

NATURAL RESOURCES CONSERVATION SERVICE
VIRGINIA CONSERVATION PRACTICE STANDARD

CRITICAL AREA PLANTING

(Acre)

Code 342

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.

PURPOSES

Stabilize areas with existing or expected high rates of soil erosion by water.

Restore degraded sites that cannot be stabilized through normal methods.

CONDITIONS WHERE PRACTICE APPLIES

On areas with existing or expected high rates of erosion or degraded sites that usually cannot be stabilized by ordinary conservation treatment and/or management, and if left untreated, could continue to be severely damaged by erosion or sedimentation or could cause significant off-site damage.

This Conservation Practice Standard shall not apply to natural or constructed channels within, or along the edge of a crop field, which are planned for the purpose of receiving and conveying surface runoff. Refer to the Virginia Conservation Practice Standard *Grassed Waterway (Code 412)* in these situations.

CRITERIA

GENERAL CRITERIA

Species selected for seeding or planting shall be suited to site conditions and planned uses.

Plant material, seedbed preparation, seeding rates, dates, depths, and planting methods will be consistent with the *Plant Establishment Guide for Virginia*.

Selected species will have the ability to achieve adequate density and vigor within an appropriate time frame to stabilize the site sufficiently to permit intended uses under ordinary management.

Species, rates, minimum quality of seed or planting stock, such as PLS or stem caliper, and method of establishment shall be specified before application. Only viable, high quality, and adapted seed or planting stock will be used.

Site preparation and seeding or planting shall be done at a time and in a manner that best ensures survival and growth of the selected species. What constitutes successful establishment, e.g. minimum percent ground/canopy cover, percent survival, stand density, etc., should be specified before site renovation.

Fertilization, mulching, or other facilitating practices for plant growth shall be timed and applied to accelerate establishment of selected species. When the recommended fertilizer rate exceeds the criteria in the Virginia Conservation Practice Standard *Nutrient Management (Code*

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

342-VA-2

590), appropriate mitigating practices will be installed to reduce the risk of nutrient losses from the site.

Comply with all applicable federal, state, and local laws, and regulations.

ADDITIONAL CRITERIA TO RESTORE DEGRADED SITES

If gullies or deep rills are present, they will be treated appropriately to allow safe machinery operation during seedbed preparation and seeding operations.

Soil amendments will be added as necessary to ameliorate or eliminate physical or chemical conditions that inhibit plant establishment and growth. Required amendments, such as compost or manure to add organic matter and improve soil structure and water holding capacity; agricultural limestone to increase the pH of acid soils; or elemental sulfur to lower the pH of calcareous soils shall be included in the site specification with amounts, timing, and method of application.

Conservation practices such as terraces, fence, diversions, etc. will be installed if needed to provide additional protection to the critical area. All supporting conservation practices will be designed and installed in accordance with their respective standard. Terraces and diversions will have adequate and stable outlets in place prior to their installation.

Topsoiling procedures will be followed where necessary, due to one or more adverse site conditions. Topsoiling specifications shall be included in the site renovation plan provided to the land user. The Standard and Specification 3.30 (Topsoiling) in Chapter III of the Virginia Erosion and Sediment Control Handbook may be used as a guide in addition to the guidance provided under Vegetative Establishment in this Standard.

VEGETATIVE ESTABLISHMENT

Site Preparation

When conventional seeding/planting is proposed (normally on slopes with a 3 to 1 ratio or flatter), grade and shape the area as needed to permit the safe use of equipment during all operations associated with cover establishment and maintenance. Roughen the soil surface lightly (minimum depth of 3 inches [8cm]) by heavy

equipment methods or with suitable farm tillage implements just prior to seedbed preparation. No-till seeding may also be an option.

Slopes steeper than a ratio of 3 to 1 will normally be seeded/planted by hand, or with a hydroseeder. Consequently, the slope surface should be left in a loose, friable, and slightly roughened condition during initial grading. If additional roughness is desired, stair-step grading, grooving, furrowing, or tracking may be accomplished with heavy equipment. Grooves or furrows should be at least three inches deep. Either method will create a suitable surface, conducive to the establishment of vegetative cover; however, tracking may cause severe surface compaction, and may not be as effective as other forms of roughening. On clayey soils, use this method only if there is no alternative. Sandy soils do not compact as severely, but tracking may still be the least effective method. Refer to the Standard and Specification 3.29 (Surface Roughening) in Chapter III of the Virginia Erosion and Sediment Control Handbook for guidance.

Site preparation with heavy equipment shall be limited to the extent possible, particularly on areas planned for trees/shrubs. Soil compaction could be very adverse to the successful establishment of these cover types. Grading of slopes should be performed only to the extent necessary to ensure stability. Soil surfaces should be left in a near natural condition when establishing trees and/or shrubs.

Do not leave sites in an "excessively" bladed condition. This tends to create a uniform, smooth, hard surface.

Remove any surface debris that may interfere with conventional cover establishment and/or maintenance operations.

On relatively small areas with slopes on a 2 to 1 ratio or flatter, and where ornamental type plants or high maintenance ground covers will be established, remove and stockpile topsoil (if significantly present) prior to necessary grading, and/or installation of erosion control measures. After initial grading is complete, and any required erosion control measures have been installed, scarify the sub-layer to a minimum depth of 3 inches (8 cm). Spread stockpiled topsoil evenly over the area. Additional topsoil shall be brought

in, if needed, to obtain a minimum thickness of four (4) inches on slopes flatter than a 3 to 1 ratio. Topsoil shall be applied to a minimum thickness of 2 inches (5 cm) on 3 to 1 ratio slopes or steeper.

NOTE: Topsoiling of slopes steeper than a 2 to 1 ratio is not recommended unless good bonding can be achieved. Refer to the Standard and Specification 3.30 (Topsoiling) in Chapter III of the Virginia Erosion and Sediment Control Handbook for guidance.

Topsoil should be applied on any site where adverse soil properties or site conditions exist which will prevent the successful establishment of desired vegetation and where it can be applied properly and safely.

Topsoil shall be a sandy loam, clay loam, silt loam, or sandy clay loam. It shall be free of trash, stumps, roots, significantly large rocks, noxious weeds, and toxic substances, etc. Do not apply topsoil over subsoil with contrasting textures.

If applicable, install needed erosion control measures such as terraces, diversions, berms, grassed waterways, grade stabilization structures, level spreaders, channel liners, debris basins, or seepage drains.

All site preparation activities, including ripping or scarifying, shall be performed as close to the contour as possible.

Seedbed Preparation

All required seedbed preparation should be performed just prior to and in conjunction with seeding/planting operations. The site may need re-working if significant rainfall occurs between the initial seedbed preparation and the seeding/planting operation.

Sites which prohibit the use of conventional equipment should be prepared in such a manner that the soil surface remains in a loose and friable condition. This can be accomplished with heavy equipment during, and as a part of site preparation. Soil disturbance can also be accomplished with the use of a chain harrow, pick chain, hand tools, or other suitable equipment. When hand planting trees/shrubs or hydroseeding ground covers, seedbed preparation may not be necessary if adequate site preparation was performed.

On sites where the use of conventional equipment is proposed, prepare a proper seedbed by disking, harrowing, or by using other suitable tillage implements.

Incorporate required lime and/or fertilizer into the top 3 to 6 inches (8 to 15 cm) of soil as a part of seedbed preparation. Generally, the recommended amount of lime and/or fertilizer will be included in the slurry mix when hydroseeding.

All required seedbed preparation should be performed as close to the contour as possible.

Refer to the *Plant Establishment Guide for Virginia* and the publications referenced in this Standard for specific guidelines on establishing native warm season grasses (NWSG).

Fertilizer and Lime Requirements

Grasses and Legumes

Apply lime and fertilizer in accordance with soil test recommendations.

Trees and Shrubs

Apply lime and/or fertilizer in accordance with soil test recommendations. Do not apply lime without a soil test. Trees and shrubs will probably do well at a pH level of 4.5 to 5.5. Liming without soil test information may result in an unnecessary expense, as well as the possibility of increasing the pH to an adverse level.

Seeding/Planting Operation

Refer to the *Plant Establishment Guide For Virginia* for an approved list of permanent and temporary plant species, seeding/planting rates, and recommended dates for establishing vegetative cover, trees, and shrubs on critical areas.

Grasses and Legumes

A nurse crop such as annual rye for the fall, or an annual such as foxtail millet for the spring should be seeded with the permanent species to provide quick cover and erosion protection. Sow small

342-VA-4

grain or millet at a rate of twenty-five (25) pounds per acre along with the permanent species.

Establishment should be monitored and, on sites where farm machinery can be safely operated, remove the nurse crop by mowing, etc., if its growth has the potential to adversely affect the establishment of the permanent species. Controlled and limited livestock grazing or haying may be an alternative under site-specific conditions.

Legume seeds should be inoculated within one hour prior to planting time with the proper inoculant. When more than one legume is being seeded, the correct inoculant for each legume must be used. Use twice the recommended rate of inoculant for each seed type when seeding by conventional methods and four times the rate when hydroseeding. A medium recommended by the manufacturer to bond the inoculant to the seed should also be used. The inoculant and/or the inoculated seed shall be protected from the sun and excessive heat at all times. Inoculants shall not be used beyond their expiration date.

Where conventional equipment is used, apply seed uniformly over a freshly prepared seedbed with a drill, cultipacker seeder, or cyclone seeder. Seeding may be done by hand on areas where it is not practical or feasible to use seeding equipment. When seeding by hand, or with a cyclone seeder, sow one-half of the mixture rate in one direction and the remaining half at a right angle to the first. Incorporate surface applied seed with a spike tooth harrow, or by hand raking on small areas. Firm the seedbed with a cultipacker unless a cultipacker seeder is used. Follow the contour as much as possible when using soil contact equipment.

For all conventional seeding of the permanent species, with the exception of native warm season grasses (NWSG), seed should be placed to a depth of 1/4 to 1/2 inch depending on seed size and soil type. Seeding depth should be closer to 1/2 inch on sandy soils and/or for larger size seeds. Do not exceed a depth of one inch for all conditions. The maximum seeding depth for warm season grasses should be 1/4 inch on all soil types.

When hydroseeding, first mix the lime, fertilizer, and hydro-mulch in the recommended amount of water. Mix the seed and inoculant together, and add to the slurry just prior to seeding. Always add a small amount of lime to any mix to improve the survival rate of the rhizobium bacteria, because the bacteria are very intolerant of acid conditions. Mix thoroughly,

and apply the slurry uniformly over the prepared site. Assure that agitation is continuous throughout the seeding operation and that the mix is applied within one hour of initial mixing.

When renovation is performed outside of the recommended seeding dates for the selected permanent species, and seeding is performed conventionally, the area shall be seeded to temporary ground cover. Planting depth for small grains, millet, or Sudan grass should be 1 to 2 inches. Follow up with permanent seeding/planting at the first available recommended establishment period. When temporary cover has been seeded, use a no-till drill to seed permanent species of grasses and/or legumes into the temporary cover. Perform additional seedbed preparation necessary to smooth out rills and/or gullies that may have formed since the initial seedbed preparation.

Trees/Shrubs

These types of plants may be established in mass, individually at random, in clumps, or in rows. Select species with wildlife benefits, if site conditions permit. Use three or more species for wildlife habitat diversity.

Seed an approved ground cover mixture with shrub plantings to serve as a "nurse crop" when needed for erosion control and/or for additional wildlife habitat while shrubs become established. A good tree-compatible ground cover mix should include annual and perennial grasses and legumes. They should be slow growing, have a sprawling growth form, and be tolerant of adverse conditions. Do not use KY-31 tall fescue, sericea lespedeza, or any of the clovers (except white).

NOTE: A recommended mix is listed in the *Plant Establishment Guide for Virginia*.

Do not plant during freezing temperatures or when the soil surface is frozen.

Seedling roots shall be protected from drying out prior to and during the planting operation.

All machine planting should be done as close to the contour as possible.

Mulching

Mulch will be applied on all sites in accordance with the NRCS-Virginia Conservation Practice Standard *Mulching (Code 484)*. Generally, small grain straw is more readily available and is the recommended choice as a mulching material on conventionally seeded sites. If used, apply straw mulch at the rate of 2 tons per acre (5 tons/hectare) immediately after the seeding/planting operation. Straw mulch shall be anchored with netting, if determined by the planner to be needed.

Generally, cellulose fiber is the recommended type of mulch to include in the slurry mix when hydroseeding.

Depending on site conditions, additional or substitute protective measures will be used if deemed necessary. Examples include jute mesh, silt fences, bale barriers, and soil stabilization blankets or mats. Straw bale barriers and other protective measures shall be installed properly. Follow manufacturer's specifications and recommendations in the installation of man-made measures. The [Virginia Erosion and Sediment Control Handbook](#) may also be used as a guide.

Environmental Concerns

The landowner is responsible for obtaining all federal, state, and local permits prior to NRCS construction assistance.

Potential impacts to adjacent wetland areas must be addressed. USDA wetland conservation provisions apply. The practice must comply with NRCS wetland technical assistance policy contained in [GM 190](#), Part 410.26.

Planning and implementation of this practice will be preceded by an environmental evaluation using the "Environmental Evaluation Data Sheet", Form VA-EE-1 and related guidelines found in [GM-190](#), part 410 (Virginia Amendments).

CONSIDERATIONS

Evaluate the site; i.e., surface condition, soil condition, slope steepness, potential runoff from adjacent lands, sunlight exposure, planned land use, etc., prior to developing a restoration plan.

Give special attention to site exposure when shrubs are included in the planting plan. Shrub growth, and fruit/seed production, in particular, will be reduced on north facing or shaded sites. Shrubs established along edges exposed to the east, west, or south generally are more successful.

Select no or low maintenance, long-lived plants adaptable to sites which may be difficult to maintain with equipment.

Consider landowner/user objectives when developing alternatives.

Consider seeding companion or nurse crops in combination with permanent ground covers, especially on the more adverse sites and/or during marginal seeding periods.

When permanent seedings are scheduled to follow a previously seeded summer or winter annual specie, consider using a no-till drill to seed the permanent specie where site conditions permit.

If feasible and practical, consider irrigating the newly seeded/planted area if droughty conditions exist.

Consider use of native plants or locally adapted plants when selecting cover types and species for wildlife habitat. Species or mixes that have multiple values should be considered.

The plants should not be more palatable than other plants that will remain in the area, if subjected to grazing.

The plants should be compatible with planned landuse and not pose a potential weed problem.

Consider the need for fencing (temporary or permanent) out the critical area if subject to being grazed by livestock.

Planning and scheduling with the landowner/user should be done well in advance, so restoration of the site can be accomplished during the recommended establishment period for the species selected.

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

PLANS AND SPECIFICATIONS

Specifications for installation and maintenance of this Standard shall be prepared according to the Criteria, Considerations, and Operation and Maintenance described in this Standard and shall be recorded on approved specification sheets, job sheets, and as narrative statements in conservation plans.

As a minimum, record and maintain the following planning and design data. Include information on either the drawings, approved forms, or in the engineering field book as appropriate:

DESIGN DATA

- Completed Form VA-EE-1
- Location map. Including farm number, tract number, field number, and approximate acreage
- Vegetative establishment requirements to include but not limited to: types and species of vegetation planned, site preparation required, seeding rates and method of seeding grasses and/or legumes, planting rate and spacing for shrubs, amount and type or types of inoculant, lime and fertilizer requirements, kind and rate of mulch, amount of netting if required, proposed date range of establishment, and a record of additional erosion control practices and/or measures if needed.

CHECK DATA

As a minimum, record and maintain the following check out data:

- Actual acreage renovated
- Date of establishment
- A statement indicating extent of compliance with this Standard. Document the condition of vegetative cover at time of final check out.

REPORTING AND/OR CERTIFYING PROCEDURE

Reporting the critical area as "applied" and/or certifying the completion of this practice will only be

done after the practice has been installed in accordance with this conservation practice standard and seeding/planting of the permanent species was performed within the recommended time period. If seeding/planting of the permanent species is performed outside of the recommended time period, reporting and/or certifying will not be done until the vegetative cover becomes sufficiently established to carry out its intended function.

OPERATION AND MAINTENANCE

REQUIREMENTS

Operation and maintenance requirements shall be reviewed with the landowner and should include the following items and others as appropriate:

A maintenance program shall be established to maintain a vigorous vegetative cover. Vegetation damaged by machinery, herbicides, or erosion must be repaired promptly.

The area shall be protected from offsite flow, and from livestock grazing until vegetation is well established and the site is stabilized.

Inspect the site regularly, especially after heavy rains, until plantings become well established. Damaged areas will be filled, compacted, and seeded as soon as conditions permit.

Evaluate the site within several months of seeding. If the stand is uniform but too thin (50 to 80% ground cover), apply additional seed during the next optimum seeding period with a no-till drill, grain drill, or hydroseeder as site conditions dictate. Sites or random areas with an establishment rate of less than fifty percent (50%) will be reseeded in accordance with the original planting plan. Replant trees and shrubs during the next available planting season, if required, to obtain at least a (60) sixty percent survival rate uniformly over the entire site.

Once cover becomes established, inspection shall become an on-going process and any failures shall be promptly corrected. Use caution when spraying chemicals on adjacent lands.

If soil moisture becomes critically deficient, irrigate the site if practical and feasible.

Competitive weed growth should be controlled by mowing and/or with herbicides. Plantings that

provide significant wildlife nesting cover should not be sprayed, mowed, or grazed during the nesting season (April 1 - August 15).

One year after establishment, lime and fertilize at the beginning of the growing season in accordance with a soil test. Thereafter, test the soil every 3 to 4 years and apply needed lime and fertilizer.

Native warm season grasses (NWSG) and shrubs specifically established with wildlife habitat being the primary objective may not require fertilization. Refer to referenced material in this Standard for guidance.

Native warm season grasses normally take longer than cool season grasses to become established; therefore, allow additional time before evaluating success rate.

Native warm season grasses should be burned or mowed every 2-3 years outside of the nesting season (April 1 to August 15) with the exception that it should not be cut after August 25th. (Removal of mowed material by haying, etc. is beneficial to wildlife.) NOTE: All prescribed burning shall be planned and conducted with the assistance of the Virginia Department of Game and Inland Fisheries, Virginia Department of Forestry, or other certified burner.

For tree and shrub plantings, competitive weed growth should be controlled by appropriate methods such as mowing, hand pulling, or herbicide application.

REFERENCES

1. Forestry BMPs for Water Quality in Virginia, Technical Guide, 1/97, Virginia Department of Forestry.
2. Virginia Erosion and Sediment Control Handbook, Third Edition, 1992, Division of Soil and Water Conservation, Virginia Department of Conservation and Recreation.
3. NRCS-VA, Field Office Technical Guide, Section IV.
4. "Conservation Plant Sheets in the Northeast", NRCS.

5. "Native Warm Season Grasses for Virginia and North Carolina", Virginia Department of Game and Inland Fisheries.
6. "Virginia Pest Management Guide", Virginia Cooperative Extension Service.
7. GM-190, Part 410 (Virginia Amendments).
8. *Plant Establishment Guide for Virginia*.

NATURAL RESOURCES CONSERVATION SERVICE

VIRGINIA CONSERVATION PRACTICE STANDARD

CRITICAL AREA PLANTING

Approved Practice Narratives

(Acre)

CODE 342

342 D1 Critical Area Planting: The area will be graded, shaped, and established to permanent vegetative cover in accordance with an approved restoration plan, as required by this standard, and as indicated on plan map.

342 D2 Critical Area Planting: Existing renovated sites will be maintained in accordance with this standard, and as indicated in the Operation and Maintenance Plan provided.

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