NATURAL RESOURCES CONSERVATION SERVICE
MONTANA CONSERVATION PRACTICE STANDARD

STRIPCROPPING (ACRE)

CODE 585

DEFINITION

Growing row crops, forages, small grains, or fallow in a systematic arrangement of equal width strips across a field.

PURPOSES

- Reduce soil erosion from water and transport of sediment and other water-borne contaminants
- Reduce soil erosion from wind
- Protect growing crops from damage by wind-borne soil particles

CONDITIONS WHERE PRACTICE APPLIES

This practice applies on cropland or other land where crops are grown.

CRITERIA

General Criteria Applicable To All Purposes

Number of Strips. A stripcropping system shall consist of two or more strips.

Alignment of Tillage and Planting Operations. All tillage and planting operations will follow the strip line established.

Vegetative Cover. Vegetation in a stripcropping arrangement consists of crops and/or forages grown in a planned rotation.

No two adjacent strips shall be in an erosion-susceptible condition at the same time during the year. However, two adjacent strips may be in erosion-resistant cover at the same time.

Erosion-resistant strips shall be crops or crop residues that provide the needed protective cover during those periods when erosion is expected to occur.

Acceptable protective cover includes a growing crop, including grasses, legumes, or grass-legume mixtures, standing stubble, residue with enough surface cover to provide protection, or surface roughness sufficient to provide protection.

A vegetative cover shall be selected that is tolerant of the anticipated depth of sediment deposition.

When the erosion-resistant strip is in permanent vegetation, the species established shall either be tolerant to herbicides used on the cropped strips or protected from damage by herbicides used on the cropped strips.

Width of Strips. The required width of strips shall be determined using currently approved erosion prediction technologies to achieve the planned erosion reduction.

Additional Criteria To Reduce Soil Erosion From Water and Transport Of Sediment And Other Water-borne Contaminants

Alignment of Strips. Strip boundaries shall run parallel to each other and as close to the contour as practical.

Strip Width. Base strip widths on the planning objective and the approved erosion prediction technology. Erosion-susceptible strip widths shall not exceed:

- 50 percent of the slope length used for erosion prediction or 150 feet whichever is less where 10-year EI storm values exceed 30.

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

Note: This type of font **(AaBbCcDdEe 123…)** indicates NRCS National Standards.
This type of font (AaBbCcDdEe 123…) indicates Montana Supplement.

- 50 percent of the slope length used for erosion prediction or 250 feet whichever is less where 10-year EI storms are equal to or less than 30.

The erosion-resistant and erosion-susceptible strips shall be of approximately equal width. If a correction strip is required, that strip may vary in width but shall be no narrower than the widest working field implement used to traverse the strip.

Where field contours become too sharp to keep machinery aligned with the contour during field operations, establish sod turn-strips on sharp ridge points. These strips shall be wide enough to allow the equipment to be lifted and/or turned and meet the same rows across the turn strip.

Arrangement and Vegetative Condition of Strips. Strips susceptible to erosion shall be alternated down the slope with strips of erosion-resistant cover. Erosion-susceptible strips are generally defined as consisting of row crops or fallow with less than 10 percent surface residue cover and little surface roughness during the period of time when erosion potential is the greatest. An erosion-resistant strip generally consists of dense grasses and/or legumes, hay crops nearing the end of the first year, or row crops with surface cover greater than 75 percent during the period of time when erosion potential is the greatest. In conditions where little surface cover is present, surface roughness will be considered erosion resistant if roughness depressions are at least 7 inches in depth during the period of time when erosion potential is the greatest.

Minimum Row Grade. Row grades for soils with slow to very slow infiltration rates (soil hydrologic groups C or D), or for crops sensitive to ponded water conditions for periods of less than 48 hours, shall be designed with positive row drainage of not less than 0.2 percent on slopes where ponding is a concern.

Maximum Row Grade. The row grade shall be aligned as closely as possible to the contour to achieve the greatest erosion reduction, but still be practicable to operate equipment.

The maximum grade of rows shall not exceed 5 percent or 0.50 times the up and down hill slope percent used for erosion prediction, whichever is less (see Considerations specific to erosion by water).

Minimum Ridge Height. The ridge height shall be sufficient to reduce soil erosion compared to rows oriented up and down the slope. As a minimum, this practice shall create at least a 0.5 to 2-inch ridge height during the period of the rotation that is most vulnerable to soil erosion. The required ridge height will be determined using on-site conditions and current erosion prediction technology.

The minimum ridge height is not required for strips of close-grown crops, such as small grains or meadow.

The minimum ridge height is not required where the practice *residue management, no-till/strip-till* is used parallel with the strip boundaries if at least 50 percent surface residue is present between the rows after planting.

Critical Slope Length. The computation of critical slope length shall be determined using approved water erosion prediction technology.

When *stripcropping* is applied in conjunction with *contour farming*, the critical slope length is 1.5 times the critical slope length determined for *contour farming*.

A stripcropping layout shall not occur on a slope longer than the critical slope length unless supported by other practices that reduce slope length below critical (e.g., diversions, terraces).

Stable Outlets. Stable outlets shall be established as necessary where runoff results in concentrated flow erosion. Acceptable stable outlets include *grassed waterways, field borders, filter strips, water and sediment control basins*, or *underground outlets* for *terraces and diversions*.

Headlands/End Rows. On fields where row crops and tillage are a part of the rotation, headlands/end rows with a slope steeper than the maximum allowable row grade for that field shall be maintained in permanent sod or planted using *residue management, no-till/strip-till*.

Additional Criteria To Reduce Soil Erosion From Wind

Alignment of Strips. Strip boundaries shall run parallel to each other.

Orientation and Width of Strips. Strips shall be oriented as close to perpendicular to the prevailing wind erosion direction as practical.

The width of strips shall be determined using the currently approved wind erosion prediction technology. Calculation shall account for the effects of other practices in the conservation management system.

The effective width of strips shall be measured along the prevailing wind erosion direction for those periods when wind erosion is expected to occur and for which the system is designed.

When the orientation of erosion-susceptible strips deviates from perpendicular to the prevailing wind erosion direction, the width of these strips shall be correspondingly reduced as per direction given in Wind Erosion section of the National Agronomy Manual.

Additional Criteria To Protect Growing Crops From Damage By Wind-borne Soil Particles

Alignment of Strips. Strip boundaries shall run parallel to each other.

Orientation and Width of Strips. Strips shall be oriented as close to perpendicular to the prevailing wind erosion direction as practical.

The effective width shall be measured along the prevailing wind erosion direction during those periods when sensitive crops are susceptible to damage by wind-borne soil particles.

The width of strips shall not exceed the width permitted by the crop tolerance to wind erosion during specific crop stage periods, as specified in the National Agronomy Manual, other accepted technical references, or other planned crop protection objectives.

CONSIDERATIONS

Off-site transport of sediment and sediment-borne contaminants is reduced by this practice.

Stripcropping may need to be used in combination with other conservation practices to meet the goals of the resource management system.

Strip widths may be adjusted, within the limits of the criteria above, to accommodate widths of farm equipment to minimize partial or incomplete passes.

Design and install the strip layout to best facilitate operation of machinery used on the strips. To avoid point rows and partial machine passes, lay out strip widths to have some multiple of full width passes of seeding implements or sprayers.

The *conservation crop rotation* on stripcropped fields should be consistent with the farm enterprise crop mix and/or associated livestock operation. These will influence the proportion of row crops, close growing crops, and meadow crops.

To avoid wide fluctuations in acreage of different crops from year to year, fields having identical crop rotations can be set up that are nearly equal in size and have offset years of rotation commencement. The number of fields needed to produce a nearly constant acreage of each crop for each year in the rotation is equal to one half of the years in the rotation. Even-year rotation lengths are preferable to odd-year rotation lengths for ease of design.

Considerations Specific To Erosion by Water

The effectiveness of this practice is maximized when the strips are as close as possible to the contour.

Prior to design and layout, *obstruction removal* or changes in field boundaries or shape should be considered, where feasible, to improve the effectiveness of the practice and the ease of performing field operations across the slope.

Prior to layout, inspect the field to find key points for commencing layout or getting a full strip width to pass by an obstruction or ridge saddle. Whenever possible, run the strip boundary parallel with fence lines or other barriers, as long as row gradient criteria are met. Account for access road widths when they must cross the field, and adjust the strip boundary on either side accordingly.

When this practice is used in combination with *diversions* or *terraces*, coordinate the strip layout with the diversion or terrace grade and spacing so that strip boundaries will parallel terraces wherever possible within the criteria for row grade. Where grass-back or narrow-base terraces are used, allow for the uncropped width along the terrace so that the same strip width is maintained for all strips in the field.

Retaining as much crop residue as possible on the soil surface by using residue management practices can maximize critical slope lengths. Certain tillage practices, such as uphill plowing and deep tillage with heavy implements, can also be used to increase random roughness, allowing deposition to occur in depressions between soil clods and increase critical slope length. However, if the most erosion-susceptible strips of the field are kept very rough, in high ridges, or under heavy residue most of the year, there is little need for stripcropping as an erosion and sediment control practice. Little sediment will be delivered to the protective cover strips.

Wildlife benefits will be enhanced by delaying mowing on sod turn-strips and *grassed waterways* until after the nesting season.

Considerations Specific To Erosion By Wind

The effectiveness of this practice is maximized when the strips are oriented as close to perpendicular as possible to the prevailing wind erosion direction for the period for which the system is designed.

Alternative practices that may be used to separate erosion-susceptible strips include *cross wind ridges, herbaceous wind barriers*, or *windbreak/shelterbelt establishment*.

PLANS AND SPECIFICATIONS

Specifications for installation and maintenance of Stripcropping shall be prepared for each field or treatment unit according to the Criteria described in this standard.

Specifications shall be recorded on specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

A stripcropping establishment plan shall include the following information:

1. **Location map - field numbers and a map or sketch of the area to be established.**
2. **Measured acres.**
3. **Date implementation is scheduled and applied.**
4. **Before and after soil loss prediction documentation.**
5. **Soil map unit information.**
6. **Amount (percent) of soil surface cover required to meet objectives.**
7. **Design strip width, vegetative cover, minimum and maximum row grades.**
8. **Placement of stable outlets.**
9. **The stripcropping specification and jobsheet.**
10. **Specifications of other applicable standards where required for establishment of this practice (i.e. grassed waterway, stable outlet, etc.).**

OPERATION AND MAINTENANCE

Sediment accumulations along strip edges shall be smoothed or removed and distributed over the field as necessary to maintain practice effectiveness.

When headlands are in permanent cover, renovate as needed to keep ground cover above 65 percent. No-till renovation of headlands is recommended but in any case should only include the immediate seedbed preparation and reseeding to a sod-forming crop with or without a nurse crop. Maintain full headland width to allow turning of farm implements at the end of a tilled strip to double back on the same strip.

Operation and Maintenance Specific To Erosion By Water

Conduct all farming operations parallel to the strip boundaries except on end rows that have gradients flatter than the criteria set forth in this standard or where the end rows have at least 75 percent residue cover.

Plant correction areas as closely as possible to the contour. Using no-till in the correction areas or seeding close-grown crops rather than row crops increases options.

Mow sod turn-strips and *grassed waterways* at least once a year. Harvesting is optional.

Operation and Maintenance Specific To Erosion By Wind

Erosion-resistant strips in rotation shall be managed to maintain the planned vegetative cover and surface roughness during periods when wind erosion is expected to occur. The

protective cover must be adequate to inhibit the initiation of wind erosion and the surface roughness will be sufficient to trap saltating soil particles originating upwind.

REFERENCES

Cropland Cover-Management Conditions, Chapter 6, Table 6-4. In *Predicting Soil Erosion by Water, A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE). 1997.* USDA Agricultural Research Service, Agricultural Handbook No. 703].