spacing, and methods and dates of planting shall be based on specifications in the Delaware Conservation Planting Guide.

Identify and protect desirable existing vegetation during practice installation.

Use a combination of vegetative and structural practices to mix plant materials with inert material when flow velocities, soils, and bank stability preclude stabilization by vegetative establishment alone. Refer to the Delaware conservation practice standard for Streambank and Shoreline Protection (580), and to other

technical guidance such as the NRCS Engineering Field Handbook Part 650, Chapter 16, *Streambank and Shoreline Protection*, and Chapter 18, *Soil Bioengineering for Upland Slope Protection and Erosion Reduction*.

Control existing vegetation that will compete with species to be established vegetatively to ensure successful establishment of the planted species.

#### **Additional Criteria to Stabilize Areas such as Sand Dunes and Riparian Areas**

Plants for sand dunes and coastal sites must be able to survive being buried by blowing sand, sand blasting, salt spray, salt water flooding, drought, heat, and low nutrient supply.

Include sand trapping devices such as sand fences or brush matting in the revegetation/stabilization plans where applicable.

Select native species over introduced species when commercially available. Native species can provide equal or better protection at a reasonable cost.

*Note: Specific programs may dictate criteria in addition to, or more restrictive than, those specified in this standard.*

#### **CONSIDERATIONS**

Assess site conditions including surrounding land uses, soils, available moisture during the growing season, and existing vegetation on the site and in adjacent areas, including any noxious weeds that may be present.

Consider the need for structural practices, in addition to this vegetative practice, to stabilize a critically eroding site. Planning and installation of other conservation practices such as Diversion (362), Subsurface Drain (606), or Underground Outlet (620) may be necessary to prepare the area or ensure vegetative establishment.

Consider the time of year for installation of this practice. Avoid periods of high runoff velocities or temporarily divert runoff from the planted area. This will allow the vegetation to become well established before it is subjected to storm flows.

Species or diverse mixes that are adapted to the site and have multiple values should be considered.

Consider the use of native species over introduced species when native species can provide equal or better protection.

Where appropriate, consider a diverse mixture of legumes and forbs to benefit pollinators and other wildlife. Also consider using flowering shrubs and wildflowers with resilient root systems and good soil-holding capacity for incorporation as a small percentage of a larger grass-dominated planting.

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

When selecting rooted plant materials, consider using younger planting stock because younger plants generally adapt more readily to new conditions than older plants.

Areas of vegetation established with this practice can create habitat for various type of wildlife. Maintenance activities, such as mowing or spraying, can have detrimental effects on wildlife. When wildlife habitat is a concern, perform management activities at the times and in a manner that causes the least disruption to wildlife.

*This practice has the potential to affect National Register listed cultural resources or eligible (significant) cultural resources. These may include archeological, historic, or traditional cultural properties. Care should*

be taken to avoid adverse impacts to these resources. Follow NRCS state policy for considering cultural resources during planning.

## PLANS AND SPECIFICATIONS

Plans and specifications for this practice shall be prepared in accordance with the previously listed criteria. Plans and specifications shall contain sufficient detail concerning site preparation and establishment to ensure successful management of the practice and may be recorded in narrative form, on Implementation Requirements (IR) worksheets, engineering designs and specifications, or on other approved forms.

Use the Delaware NRCS fact sheets *Cool-Season Grasses*, *Warm-Season Grasses*, and *Trees and Shrubs* to provide additional information when needed and complete the 342 IR worksheet.

When this practice is used to specify the vegetative component of another practice (e.g., diversion, filter strip, pond, etc.), plans and specifications shall meet the requirements of this standard and the other applicable standard to achieve the intended purpose of the practice. The completed work shall be checked and documented to verify that the practice was completed according to the drawings and specifications of both standards.

The following items shall be addressed, as appropriate:

1. Purpose of the planting (type of problem site), or conservation practice to be seeded/planted (if used as the planting component of another conservation practice);
2. Method of site preparation;
3. Topsoil requirements;
4. Rate and type of soil amendments to be applied;
5. Method of seedbed/planting area preparation;
6. Species and rates to be seeded/planted;
7. Method of seeding/planting;
8. Seeding/planting dates;
9. Rate and type of mulch and anchoring methods;
10. Protection of plantings.

## Supporting Data and Documentation

The following is a list of the minimum data and documentation to be recorded in the case file:

1. Location of the practice on the conservation plan map;
2. Assistance notes. The notes shall include dates of site visits, name or initials of the person who made the visit, specifics as to alternatives discussed, decisions made, and by whom;
3. Completed IR worksheet, and other specifications and management plans, as applicable.

**Additional Documentation for Construction Check Data/As-Built.** In addition to the general requirements listed above, the following is a list of minimum documentation to be included in the case file when Critical Area Planting (342) is used to specify the planting component of structural practices:

1. Assistance notes shall include inspection date(s), name of the person who performed the inspection(s), specifics as to what was inspected, alternatives and adjustments discussed, decisions made and by whom;
2. Dimensions of the stabilized area;
3. Certification statement on seeding/planting;
4. Final quantities and documentation for any quantity changes. Include materials certification when requested;

5. Sign and date check notes and plans to include the statement that the practice meets or exceeds the requirements of the NRCS conservation practice standard.

## OPERATION AND MAINTENANCE

An Operation and Maintenance (O&M) plan shall be prepared and is the responsibility of the client to implement. The appropriate fact sheet(s) and IR worksheet may serve as the O&M plan, as well as supporting documentation, and shall be reviewed with and provided to the client.

At a minimum, the following components shall be addressed in the O&M plan, as applicable:

1. For seeded areas, evaluate the site within several months of seeding. If the stand is uniform but too thin (50 to 80% ground cover), plant additional seed during the next optimum seeding period. Apply seed at one-half the original rate with a no-till drill, grain drill, or hydro-seeder as site conditions dictate. Sites with an establishment rate of less than fifty percent (50%) should be reseeded in accordance with the original planting plan. Determine the reasons for planting failure and incorporate corrective measures into the remedial planting;
2. If soil moisture becomes critically deficient, irrigate the site if feasible;
3. For sodded areas, water sod as needed for the first 30 days after placement;
4. Inspect the planting at least twice during the establishment year, then at least annually thereafter. Shape and replant areas damaged by heavy rainfall, livestock, chemicals, tillage, or equipment traffic, and any other areas where the vegetation is not adequate;
5. Check for insects and diseases, and if an incidence threatens stand survival, take corrective action to keep the pest under control;
6. Control undesirable plants by pulling, mowing, or spraying with a selective herbicide. Control noxious weeds as required by state law;
7. Protect the planting from wildfire and damage from livestock, wildlife, and equipment, to the extent feasible;
8. Where wildlife habitat is a concern, do not mow during the primary nesting season (April 15 to August 15);
9. Remove temporary diversions, silt fences, etc. after the area is stabilized;
10. Apply soil amendments periodically, based on soil test results, if needed to maintain ground cover density at the desired level (usually 90% or greater). At a minimum, test the soil at least once every five years, or more often if indicated by periodic inspections of the site. If woody plants are included in the planting, do not fertilize in the first year because the plants will develop too much top growth compared to the roots. If fertilizer is used, it must be applied in compliance with Delaware nutrient management regulations, as applicable;
11. Describe the acceptable uses (e.g., flash grazing, haying, etc.) and time of year or frequency of use restrictions, if any. *Pay particular attention to program requirements as they relate to acceptable vs. restricted uses and other management restrictions.*

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