

Natural Resources Conservation Service
Conservation Practice Standard

CONTOUR BUFFER STRIPS
(Ac.)
CODE 332

DEFINITION

Narrow strip of perennial, herbaceous vegetative cover established across the slope and altered down the slope with wider cropped strips.

PURPOSE

- To reduce sheet and rill erosion.
- To reduce transport of sediment and other water-borne contaminants down slope, on site and off -site.
- To enhance upland wildlife habitat.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies on cropland. It is most suitable on uniform slopes ranging from 2 to 8 percent with slope lengths \leq the Critical Slope Length (Critical Slope Length = length of slope above which the practice losses its effectiveness), in areas of the state where rainfall intensity are low to moderate (10 year $EI \leq 140$). EI = storm energy * intensity.

This practice is not suited to fields with extremely long slopes whose length exceeds the critical slope length for contouring by more than 1.5 times, unless the field slope length is shortened by the installation of other practices (e.g. terraces).

This practice is unsuitable on undulating to rolling topography because of the difficulty of maintaining parallel strip boundaries across the hill slope or staying within row grade limits.

The narrow strips of permanent vegetative cover are not a part of the normal crop rotation.

This standard does not apply to situations where the width of the buffer strips will be equal to or exceed the width of the adjoining crop strips.

CRITERIA

General

No plants listed in the noxious weed list of Mississippi will be established in a buffer strip cropping system.

Additional Criteria to Reduce Sheet and Rill Erosion.

Row grade, strip boundaries, and baselines. The grade of the cropped strip shall be aligned as close as possible to the contour to achieve the greatest erosion reduction possible. The maximum grade of rows within the crop strips shall not exceed $\frac{1}{2}$ of the up and down hill field slope or 2 percent, whichever is less.

For crops sensitive to ponded water for periods less than 48 hours, design a positive row grade of not less than 0.5 percent from the top of the hill or ridge toward a stable outlet.

Up to 3 percent row grade is allowed for a maximum of 150 feet as crop rows approach a stable outlet.

The grade along the up slope side of the vegetative buffer shall be the same as for the cropped strip directly above it.

When the grade of any crop strip reaches the maximum allowable design grade, a new base line shall be established up or down slope from the last buffer strip and used for the layout of the next crop strip.

Stable outlets. Surface flow from contoured crop rows must go to a stable outlet. Stable outlets include grassed waterways, underground outlets for terraces and diversions, water and sediment control basins, field boarders, headlands or end rows, or similarly stabilized areas.

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

Arrangement of strips. Cropped strips shall be alternated with buffer strips down the hill slope. Normally, a crop strip will occupy the area at the top of the hill.

When used in combination with terraces, the layout of buffer strips shall be coordinated with the grade and spacing of the terraces so that the strip boundaries will parallel terraces wherever possible. The terrace channel shall occupy the buffer strip location or lie immediately below the last buffer strip.

Width of strips. The buffer strips shall be of equal width, except when a varying width buffer strip is needed to keep either a cropped strip adjacent to it of uniform width or to maintain the strip boundary grades within the criteria set above. Width of buffer strips at their narrowest point shall be no less than 15 feet for grasses or grass-legume mixtures and no less than 30 feet when legumes are used alone.

Cropped strip width shall be of uniform width between buffer strips and not exceed 50 percent of either the slope length (L), used for erosion calculation, or the critical slope length for strip cropping, whichever is least, determine by using RUSLE (Revised Universal Soil Loss Equation).

Vegetation. Vegetation grown on buffer strips shall consist of permanent grasses, legumes, or grass-legume mixtures adapted to the site, and tolerant to the anticipated depth of sediment deposition. Critical area stabilization standard will be used to establish vegetation.

The buffer strips shall have a Vegetative Cover-Management Condition of 1 or 2 that provides protective cover and induces sediment deposition during periods when erosion is expected to occur on the cropped strips. Cropped strips will normally be expected to have a Cover-Management Condition 3 through 7. (Cover Management Conditions are described in the Revised Universal Soil Loss Equation "RUSLE").

The stem density for grass species shall be greater than 50, and for legumes, greater than 30 per square foot.

Critical slope length. The critical slope length for buffer strip cropping is 1.5 times the critical

slope length determined for contour farming as determined using approved erosion prediction technology (RUSLE).

Headlands or end rows. On fields where row crops are a part of the rotation, keep headlands or end rows in permanent sod if their row grade would be steeper than the designed grade of the crop strip.

Level of erosion control. The level of erosion control achieved by the buffer strip cropping standard shall meet or exceed the soil erosion level specified by the conservation plan objective. It shall be determined by using RUSLE, accounting for the impact of other conservation practices in the system.

Additional Criteria to Reduce the Transport of Sediment and Other Water-Borne Contaminants Down Slope

Vegetation. Buffer strips shall be established using permanent grass vegetation.

On sloping cropland exceeding 3 percent, the design shall be based on the minimum criteria given above to reduce sheet and rill erosion. On slopes 3 percent or flatter, the width of the buffer shall be 15 feet or wider.

The maximum width between buffer strips shall be 100 feet or (½) half of the field slope length, whichever is smaller. This width may be adjusted to account for equipment width.

Arrangement of strips. Buffer strips and crop strips will be alternated down the hill slope. A buffer strip will be established at the bottom of strips (one cultivated and one buffer) to pass by an obstruction or ridge saddle. Whenever possible to stay within grade limits, run strip boundaries parallel with fence lines or other barriers. Account for uncropped access roads widths when they must traverse the field by adjusting strip boundaries on both sides accordingly.

When the slope length exceed the critical slope length for the cover-management condition that best characterizes the field to be contour buffer stripped, establish structures, such as terraces, to reduce the slope length below critical if the soil loss objective is not reached.

Critical slope length can be increased by, retaining crop residue on the soil surface of the cultivated strips using crop residue management practices. Certain tillage practices can also be used on the cultivated strips to increase random roughness to cause deposition to occur in depressions between soil clods. However, if the cropped strips are kept very rough, in high ridges, or under heavy residue cover, the need for conservation buffer strips as an erosion and sediment reduction practice will be reduced since less sediment will be delivered to them.

Additional Criteria to Enhance Upland Wildlife Habitat

Vegetation. To enhance wildlife habitat, mow the buffer strips every other year. The residue cover provides early and late season nesting and escape cover for many species of wildlife displaced from other mowed areas. Mow in July to allow for regrowth before the growing season ends.

Use permanent grasses, legumes, or grass-legume mixtures that are suitable to the site. Native warm season grass species are recommended for wildlife purposes.

Some weedy growth may be allowed in the strip as they provide an insect source for young birds.

PLANS AND SPECIFICATIONS

Specification for installation, operation, and maintenance of Contour Buffer Strips shall be prepared for each field according to the Criteria, Considerations, and Operations and Maintenance described in this standard, and shall be recorded on specification sheets, job sheets, or narrative statements in the conservation plans.

OPERATION AND MAINTENANCE

Conduct all farming operations parallel to the strip boundaries except on end rows with gradients less than the criteria set fourth in this standard.

Time mowing of buffer strips to maintain appropriate vegetative density and height for optimum trapping of sediment from the uphill slope cropped strip during the critical erosion

period(s). Mowing should be delayed until after ground-nesting birds have hatched, usually after July.

Apply lime and fertilizer to buffer strips according to the Nutrient Management standard (Code 590).

Where contour row curvature becomes too sharp to keep equipment aligned with rows during field operations, establish sod turn strips on sharp ridge points. In drainageways, establish grassed waterways at least to the point of sharp curvature. 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.

Mow sod turn strips and waterways at least annually.

Spot seed or totally renovate buffer strip systems damaged by herbicide application after residual action of the herbicide is complete.

Redistribute sediment accumulations along the upslope edge of the buffer-crop strip interface upslope over the cultivated strip when needed to maintain uniform sheet flow along the buffer/cropped strip boundary. If sediment accumulates just below the upslope edge of the buffer strip to a depth of 6 inches or vegetative ground cover falls below 65 percent in the buffer strip, relocate the buffer/cropped strip interface location. Cultivated strips and buffer strips shall be rotated so that a mature stand of protective cover is achieved in a newly established buffer strip immediately below or above the old buffer strip before removing the old buffer to plant an erosion-prone crop. Alternate repositioning of buffer strips to maintain their position on hill slope.

Renovate vegetated headlands or end row areas as needed to keep ground cover above 65 percent. Renovation shall only include the immediate seedbed preparation and reseeding to a sod-forming crop with or without a nurse crop. Maintain full headland or end row width to allow farm implements room to double back on the same strip.

**Slope Length Limits for Contour
Buffer Strips**

<u>Land Slope</u>	<u>Maximum Length 1/</u>
Percent	Feet
1 to 2	800
2.1 to 5	400
5.1 to 8	200
8.1 to 12	125

1/ Maximum length of slope for contour farming to be effective without a water disposal system. These are maximum lengths for uniform (smooth and without irregularities) fields and depend on soil properties, management, and storm characteristics.

REFERENCES

Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE), Agricultural Handbook Number 703