NATURAL RESOURCES CONSERVATION SERVICE

VIRGINIA CONSERVATION PRACTICE STANDARD

FIELD BORDER

(Acre)

CODE 386

DEFINITION

A strip of permanent vegetation established at the edge or around the perimeter of a field.

PURPOSE

This practice may be applied to accomplish one or more of the following:

- Reduce erosion from wind and water
- Protect soil and water quality
- Manage pest populations
- Provide wildlife food, cover and pollinator habitat
- Increase carbon storage
- Improve air quality

CONDITIONS WHERE PRACTICE APPLIES

This practice is applied around the perimeter of fields. Its use can support or connect other buffer practices within and between fields. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown.

Do not use this standard where water quality is the primary resource concern. Use the Virginia Conservation Practice Standards *Filter Strip (Code 393)* and/or *Riparian Herbaceous Cover (Code 390)* in lieu of this standard where appropriate.

This standard does not apply where concentrated flows are anticipated, or to constructed channels along the edge of a row crop field, which are used to receive and convey surface runoff. Refer to the Virginia Conservation Practice Standard *Grassed Waterway (Code 412)* in these situations.

CRITERIA

General Criteria Applicable to All Purposes

Minimum field border widths shall be 35 feet but may be increased based on the purpose or purposes for installing the practice, and will be increased if needed to provide sufficient turn around space for farm equipment.

Establish field borders adjacent to field edges to the extent needed to meet the resource needs and producer objectives.

Establish the field borders with site adapted species of permanent grass, legumes and/or shrubs that accomplish the design objective and do not function as host for field crop diseases.

Select plants for field borders with the physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Use the *Plant Establishment Guide for Virginia* as the standard for selecting approved species.

Ensure seedbed preparation, seeding rates, dates, depths, fertility requirements, and planting methods are consistent with approved local criteria and site conditions.

Eliminate ephemeral gullies and rills present in the planned border area as part of seedbed preparation. If present, ephemeral gullies and rills located immediately upslope from the planned border area need to be treated to ensure that mainly sheet flow enters the planned border area.

Additional Criteria to Reduce Erosion from Wind and Water

Time the field border establishment, in conjunction with other practices, so that the

soil will be adequately protected during the critical erosion period(s).

Establish stiff-stemmed, upright grasses, grass/legume mixes or forbs to trap wind- or water-borne soil particles.

Determine the amount of surface and/or canopy cover needed from the field border using current approved water and wind erosion prediction technology. Calculations must account for the effects of other practices in the management system.

Wind Erosion Reduction. Locate borders to provide a stable area on the windward edge of the field as determined by prevailing wind direction data.

Minimum height of grass or forbs must be one foot during the critical erosion period.

Water Erosion Reduction. Locate borders to eliminate sloping end rows, headlands, and other areas where concentrated water flows will enter or exit the field.

Orient plant rows as closely as possible to perpendicular to sheet flow direction.

Additional Criteria to Protect Soil and Water Quality

Do not burn the field border if the main goal of the field border is to protect soil or water quality.

Reducing Runoff and Increasing Infiltration. Locate borders around the perimeter of the field, or as a minimum, install borders to eliminate sloping end rows, headlands and other areas where concentrated water flows will enter or exit the field.

Water Quality – Absorbed, Dissolved and Suspended Contaminants. As a minimum, locate field borders along the edge(s) of the field where runoff enters or leaves the field. The border must have a vegetation stem density/retardance of moderate to high (e.g. equivalent to a good stand of wheat).

Design border widths to comply with all applicable State and local regulations regarding manure and chemical application setbacks.

Reducing Soil Compaction from Equipment Parking and Traffic.

Design border widths to accommodate equipment turning, parking, loading/unloading equipment, grain harvest operations, etc.

Additional Criteria to Manage Pest Populations

Provide a Harbor for Beneficial Organisms (e.g. insects, mites, etc.). Include appropriate plants that attract beneficial organisms that prey on target pests.

Schedule mowing, harvesting, pesticide applications and other disturbance activities to accommodate life cycle requirements of the beneficial organisms.

Provide a Habitat to Cause Pests to Congregate. Select plants for the field border that attract pests where appropriate (e.g. alfalfa strips planted to lure lygus bugs away from a cotton crop).

Additional Criteria to Provide Wildlife Food and Cover

Establish plant species that provide wildlife food and cover for the target wildlife species. Schedule mowing, harvest, weed control, and other management activities within the field border outside of the nesting season (April 15 to August 15).

Maintain vegetative successional state to accommodate targeted wildlife species requirements.

When wildlife and/or pollinators are a concern, a lower percent groundcover than would be needed if protecting soil and water quality was the only goal is acceptable as long as the soil resource concern is also adequately addressed (i.e. no excessive soil loss). This may be achieved by simply increasing the field border width.

Borders established for wildlife shall have a minimum width of 35 feet consisting of shrubs and/or herbaceous plants. If establishment is a combination, the herbaceous component shall be at least 10 feet wide. The greater the border width, the better for wildlife.

Shrub borders will consist of at least four parallel rows. Space rows 10 feet apart, with a spacing of 5 feet between plants in the row. Use a spacing of 4 feet by 4 feet (or 3x3) when planting VA 70 shrub lespedeza. Clumping of shrubs is permissible.

Plant shrubs no closer than 15 feet from the tree base when adjacent to “sapling and/or smaller” trees.

Plant shrubs no closer than the drip line edge of trees when adjacent to “mature” woodland.

Plant a minimum of three shrub species for greater diversity. Use species mixes for herbaceous plantings.

When establishing shrub borders adjacent to woodland, plant a majority of the tallest growing species along the woodland edge and shortest growing species nearer the field edge. Establish herbaceous strips to the field side of the shrub component.

All field border maintenance activities will be scheduled outside of April 15-August 15 to accommodate reproduction and other requirements of target wildlife species.

Do not use borders established for wildlife primarily as machinery turn areas. Additional widths for these purposes shall be provided.

In cases where loss of existing field size/use is a concern, a cutback field border may apply. Cut all woody vegetation greater than 1 inch in diameter for a minimum strip width of 35 feet into the woods. Maintain by cutting or using herbicide every 4-5 years. To improve the border for wildlife, cut woody regrowth into linear 200-500’ sections so that each section is cut rotationally every 4-5 years. A minimum 15-foot wide disc strip or grass/forb planting can also be added on the field edge to add habitat diversity.

Additional Criteria to Increase Carbon Storage

Establish plant species that will produce adequate above- and below-ground biomass for the site (i.e. a positive soil conditioning index).

Maximize the width and length of the herbaceous border to fit the site and increase total biomass production.

Do not burn if the main goal of the field border is carbon storage.

Do not disturb the roots of the established vegetation with tillage.

Additional Criteria to Improve Air Quality

Establish plant species with morphological characteristics that optimize interception and adhesion of airborne particulates. Select plants with persistent roots and residue that stabilize soil aggregates and capture airborne soil particles.

Establish species resistant to damage from equipment traffic.

CONSIDERATIONS

Consider planting field borders around the entire field, not just on the field edges where water enters or leaves the field, for maximizing multiple resource protection.

Increase soil particle trapping efficiency of the field border by establishing a narrow strip of stiff-stemmed upright grass at the crop/field border interface.

Native plants are best suited for wildlife habitat enhancement and provide other ecological benefits where adapted to site conditions and when consistent with producer objectives.

Include native plants that provide diverse pollen and nectar sources to encourage local pollinator populations.

Use field borders as corridors to connect existing or planned habitat blocks.

Prescribed burning, strip disking, or selective herbicide applications are management tools that can be used to maintain suitable habitat for specifically desired wildlife species.

Additional value can be provided by adding a disc strip (minimum 15 feet wide) either on the field side or between the shrubs and planted herbs when a firebreak is needed.

Overseed the field border with legumes for increased plant diversity, fertility, soil quality, and wildlife benefits.

Waterbars or berms may be needed to breakup or redirect concentrated water flow within the borders.

Consider improving infiltration in compacted soils prior to field border establishment.

Consider the use of mycorrhizal inoculants during border establishment to improve carbon sequestration.

In selecting plant species to establish in the field border, among other items, consider the plant's tolerance to:

- Sediment deposition and chemicals planned for application.
- Drought in arid areas or where evapotranspiration can potentially exceed precipitation during the field border's active growing period(s).
- Equipment traffic.

Design border widths to match the required field application setback widths for easier management (i.e. land-use and management access occur in the same location).

Establish plant species that will have the desired visual effects and that will not interfere with field operations or field border maintenance.

Consider the amount of shading that the field border or portions of the field border may experience and select species for those locations accordingly.

The use of native perennial plant species as opposed to annual species provides a longer period of resource protection and greater potential for carbon sequestration.

Consider installing a contour buffer system, No Till practice or other conservation practices on adjacent upland areas to reduce surface runoff and excessive sedimentation of field borders.

A combination of border strips consisting of different plant species and growth forms may be established to increase wildlife habitat diversity. Habitat value also increases as border width increases.

Shrub borders enhance wildlife habitat by providing a transition zone (soft edge) between woods and crops, or between woods and other herbaceous vegetation. Shrub borders will provide escape cover where woody vegetation is lacking. Planted herbaceous components add primarily nesting and some broad cover, while disked areas provide favored brood feeding and overhead cover.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for each field or treatment unit according to the Criteria included in this Standard. Specifications shall describe the requirements for applying this practice to meet the intended purpose. Record practice specifications on the Field Border 386, Conservation Practice Job Sheet. The following components shall be included for recording this specification:

- Field Border widths and lengths based on local design criteria.
- Field Border location(s) within the field(s) or farm boundary.
- Species to be used and the location and planting density of the species used.
- Site preparation requirements.
- Timing of planting and planting method.
- Liming or fertilizer requirements.
- Operation and maintenance requirements.

OPERATION AND MAINTENANCE

Field borders require careful management and maintenance for performance and longevity. The following O&M activities will be planned and applied as needed:

- Inspect and repair storm damage.
- Remove sediment from above or within the field border when accumulated sediment either alters the function of the field border or threatens the degradation of the planted species' survival.
- Shut off sprayers and raise tillage equipment to avoid damage to field borders.
- Shape and reseed border areas damaged by animals, chemicals, tillage, or equipment traffic.
- Maintain desired vegetative communities and plant vigor by liming, fertilizing, mowing, disking, or burning and controlling noxious weeds to sustain effectiveness of the border.
- Repair and reseed ephemeral gullies and rills that develop in the border.
- Minimally invasive tillage (e.g. paraplowing) may be performed in rare cases where compaction and vehicle traffic have degraded the field border function.

The purpose of the tillage is strictly to decrease bulk density and increase infiltration rates so as to provide a better media for reestablishment of vegetation and field border function.

- Maintenance activities that result in disturbance of vegetation should not be conducted during the nesting season of grass nesting birds.
- Avoid vehicle traffic when soil moisture conditions are saturated.

REFERENCES

K. G. Renard, G. R. Foster, G. A. Weesies, K. D. K. McCool and D. C. Yoder. 1997. Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE), Agricultural Handbook Number 703.

Plant Establishment Guide for Virginia, NRCS, FOTG, Section II http://efotg.sc.egov.usda.gov/treemenuFS.aspx

Revised Universal Soil Loss Equation Version 2 (RUSLE2) website (checked May 2007): http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm.