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KANSAS AGRONOMY TECHNICAL NOTE KS-34

Subject: Designing Contour Buffer Strips

Designing Contour Buffer Strips

The conservation practice standard for "Contour Buffer Strips" outlines three different criteria where this practice applies:

- To reduce sheet and rill erosion
- To reduce the transport of sediment and other water-borne contaminants downslope
- To enhance wildlife habitat

Determining the appropriate criteria to be used will change the design requirements of this practice considerably. For example, to reduce sheet and rill erosion the planner must know:

- The soil hydrologic group
- Ten year EI
- Percent slope
- Critical slope length
- Slope length used in erosion prediction
- Cover management type
- Intended contouring grade
- Equipment to be used
- Cover to be used in the vegetated strip.

To reduce the transport of sediment and other water-borne contaminants downslope the planner must know:

- Whether the slope is 3 percent or greater
- Equipment to be used

(over)

DIST: A, F, PMC, RC&D, NPR, RTT(R), RTT(W), FSA, S(RC)

To Enhance Wildlife Habitat

- Equipment to be used
- Habitat desired

Designs for wildlife habitat may not require control of sheet and rill erosion criteria if suitable erosion control practices are already implemented. When designing contour buffer strips for a field requiring consideration of more than one criteria, the most limiting crop strip width will be used.

The standard refers to three terms that can be easily confused:

Critical slope length: This is the point on the slope that the contouring practice is no longer effective. For erosion control, the contour buffer strip is dependent on the contouring practice.

Slope length: This is the horizontal distance from the origin of overland flow to the point where either (1) the slope gradient decreases enough that deposition begins or (2) runoff becomes concentrated in a defined channel. Surface runoff will usually concentrate in less than 400 feet and is a practical slope length limit.

Hillslope: This refers to the overall grade of the field or hill. This term is not used in calculating soil loss.

Calculating soil loss:
C factor: This is a weighted value. The C factor for the grass strip is calculated. Then a C factor for the cropped area between the strips is calculated. The overall C factor is figured by multiplying each of the C factors by the percentage of the hillslope with each cover condition and adding the results.

LS factor: Slope length is best determined in the field. Slope lengths estimated from contour maps are usually too long since the detail to determine concentrated flow or deposition is not represented. This factor will remain the same as the "before condition" since deposition is accounted for in the adjustment to the "P" factor.

P factor: This factor indicates the modification of the flow pattern, grade or direction of surface runoff and by reducing the amount and rate of runoff. Until full implementation of RUSLE, use 0.7 as the adjustment to P for the application of a contour buffer strip. This will be combined with the contouring adjustment as determined for the P factor tables.

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Designing the Row Grade:
Align the grade of the cropped strip as close to contour as possible to achieve the greatest erosion reduction possible. The maximum in-row grade will not exceed 2 percent. Up to 3 percent row grade is allowed for a maximum of 150 feet into a stable outlet.

The crop strip should be parallel to the upslope border of the vegetated strip, adjustments for alignment and farmability should be made to the downslope border of the vegetated strip.

Outlets are needed to provide stable areas for runoff since the strips will have some affect on the flow of runoff from the field. Plan outlets and field borders as necessary.

Determining Width of Strips
The width of the vegetative strip will be no less than 20 feet at its narrowest point for grass and legume mixtures and no less than 30 feet when legumes are used alone.

The crop strip width will not exceed either 50 percent of the slope length used to calculate erosion prediction or exceed the maximum crop width from Table 1 in the Kansas standard, whichever is least.

If the maximum hillslope is longer than listed in Table 1, consideration of other water management structures should be considered.

Designing for water quality and reducing the transport of sediment and other water-borne contaminants downslope:

Strip Width:
On slopes exceeding 3 percent use the same method as used for reducing sheet and rill erosion. On slopes less than 3 percent, the cropped strip will not exceed 100 feet or one half of the slope length, whichever is least.

A vegetative strip equal to 2 times the width of the other strips will be established at the bottom of the hillslope or a minimum width of 40 feet.

Designing to Enhance Wildlife Habitat.
This criteria may or may not be a consideration when designing for erosion control or water quality practices. However, if this is the only criteria, positioning of the strips would be designed to enhance nesting cover, travel lanes and escape cover.

Vegetation would be selected to enhance food and cover for target species. They may include woody vegetation as well as grass and legume species.

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Strip Width
It is recommended that 50 feet is the minimum desirable width to prevent the vegetative strip from becoming a predation alley. The minimum strip width in the standard is 30 feet.

If not needed to reduce sheet and rill erosion, the cropped width is at the discretion of the planner and meet the producers objectives, but will not exceed 300 feet. However, they will be designed to enhance farmability by paralleling the crop strip to the upslope border of the vegetative strip as stated above.

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