NATURAL RESOURCES CONSERVATION SERVICE
MONTANA CONSERVATION PRACTICE SPECIFICATION

FIELD BORDER (ACRE)

CODE 386

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

PURPOSE: A field border is an essential practice for all land where agricultural crops and forages are grown to reduce water and wind erosion, protect soil and water quality, provide wildlife food and cover and pollinator habitat, increase carbon storage, and improve air quality. This practice is applied around the inside perimeter of fields and applies to cropland and grazing lands.

CONSERVATION MANAGEMENT SYSTEM

A field border is established as part of a conservation management system to address the soil, water, air, plant, animal, and human needs as related to the owner's goals and objectives. It is important to consider wind and water erosion potential, crop rotation, nutrient and pest management, wildlife habitat needs, and other supportive conservation practices when designing a field border.

PRACTICE SPECIFICATIONS

Practice specifications are provided to assure the residue management system meets the resource needs and producer's objectives. The specifications are based on the amount, timing, and orientation of crop residue left on the soil surface.

GENERAL CRITERIA APPLICABLE TO ALL PRACTICE PURPOSES

All field borders should be established around the field edges to the extent needed to meet the resource needs and objectives of the producer. The **minimum design width of a field border is 20-feet**. Adapted species of permanent grass, forbs and/or shrubs that have physical characteristics to control wind and water erosion will be selected for the field border. If ephemeral gullies or rills are present in the area planned for field borders, they will be eliminated as part of seedbed preparation and as maintenance if they appear after establishment.

All seed and planting materials shall be labeled and will comply with current Federal and Montana standards. See Field Office Technical Guide (FOTG), Section I, State/Tribal/Local Laws for the Montana Agricultural Seed Act and Administrative Rules, State of Montana Department of Agriculture.

No plant species listed on the noxious weed or regulated plant list in Montana will be used in the field border.

Use certified seed and recommended cultivars whenever available. See Montana Plant Materials Technical Note, No. 46 'Seeding Rates and Recommended Cultivars' for a list of all recommended cultivars. When certified seed is not available, common seed may be used that is adapted to local soil and climatic conditions. Seed should not be used if the origin or cultivar is unknown.

All seed must be tested and tagged in accordance with all Federal and Montana Agricultural Seed Act and Administrative Rules.

> CAUTION: Seed tests must be performed and dated within one year prior to the date of planting. See FOTG, Section I, State/Tribal/Local Laws, Ordinances, and Regulations.

The germination and purity of each species in a mixture must be listed on the seed tag, as well as the percentage of each species in the mixture, to verify adequate amounts of Pure Live Seed (PLS).

CAUTION: It is recommended to obtain separate seed tags for each species, as the percentage of weed and other crop seeds will be shown on the label. These are often not clearly identified on a seed tag for a mixture.

SEEDING RATES

Seeding rates will be calculated based on a Pure Live Seed (PLS) basis. Use tables in the Montana Plant Materials Technical Note, No. 46, 'Seeding Rates and Recommended Cultivars' to determine pounds of PLS required for a pure stand or full seeding.

For Native species, use Forage Suitability Group Descriptions located in the FOTG, Section II, to assist in species selection and production estimates for planted stands that have reached maturity.

For planting mixtures of two or more species, determine the total pounds of PLS required by multiplying the full seeding rate of each species by the percentage desired within the total mixture. Use the job sheet for step-by-step calculations.

If planting is to be completed by broadcasting the seed; (1) seeding rates must be doubled if no other operation will take place after seed broadcasting, (2) standard seeding rates may be used if the seedbed is roughened, seed is broadcast, then covered with a spike-tooth harrow or similar implement, and then rolled with a packer or culti-packer.

SEEDING DEPTH AND ROW SPACING

Plant to proper depth ensuring seed or planting material will contact soil moisture uniformly (seed to soil contact). Small grass, forbs, and legume seeds will be planted no deeper than 1/2-inch. Large grass seed will be planted no deeper than 3/4-inch. All species will be planted in 14 inches or less row spacing. Where slopes are greater than 5 percent, planting will be completed on the contour or across the general slope of the land.

SEEDBED PREPARATION

Prepare site to provide a medium that does not restrict plant emergence. Seedbed preparation should be completed that provides a firm, weed-free seedbed that eliminates seedling competition from weedy species. A seedbed is sufficiently firm when an average-sized man sinks to approximately 1/4-inch into the soil.

A seedbed preparation method should be selected that best suits the site. The selected seedbed preparation should retain the maximum amount of soil moisture.

Some planting sites require only one or two tillage operations to prepare a seedbed. Usually tillage is for the purpose of killing all weeds to eliminate competition. Using no till methods to plant species is the preferred method of establishment and should reduce wind and/or water erosion. Weeds must be controlled to ensure good stand establishment. Chemical weed control may be substituted for one or all of the tillage operations when preparing a seedbed.

PLANTING DATES AND METHODS

Planting shall be scheduled during periods when soil moisture is adequate for germination and establishment. *Spring seedings* will be completed by May 15. Seedings are allowed after May 15 *only* when there is a minimum of two feet of moist soil. The soil must also be moist to within two inches of the surface. These seedings must be completed by August 15. As a good rule of thumb, if the soil is wet enough to stick to the coulters, it is too wet to plant.

Dormant fall seedings can be made after October 15 or when soil temperatures two inches below the soil surface remains at 40° F. or less for 10 or more days.

Species with a high percentage of dormant seed such as green needlegrass and Indian ricegrass must be planted as a dormant fall seeding unless germination by standard seed test is greater than 50 percent. If dormant species are a minor component of a mixture; spring seeding is acceptable. *When irrigation is provided*, planting may be completed at any time during the growing season that allows adequate root system development prior to a killing frost (45 days).

When planting on previously cropped land, the kinds of residual herbicides used in the cropping system the last several years must be considered to prevent planting failures.

FERTILIZER

Fertilizer and soil amendment recommendations shall be based on results from a current soil test. Application shall be appropriately placed and timed to be effective. Legume seed shall be inoculated with the proper species of viable *Rhizobia* before planting. If using coated seed, recalibrate the planting equipment to deliver the same number of seed per area as would be applied with non-coated seed.

High levels of nitrogen fertilizer broadcast before seeding may promote weed growth more than it aids the establishment of grass. Where soil tests indicate low nitrogen levels, additional nitrogen needed to promote high levels of production should be top dressed after stand establishment.

COMPANION CROPS

Irrigated companion crops may be used at full or reduced rates and harvested for forage or grain. Irrigation will be applied to meet the needs of the seeding.

Under dryland conditions companion crops are not recommended for establishing pasture or hayland where annual precipitation is less than 16 inches. In areas where annual precipitation is 16 inches or greater, and where erosion is a concern, a spring grain companion crop may be seeded at the following rates:

Spring wheat	10 lbs./acre (3.3 seeds/ft.)
Barley	10 lbs./acre (3.0 seeds/ft.)
Oats	10 lbs./acre (3.3 seeds/ft.)

Companion crops are best removed early as hay or silage leaving a tall stubble (6-8 inches) for snow trapping. When grass and/or legumes are seeded with the companion, crop seeding depth will not exceed one inch.

The presence of weed populations—especially noxious weeds—will impact seedbed preparations. Each field should be evaluated for weed populations. Seeding on fields with significant weed populations will be delayed until weeds are controlled mechanically or chemically with labeled herbicides. Refer to guidelines in FOTG, Section IV, Practice Standard and Specification, Pest Management (Code 595), and *Montana, Utah, Wyoming Weed Management Handbook*. During this period a protective cover crop may need to be planted to control erosion prior to planting.

CRITERIA APPLICABLE TO SPECIFIC PRACTICE PURPOSES

Reduce Erosion from Wind and Water - When erosion is a concern, field border establishment should be timed so the soil surface is protected during critical erosion periods. For wind erosion, stiff-stemmed, upright growing vegetation should be used to trap saltating soil particles. If the border is not designed to go all the way around the field the upwind edge of the field should be designed to provide a stable area determined by the prevailing wind erosion direction (using WEPS).

Where water erosion is a concern, field borders should be located around the entire perimeter of the field installed to eliminate sloping end rows, headlands, and other areas where concentrated flow will enter or leave the field. Orient plant rows as closely as possible to perpendicular to sheet flow direction.

Protect Soil and Water Quality - Where water quality is a concern, field borders will not be burned as part of maintenance, but should be properly clipped, mowed, or grazed to ensure effectiveness. Field borders must be a **minimum width of 30 feet with moderate to high stem density when adsorbed, dissolved, or suspended contaminants are an issue.** As a minimum locate field borders along the edge(s) of the field where runoff enters or leaves the field. When manure or pesticide applications are planned, all applicable, state, local and tribal setbacks must be followed.

Provide Wildlife Food and Cover and Pollinator Habitat - Where wildlife habitat is a concern**,** select species that provide adequate habitat food or cover for the wildlife species of interest. The minimum width shall be 30 feet. Schedule mowing, harvest, weed control and other management activities to accommodate nesting and other requirements of the target species. Avoid vehicle traffic in the field border. The border can also be established to attract beneficial organisms that prey on target pests. Maintain optimal vegetative successional state to accommodate target wildlife species requirements.

Determine appropriate food and cover species from the FOTG, Section IV, practice specification, Upland Wildlife Habitat Management (Code 645).

Select species for pollinator habitat from Montana Biology Technical Note, MT-20, "Habitat Development for Pollinator Insects".

Increase Carbon Storage - Establish plant species that will produce adequate above- and below-ground biomass, maximize the width and length of the border to increase total biomass production. Do not burn or disturb the roots of the established vegetation with tillage.

Improve Air quality - Select plants with persistent roots and residue that stabilize soil and plants that can withstand equipment traffic. Establish plant species that optimize interception and adhesion of airborne particles. Do not burn.

CONSIDERATION APPLICABLE TO ALL PRACTICE PURPOSES

Design borders to comply with applicable Montana state and local regulations regarding manure and pesticide application setbacks.

Consider planting field borders around entire field.

Consider diverse native plant mixes for wildlife and pollinator habitat and to provide diverse pollen and nectar sources. Native perennial species provide a longer period of protection than annual species.

When selecting plant species consider; the plant's tolerance to sediment depositions and chemicals planned to be applied, drought tolerance, ability to withstand equipment traffic.

Establishing a narrow strip of stiff-stemmed upright grass at edge of crop field increases soil particle trapping efficiency.

Organic producers may need to submit plans for approval prior to planting as part of their Organic System Plan.

Prescribed burning, prescribed grazing, strip disking, or selective herbicide applications are management tools to maintain habitat for wildlife and pollinators, provided they do not compromise the purpose(s) of the practice.

Drive machinery only when necessary, at low speed and with implements fully raised to reduce wildlife mortality. Avoid using field borders during the primary nesting season.

CONSIDERATION APPLICABLE FOR ORGANIC SYSTEMS - If genetic drift is a concern, use buffer vegetation to reduce potential of cross pollination.

PLANS AND SPECIFICATIONS

Prepare plans and specifications according to criteria in standard and include the following components:

- Field border widths and lengths **with measured acres,** location in field(s), species to be used.
- Species to be used, the location, planting density **and percent of mixture and seeding rate (PLS)** of all species used.
- Site preparation requirements.
- Timing of planting and planting method.
- Fertilizer requirements.
- Operation and maintenance requirements.
- **Job Class**
- **Before/after erosion predictions (if applicable)**
- **Current seed analysis tag with seed source, percent germination and purity for all species**
- **The field border job sheet (MT386-JS).**

OPERATION AND MAINTENANCE

- Remove sediment when accumulated sediment either reaches six inches of height or alters the function of the field border or causes degradation of the planted species.
- Raise tillage equipment and shut off sprayers to avoid damage to field borders and reseed damaged areas as needed.
- Maintain plant species vigor by fertilizing, mowing, disking or burning, and controlling noxious and invasive species to sustain effectiveness of field border.
- Maintenance activities that disturb vegetation should not be conducted during the **primary nesting season (April 15 - August 1)**, and fawning and nesting season.
- Avoid vehicle traffic especially when soil moisture conditions are saturated.
- Maintain records of the field border maintenance as needed by the land user.
- Maintain herbaceous vegetation so that it provides at least 80 percent ground cover throughout the year.