NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

FIELD BORDER

(Ac.)

CODE 386

DEFINITION

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

PURPOSE

- Reduce erosion from wind and water
- Protect soil and water quality
- Manage pest populations
- Provide wildlife food and cover
- 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 recreational land or other land uses where agronomic crops including forages are grown.

CRITERIA

General Criteria Applicable to All Purposes

Field borders shall be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on local design criteria specific to the purpose(s) for installing the practice.

The field borders shall be established to adapted species of permanent grass, legumes and/or shrubs that accomplish the design objective and do not function as host for diseases of the field crop.

Plants selected for field borders will have the physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area. Refer to Range Planting (550) and Pasture and Hayland Planting (512) for seedbed preparation, seeding rates, dates, depths, fertility requirements and planting methods. Noxious weeds in the planting area will be controlled prior to planting.

Ephemeral gullies and rills present in the planned border area will be eliminated 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 more of a sheet flow into the planned border area.

Additional Criteria to Reduce Erosion from Wind and Water

Field border establishment, in conjunction with other practices, will be timed so that the soil will be adequately protected during the critical erosion period(s).

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

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

The minimum border width to reduce wind and water erosion is 12 feet, and the minimum length is the length of

the field to be protected.

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 shall be one foot during the critical erosion period.

Water Erosion Reduction. Locate borders around the entire 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.

As closely as possible, orient plant rows 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 – Adsorbed, 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 minimum width for this purpose shall be 30 feet and have a vegetation stem density/retardance of moderate to high (e.g. 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. Border widths will be designed 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.

Mowing, harvesting, pesticide applications and other disturbance activities will be scheduled 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 (e.g. late-blooming alfalfa strips planted to lure lygus bugs out of maturing alfalfa seed). Use mechanical, cultural and/or chemical techniques to reduce pest populations in field borders, when needed.

Provide for Weed Control. When the field border is established for weed control, the minimum width is 20 feet, and the minimum length is the length of the field. If the border is planned as a travel lane, the length should be sufficient to join two fields.

Additional Criteria to Provide Wildlife Food and Cover

Establish plant species that provide wildlife food and cover for the target wildlife species. For further planning guidance, refer to habitat management guides, the Upland Wildlife Habitat Management (645) standard, Idaho Biology Technical Notes and National Biology Technical Notes for species-specific habitat requirements.

Schedule mowing, harvest, weed control and other management activities within the field border to accommodate reproduction and other life cycle requirements of target wildlife species.

Vegetative successional state shall be maintained to accommodate target wildlife species requirements.

Be aware of the potential for increased rodent populations and provide control as necessary.

When wildlife is 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. When the field border is established for general wildlife habitat, the minimum width is 20 feet, and the minimum length is the length of the field. If the border is planned as a travel lane, the length should be sufficient to join two fields.

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 SCI).

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.

Establishing a narrow strip of stiff-stemmed upright grass at the crop/field border interface can increase soil particle trapping efficiency of the field border. If bank stabilization is a concern, select fibrous deep-rooted plants.

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. Select grasses, forbs and/or legumes that provide food and cover habitat for pollinators and beneficial insects. Refer to Idaho Biology Technical Note 1: Pollinators.

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.

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

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

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 changes 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.

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.

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. The National conservation Job Sheet, Field Border (386) is available to document practice specifications. The following components shall be included for documentation:

- 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:

- 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. Avoid damage from tillage when field borders are used as turn rows at the end of fields.
- Maintain desired vegetative communities and plant vigor by proper management (lime, fertilize, mow) and by controlling noxious weeds to sustain effectiveness of the border. Do not clip, mow or burn dryland field border plantings unless part of a planned weed control or fire break program. Allow annual growth to accumulate for wildlife cover. Mow irrigated areas annually, at the time of the second cutting of hay, to allow ground-nesting juvenile birds to reach flight state.
- Repair and reseed ephemeral gullies and rills that develop in the border.
- Minimally invasive tillage (e.g. para-plowing) 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 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.

NRCS – Idaho Biology Technical Notes:
No. 1 - Pollinators

NRCS – Idaho Plant Materials Technical Notes:

No. 4 – Reading Seed Packaging Labels and Calculating Seed Mixtures

No. 10 – Pasture and Range Seedings

No. 24 – Grass, Grass-Like, Forb, Legume and Woody Species for the Intermountain West

No. 41 – Restoration and Diversification of Plant Communities with Woody Plants

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

USDA. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Carribean, and the Pacific Basin. USDA Handbook 296. http://soils.usda.gov/survey/geography/mlra/