Chapter 3b Contour Buffer Strips

Definition of contour buffer strips

Contour buffer strips are narrow strips of permanent, herbaceous vegetative cover established across the slope and alternated down the slope with wider cropped strips (fig. 3b–1).

Contour buffer strips are most suitable on slopes ranging from 4 to 8 percent where slope lengths are less than the critical slope length beyond which contouring loses its effectiveness. Critical slope length is determined by using the Revised Universal Soil Loss equation (RUSLE) or other approved erosion prediction technology.

The practice is not suited to long slopes where lengths exceed critical slope length by more than 1.5 times unless other practices, such as terraces or diversions, are installed to intercept the flow.

Contour buffer strips are more effective in trapping sediment and filtering pollutants and less likely to fail in areas where storm energy intensities are low to moderate and where 10-year erosion index (EI) values as used in RUSLE are less than 140.

Purpose of contour buffer strips

This practice has two primary purposes for which it can be designed and installed:

- to reduce sheet and rill erosion
- to reduce transport of sediment and other waterborne contaminants downslope, onsite, or offsite

In addition to these primary purposes, the practice may also enhance wildlife habitat.

Design considerations

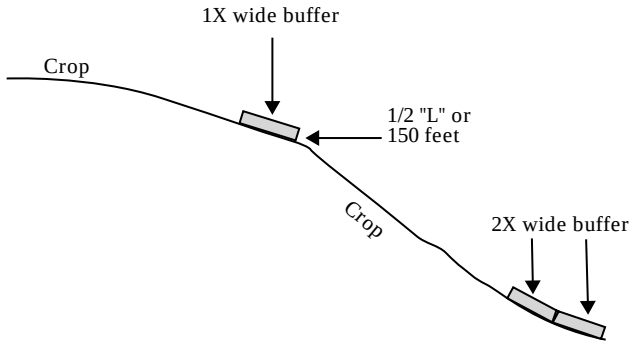
Location and layout

Buffer strip width
The actual width of the contour buffer strip is determined by the purpose or purposes identified, the type of vegetation to be established, and its effectiveness. Where more than one purpose is being served, the most restrictive criteria governs.

Minimum widths for various purposes and types of vegetation are stated in the contour buffer strip practice standard for your area. Generally, contour buffer strips are a minimum of 15 feet wide for grasses or grass legume mixtures and 30 feet for legumes alone. Experience has shown that by increasing the minimum width to 20 feet, flow velociy through the buffer is reduced even further thus reducing the risk of erosion immediately below the buffer.

Width of cultivated strips
Since contour buffer strips are established in conjunction with contour cropped strips, the spacing between buffer strips is determined by the purpose(s) being served and the criteria stated in the practice standard.

Figure 3b–1 Typical slope with contour buffer strips designed to reduce contaminants



Generally, for erosion control the criterium is the lesser of half the predominant downhill slope length or half the critical slope length for contour strip cropping as determined using RUSLE or other approved erosion prediction technology. Critical slope lengths can be increased by increasing residue cover or roughness, which changes the vegetative cover management conditions of the cropped strip.

The criterium for reducing sediment or other water-borne contaminants is generally the lesser of half the predominant downhill slope length or 150 feet (fig. 3b–1). To determine the minimum width of cultivated strips, some preliminary slope information must be collected in the field and run through RUSLE. Additionally, equipment must fit well with contour buffer strips. Not only must the strips be parallel, but they must also be planned on multiples of the working width of equipment, typically, the planter or drill used to plant the crops. This adjustment will prevent encroachment into the buffer strip or the planting of point rows. Tables 3b–1 through 3b–4 show strip widths for various planter and drill widths and row spacing.

For example, if common planting equipment is six 30-inch rows, the working width of each pass is 15 feet. If half of the downhill slope length is 125 feet, the appropriate spacing would be adjusted downward to 120 feet or eight passes (four rounds) with the 15-foot-wide 6-row planter.

Strip width is not as much of an issue with drilled or broadcast seeding methods. If other crops, such as small grains or drilled soybeans, are planted in the rotation, a spacing of 120 feet fits multiple passes of 8-, 10-, 12-, 15-, 20-, 24-, and 30-foot wide drills.

Consideration must also be given to use of other equipment, such as sprayers. For example, a sprayer with a 60-foot boom can be successfully used on a 120-foot-wide strip by making two passes or on a 90-foot strip by making one full pass and then a half pass with half of the boom shut off to avoid overlap and spraying the buffer strip.

Table 3b–1 Strip width adjustments for planters on 30-inch rows

# of passes	4 row		6 row		8 row		12 row	
	# of rows	width ft	# of rows	width ft	# of rows	width ft	# of rows	width ft
1	4	10	6	15	8	20	12	30
2	8	20	12	30	16	40	24	60
3	12	30	18	45	24	60	36	90
4	16	40	24	60	32	80	48	120
5	20	50	30	75	40	100	60	150
6	24	60	36	90	48	120	72	180
7	28	70	42	105	56	140	84	210
8	32	80	48	120	64	160	96	240
9	36	90	54	135	72	180		
10	40	100	60	150	80	200		
11	44	110	66	165	88	220		
12	48	120	72	180	96	240		
13	52	130	78	195				
14	56	140	84	210				
15	60	150	90	225				
16	64	160						
17	68	170						
18	72	180						
19	76	190						
20	80	200						
21	84	210						
22	88	220						
23	92	230						

Table 3b–2 Strip width adjustments for planters on 20-inch rows

# of passes	4 row # of rows	4 row width ft	6 row # of rows	6 row width ft	8 row # of rows	8 row width ft	12 row # of rows	12 row width ft
1	4	6.67	6	10	8	13.33	12	20
2	8	13.34	12	20	16	26.66	24	40
3	12	20.01	18	30	24	39.99	36	60
4	16	26.68	24	40	32	53.32	48	80
5	20	33.35	30	50	40	66.65	60	100
6	24	40.02	36	60	48	79.98	72	120
7	28	46.69	42	70	56	93.31	84	140
8	32	53.36	48	80	64	106.64	96	160
9	36	60.03	54	90	72	119.97		
10	40	66.70	60	100	80	133.30		
11	44	73.37	66	110	88	146.63		
12	48	80.04	72	120	96	159.96		
13	52	86.71	78	130				
14	56	93.38	84	140				
15	60	100.05	90	150				
16	64	106.72	96	160				
17	68	113.39						
18	72	120.06						
19	76	126.73						
20	80	133.40						
21	84	140.07						
22	88	146.74						
23	92	153.41						
24	96	160.08						
25	100	166.75						

Table 3b–3 Strip width adjustments for planters on 38-inch rows

# of passes	4 row # of rows	4 row width ft	6 row # of rows	6 row width ft	8 row # of rows	8 row width ft	12 row # of rows	12 row width ft
1	4	12.67	6	19	8	25.33	12	38
2	8	25.34	12	38	16	50.66	24	76
3	12	38.01	18	57	24	75.99	36	114
4	16	50.68	24	76	32	101.32	48	152
5	20	63.35	30	95	40	126.65	60	190
6	24	76.02	36	114	48	151.98	72	228
7	28	88.69	42	133	56	177.31	84	266
8	32	101.36	48	152	64	202.64	96	304
9	36	114.03	54	171	72	227.97		
10	40	126.70	60	190	80	253.30		
11	44	139.37	66	209	88	278.63		
12	48	152.04	72	228	96	303.96		
13	52	164.71	78	247				
14	56	177.38	84	266				
15	60	190.05	90	285				
16	64	202.72	96	304				
17	68	215.39						
18	72	228.06						
19	76	240.73						
20	80	253.40						
21	84	266.07						
22	88	278.74						
23	92	291.41						
24	96	304.08						
25	100	316.75						

Table 3b–4 Strip width adjustments for drills and seeders on 15-inch rows

# of passes	4 row # of rows	4 row width ft	6 row # of rows	6 row width ft	8 row # of rows	8 row width ft	12 row # of rows	12 row width ft
1	8	10	12	13	15	20	24	30
2	16	20	24	26	30	40	48	60
3	24	30	36	39	45	60	72	90
4	32	40	48	52	60	80	96	120
5	40	50	60	65	75	100	120	150
6	48	60	72	78	90	120	144	180
7	56	70	84	91	105	140	168	210
8	64	80	96	104	120	160	192	240
9	72	90	108	117	135	180		
10	80	100	120	130	150			
11	88	110	132	143	165			
12	96	120	144	156	180			
13	104	130	156	169				
14	112	140	168	182				
15	120	150	180					
16	128	160						
17	136	170						
18	144	180						
19	152							
20	160							
21	168							
22	176							
23	184							

Alignment

Alignment is generally the most important factor in farmability of contour buffer strip systems. The tools for the traditional method of laying out a key line for establishment of a contour buffer strip system are a hand level, a measuring tape, cable, or rope equal to the maximum width of the cropped strips, an assistant, and some surveying flags.

Laying out the key line

On level ground, determine your eye height on the assistant by sighting through the hand level to a point on your assistant the same level as your eye.

Walk to the top of the slope where the buffer strips are to be installed. Measure downhill the width of the crop strip as previously calculated and place a surveying flag in the ground. If two prominent hills are joined by a somewhat lower ridge or saddle, measure down from the seat of the saddle rather than the top of either of the hills (fig. 3b–2). If this condition exists, one or more contours may be needed above the key line to fully protect the top of the slope.

Position the assistant at the survey flag. Taking flags and the hand level, pace about 50 feet across the slope at approximately the same elevation and sight back on the same spot on your assistant that was identified on level ground. Move up or down slope until the hand level bubble is centered on the spot on your assistant. Put a flag in the ground at your feet at this spot. Pace another 50 feet around the slope while the assistant moves to the second flag. Repeat the process.

Continue setting flags on the contour until you reach the field edge. Return to the beginning flag and repeat the process in the opposite direction until you reach the other field edge. The line you have staked is the key contour line and the upper border of the first grass strip. Drive a pickup or tractor along the line to make sure there are no curves too sharp to maneuver machinery. Straighten any curves by adjusting one or more flags. Varying the grade along the line is a useful technique to increase farmability by straightening curves.

Laying out the contour buffer strip

Find the steepest part of the slope along the contour line and measure downhill the minimum width of the grassed strip. This contour line will be the lower border of the grass strip (fig. 3b–2). Place a different colored flag at that point and lay out another contour line using the procedure described above. Unless the topography is uniform, the grass strip will not be a uniform width. It should not be narrower than the minimum buffer width at any point.

Laying out the second crop strip

From the line representing the lower border of the grass strip just staked, extend a tape or cable downhill the width of the cropped strip (fig. 3b–3). One person walks along the line just staked while the other person stretches the cable perpendicular to that line and places flags at 50-foot intervals along a new line parallel to the bottom edge of the grass strip. The cable should always be stretched perpendicular to the previously staked line to ensure that the cropped strip is of uniform width.

Figure 3b–2 Staking key line and buffer widths

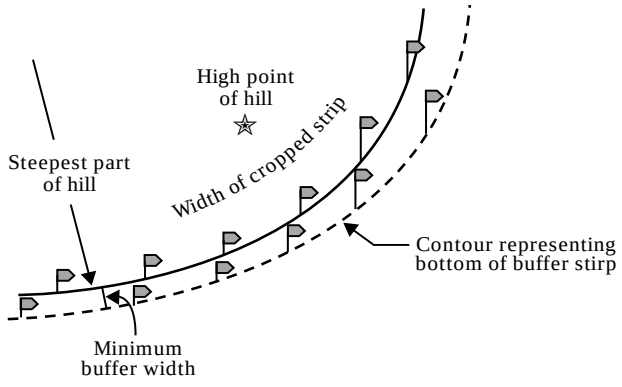
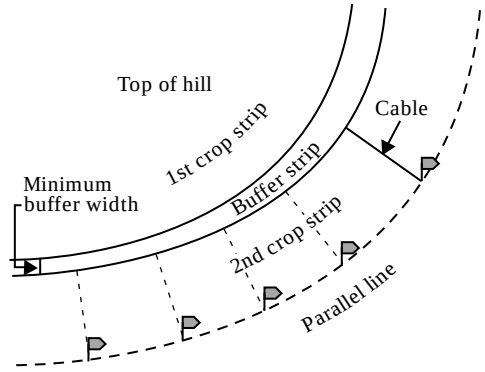


Figure 3b–3 Staking width of cropped strip below buffer strips



One helpful method of ensuring that measurements are made perpendicular to the lower edge of the preceding grass strip involves the use of a pickup truck. Attach the cable to the front corner of the pickup bed in the gap next to the pickup cab (fig. 3b–4). One person drives the truck along the contour line while the other stretches the cable down hill the width of the crop strip. At points around the slope, the person at the end of the cable places flags at 50 foot intervals by first aligning himself or herself such that daylight can be seen through the gap between the truck bed and cab. This ensures that the crop strip is parallel to the bottom of the grass strip above, and is of uniform width.

If the topography is uniform, additional strips may be established parallel to the first by simply staking parallel lines using the cable and truck. However, if the topography is not uniform, additional grass strips should be staked by finding the steepest point along the lower border of the crop strip just staked, measuring down the width of the grass strip, and staking a new contour line representing the lower border of the grass strip. The crop strip width is flagged using the truck and cable or other means to ensure uniform width.

This procedure avoids point rows, but may result in more area comprising grass buffers. The procedure can be reversed to establish even width grass strips that minimize the amount of the field in grass, but point rows and a less farmable system result.

An alternate method for layout of contour buffer strips can be used in irregular topography to ensure that the leading edge of each buffer strip is on, or close to the contour. In this method the key line is staked in the same fashion as described previously. Next, at the steepest part of the slope, a point is staked downslope from the keyline equaling the minimum width of the buffer strip plus the adjusted crop strip width. From this point another contour line is staked representing the leading edge of the second contour buffer strip. This line is then adjusted for farmability. Next, using the cable or rope representing the adjusted crop strip width, the crop strip is staked between the two buffers. The line staked is the lower edge of the first contour buffer. Irregularities in the two contour lines are contained the variable width of the buffer strip.

Opportunities exist to enhance wildlife habitat in the irregular shaped contour buffers. Trees and shrubs may be established in areas where sharp corners are avoided if they do not interfere with normal equipment operation.

Reverse curves

Reverse curves should be avoided in contour buffer strip layout. A reverse curve is two circular curves on the opposite side of a common tangent (fig. 3b–5). As an example, the line may first curve to the right and then to the left. Each of the curves has a radius point, so as rows are planted parallel to the line they can only be parallel as far away as the radius point of each curve. Each curve becomes more gradual and more farmable as rows are planted parallel to the line as the length of the radius increases. However, the curve

Figure 3b–4 Buffer strip layout using a pickup truck and cable

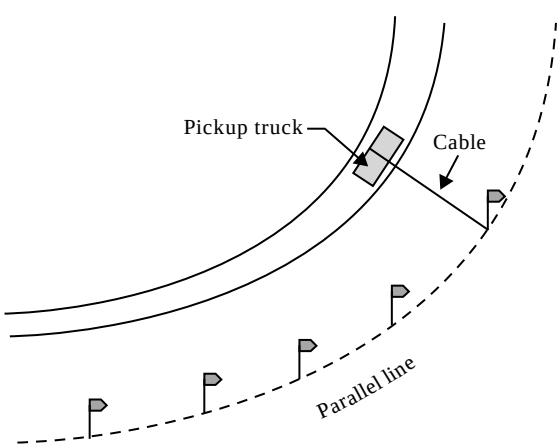
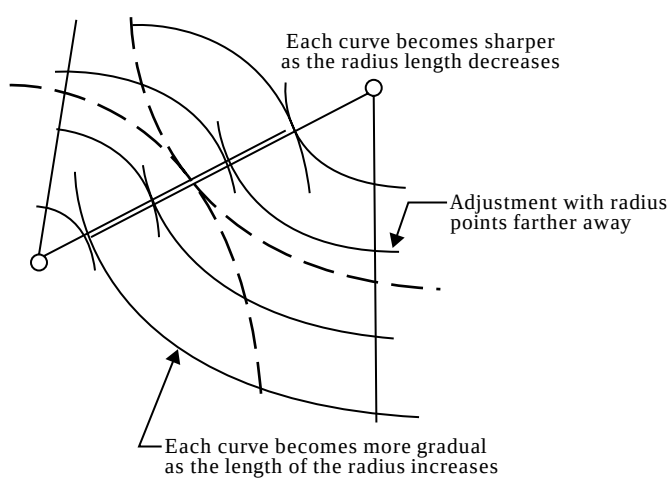


Figure 3b–5 Contour line adjustment for reverse curves



becomes sharper as the length of the radius becomes shorter. At some point, depending on the size of equipment, the curved rows become too sharp to be farmable. This can be avoided by making the curves more gradual, by moving the radius point farther away, or by putting some grade in the buffer boundary.

Buffer strips should be parallel to the extent possible. Where topography is irregular, each buffer strip should have a parallel crop strip above it with the correction made by varying the width of the buffer strip by re-aligning the lower boundary instead of planting point rows in the cropped strip.

Although, farmability is important in the acceptance of a contour buffer strip system, the flattening of curves should not result in grades along the edges of the buffer or crop rows exceeding the lesser of half the downhill slope grade or 2 percent (fig. 3b–6). Up to 3 percent row grade may be permissible for distances of less than 150 feet as rows approach a stable outlet, such as a grassed waterway. Maximum effectiveness of the buffer is achieved when overland flows are broad and not concentrated as they enter the buffer.

Layout at field edges

Contour buffer strip systems are more farmable when they approach the ends of the field at right angles (fig. 3b–7). This facilitates the turning of equipment. In other cases buffer strips may be laid out parallel to field edges with slight adjustments in grade and alignment to avoid point rows. In either case, opportunities may exist to establish field borders to facilitate equipment operation and enhance the effectiveness of the entire system.

Plant materials information

The state contour buffer strip practice standard contains minimum requirements for locally adapted vegetation for the buffer strips to be established for various purposes. Generally, contour buffer strips are established to either legumes, grasses, or grass-legume mixtures when erosion control is the primary purpose. Permanent sod-forming grasses alone are used when filtering of sediment or other water-borne contaminants is the primary purpose. If both purposes are served, then the more stringent criteria for sod forming grasses should be used.

Stem densities of mature stands should be greater than 50 stems per square foot for grasses and greater than 30 stems per square foot for legumes depending on the purpose of the buffer and the species seeded. Species should be adapted to the climate and soil conditions of the site. If the state standard does not contain specific plant materials criteria, suitable seeding mixtures meeting the requirements for buffer purposes may be selected from other vegetative practice standards, such as Grassed Waterways, Critical Area Planting, or Pasture and Hayland Planting. Generally, the grass mixtures and seeding rates from the

Figure 3b–6 Buffer boundary grade

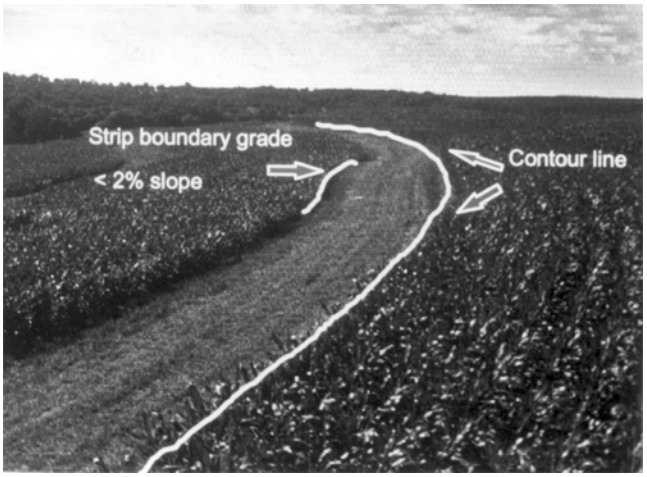
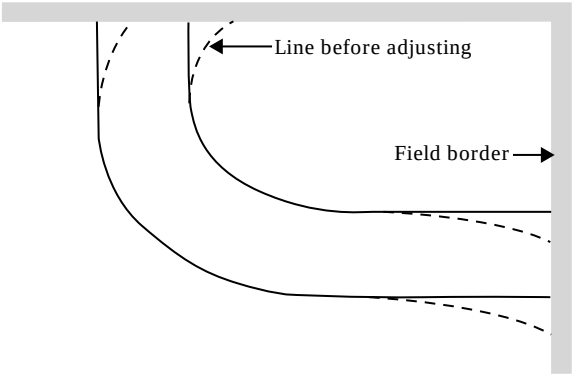


Figure 3b–7 Buffer alignment adjusted to meet field edges at right angles



Grassed Waterway or Critical Area Planting standards are more suitable for purposes of filtering pollutants when used for buffers. The grass-legume mixtures from Pasture and Hayland Planting standards may be adequate for erosion reduction purposes.

The effectiveness, longevity, and maintenance of the buffer strip can be enhanced by planting and maintaining a narrow 2- to 3-foot strip of tall, stiff stemmed grass along the upper edge of the buffer strip. This tends to pool the runoff before it enters the buffer strip, and sediment is dropped in the adjacent cultivated area where it can be removed without destroying and reseeding the buffer strip. Figure 3b–8 shows vegetative barrier enhancement. See chapter 3i for information on vegetative barrier.

Site preparation

The flow entering the contour buffer strip must be diffused and uniform. Small gullies or channels that exist on the slope should be smoothed and seeded before the buffer strip is established. This will provide a stable outlet for concentrated flows. Noxious weeds should be eliminated along with any debris, stones, or other obstructions that will affect either the establishment, function, or maintenance of the buffer strip.

Planting methods

A new seeding generally is the preferred method to establish buffer strips. In some cases if land is coming out of setaside or CRP, the existing vegetation is left in the areas designated as the buffer strips. Lime and fertilizer should be applied according to soil test recommendations before seedbed preparation. A firm seedbed about 4 inches deep should be prepared, and the seed drilled or broadcast and lightly covered. In some cases a no-till drill or direct seeder is used to seed buffer strips.

Operation and maintenance

The establishment period is critical to the success of the buffer strip. Weed competition should be controlled by mowing during the establishment period.

All field operations should be conducted parallel to the strip boundaries. Tillage, planting, spraying, and harvesting operations should be kept off the buffer strips. Even wheel tracks from incidental vehicular traffic can lead to concentrated flows, gullies, and failure of the buffer strip. Traffic should especially be kept from the upper few feet of the buffer strip because this area does trap more sediment and filter more contaminants than any other area. By maintaining a thick, stiff, tall stand of grass, the buffer tends to pool water in front of it and actually deposits most of the sediment on the adjacent cropped area. This sediment is much easier to remove and place back on the cultivated strip if it is not allowed to be deposited within the buffer itself. Figure 3b–9 illustrates maintenance of the buffer strips.

Poor adjustment or improper operation of tillage equipment in the cropped strip can result in poor performance of the buffer strip. For example, if a tandem disk is not leveled from front to rear it creates ridges across the slope. The ridges often concentrate runoff and then break over forming ephemeral gullies. When operating disks and other implements next to the buffer strips, care should be taken not to form a ridge on the upslope edge of the buffer or furrow on the lower edge.

Mowing operations should be timed to maintain tall vegetation during periods of high intensity storms. If wildlife habitat enhancement is desired, mowing should be delayed until after the nesting period of

Figure 3b–8 Buffer with vegetative barrier enhancement

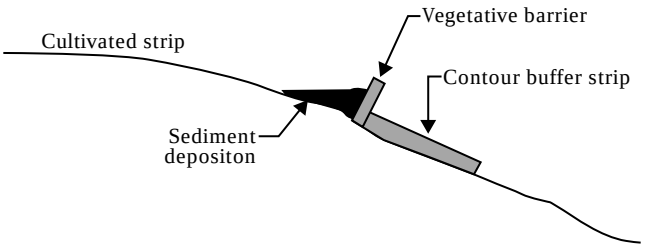
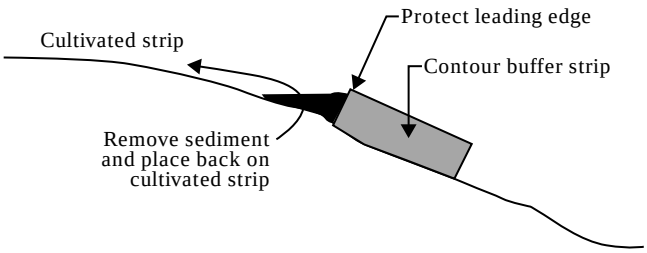


Figure 3b–9 Buffer maintenance



desired wildlife species. To maintain vigorous growth, the buffer strips should be fertilized with the rest of the field.

Inspect the buffer strips regularly, especially after major storms. Repair by reseeding or sodding any areas damaged by concentrated flow, machine operation, or herbicide application.

If renovation is eventually needed, new buffer strips should be established immediately beside existing buffer strips. On a given slope all new buffer strips should maintain the same relationship to the old strip, either all above the old strip or all below the old strip. This preserves the spacing relationships with the cropped areas. Figure 3b–10 illustrates this procedure. After a mature stand is established, destroy the original buffer, regrade the area if necessary to allow overland flows to reach the new contour buffer, and return the former buffer area to crop production.

Case study example and information needed to fill in job sheet

Setting

A 40-acre field in southeast Nebraska is composed of Pawnee clay loam and Wymore silty clay loam soils on slopes ranging from 2 to 11 percent. Typical slopes used for erosion prediction are 8 percent and 200 feet long (fig. 3b–11). Slope length is measured from the point where overland flow begins at the top of the slope and ends at the point of significant deposition or where the sheet flow enters a concentrated flow channel.

Several grassed waterways in the field drain into larger tributaries that feed a recreation lake downstream. Therefore, agricultural runoff and sediment are concerns as well as soil erosion on this field.

Step 1—On the specification sheet, place an X in the boxes designating all purposes for which contour buffer strips are being designed for the site. More than one primary purpose may be served. Use the other block for secondary purposes, such as enhancing wildlife habitat. Additional specifications may be required for design and layout to accommodate secondary purposes. Enter these on the back of the specifications sheet or on additional sheets as necessary.

In this example, reduce sheet and rill erosion and reduce pollution from runoff are checked on the specifications sheet.

Location and layout of strips

The slopes are moderately to severely eroded and have been farmed to corn or grain sorghum and soybeans for many years. This field now is leased by a producer who farms with large equipment consisting

Figure 3b–10 Maintaining spacing when reestablishing

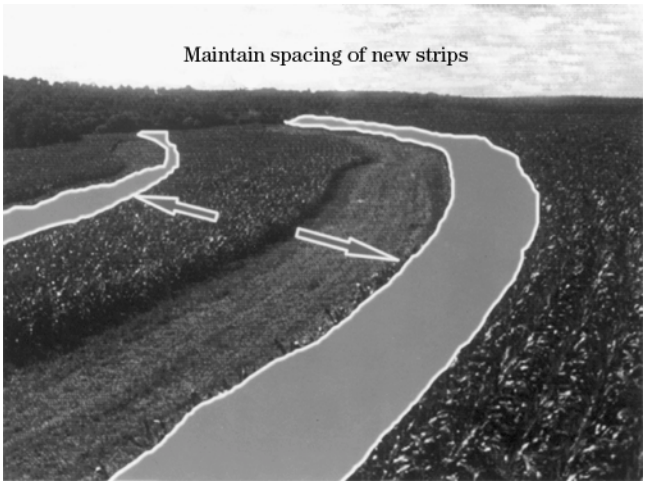
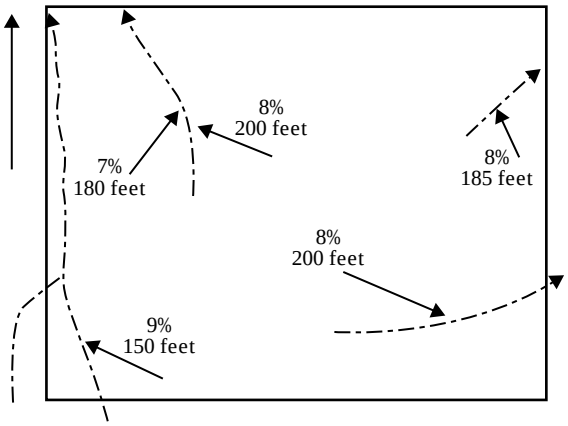


Figure 3b–11 Field sketch with slope measurements



of a 12-row, 30-inch spacing planter and a 15-foot no-till grain drill. Terraces and contouring are common in this area, but this field has not had these practices applied.

Step 2—Determine the widths of the cultivated and buffer strips in the location and layout portion of the specifications sheet. Because the buffer strip's length and width vary during layout, only an estimate of the acres in the buffer strips can be made beforehand based on sketches, an aerial photograph, or other means. This is useful in planning with the landowner. If more precise information on area comprising the buffers is needed, it may be better to delay this calculation until after layout when more precise measurements can be used.

From RUSLE it is determined that the critical slope length for contouring is 417 feet. The actual slopes in this field do not exceed 200 feet; therefore, critical slope lengths have not been exceeded and the practice itself applies to the site. Because two purposes, erosion reduction and reduction of sediment-borne pollutants, are identified, the criteria for both must be compared. Whichever is most restrictive is then used in designing the contour buffer strip system.

The criterium for width of cropped strip for the erosion control purpose is the lesser of half of **L** or half of the critical slope length for contour strip cropping. In this case half of **L** is 100 feet. The critical slope length for contour strip cropping is 1.5 times the slope length limit for contouring, or (417 feet x 1.5) = 624 feet. Half of this limit is 312 feet, so the slope length limit for contour strip cropping has not been exceeded. Therefore, for the erosion control purpose, the 100 feet or half of **L** criterium applies.

For the sediment-borne pollutant purpose, the maximum cropped strip width is half of the slope length or a maximum of 150 feet, whichever is less. In this case half of **L** is less than 150 feet, so half of **L** governs for this purpose as well. Thus the maximum cropped strip width is 100 feet.

Next, an adjustment is made to this width for multiple passes of the equipment. From table 3b–1 it is noted that three passes with the 12-row, 30-inch spacing planter covers a width of 90 feet and that 6 passes with the drill also covers 90 feet. The cropped strip width can be adjusted downward to 90 feet and will fit both machines quite well. Enter this width in the blank on the specifications sheet for strip 1 for width of the cultivated strip. See figure 3b–12.

Consideration must also be given to the use of other equipment, such as sprayers. For example, a sprayer with a 60-foot boom can be successfully used on the 90-foot strip by making one full pass and then a half pass with half of the boom shut off to avoid overlap and avoid spraying the buffer strip.

Next, the width of the buffer strips must be determined. This width depends on the purposes being served and the kind of vegetation required. Because two purposes are identified, the criterium for each must be compared. The erosion control criterium allows either a 15-foot width when grasses or grass legume mixtures are seeded or a 30-foot width when legumes alone are seeded. On the other hand the sediment borne pollutant criterium allows only the use of stiff-stemmed grasses with a minimum width of 15 feet and a double width strip at the base of the slope. (figure 3b–1). In this case the more stringent sediment-borne pollutant criteria governs.

Enter on the specifications sheet 15 feet for strip 2, 90 feet for strip 3, and 30 feet for strip 4. If during layout it is determined that more than two pairs of crop/buffer strips are needed, only the bottom strip needs to be 30 feet wide.

Plant materials information

Step 3—For each buffer strip enter the common names of the selected species, seeding rates per acre, seeding date, and lime and fertilizer requirements.

The Nebraska practice standard for contour buffer strips specifies that for the sediment and water-borne contaminant purpose the permanent grass seeding mixture should consist of at least 60 percent stiff-stemmed sod forming grasses, such as switchgrass, big bluestem, or pubescent wheatgrass. The seeding rate criterium is a minimum of 40 pure live seeds per square foot. Using the appropriate seeding table from the Nebraska Pasture and Hayland Planting practice standard, it is determined that both big bluestem and switchgrass are adapted to this vegetative zone and to pasture and hayland suitability groups A-2 and A-4 to which the Wymore and Pawnee soils respectively are assigned. Of the cool-season grasses, smooth bromegrass and intermediate wheatgrass are also adapted to these soils. Since the buffer strip will receive herbicide-contaminated runoff, switchgrass is a good choice because it is tolerant to atrazine.

Using the procedure in the Pasture and Hayland standard, a mixture of 40 percent switchgrass, 40 percent big bluestem, and 15 percent intermediate wheatgrass is developed. Based on this mixture, it is calculated that 2 pounds of switchgrass, 4.3 pounds of big bluestem, and 4 pounds of intermediate wheatgrass per acre are needed. The seeding date for these grasses is November 1 to May 20 in this vegetative zone. This information is inserted in the plant materials information section of the Specifications Sheet for strips 2 and 4 and noted that strips 1 and 3 are cropped strips.

The field was limed 2 years ago so it is assumed that the lime requirements have been met. Since no soil test has been taken and since the soils are eroded, a standard 1,000 pounds of 12-12-12 fertilizer per acre is specified in the fertilizer column for strips 2 and 4.

Step 4: Specify details of needed site preparation in the Site Preparations section of the specifications sheet.

In this example, no special site preparation is required.

Step 5— Specify the planting method, seeding depth, and mulching requirements in the Planting Methods section of the specifications sheet.

Since the farmer has a 15-foot no-till drill with grass seed attachments, no-till is specified as the planting method. In addition, one bushel (32 pounds) of spring oats per acre is specified as a nurse crop.

Step 6— Specify the operation and maintenance requirements in the Maintenance section of the specifications sheet or on attachments.

The oats nurse crop is specified to be mowed or clipped before it heads out in the Maintenance section of the specifications sheet.

Step 7— Make a sketch of the field with approximate locations of buffer strips and supporting practices.

A sketch of the field is made on the back of the specifications sheet. In addition to approximate locations of buffer strips, the location of grassed waterways and field borders which will complement the system are also shown (fig. 3b–13).

Contour Buffer Strips

Conservation Practice Job Sheet ***332***

Natural Resources Conservation Service (NRCS) ***April 1997***

Landowner_____

Definition

Contour buffer strips are strips of perennial vegetation alternated with wider cultivated strips that are farmed on the contour.

Purpose

The benefits of farming on the contour and practicing crop residue management make contour buffer strips an effective conservation practice. This practice is further enhanced when used with other conservation practices, such as conservation tillage and crop rotation.

Contour buffer strips slow runoff and trap sediment. Grass strips established on the contour can significantly reduce sheet and rill erosion. Sediment, nutrients, pesticides, and other contaminants are removed from the runoff as they pass through the buffer strip. Grass strips also provide food and nesting cover for wildlife.

Where used

- On cropland where sheet and rill erosion are problems. Contour buffer strips are an excellent filter for runoff and will improve surface water quality.
- Where contouring is practical. Contour buffer strips are unsuitable in fields with irregular, rolling topography where contouring is impractical.

Requirements for establishing contour buffer strips

Contour buffer strip layout

Recommendations for establishing contour buffer strips include a minimum buffer strip width, with strips placed along the contour and farming operations that follow the approximate contour grade. Cultivated strip widths are determined by variables, such as slope, soil type, field conditions, climate, and erosion potential.

Other considerations in layout of contour buffer strips include:

- Cultivated strip widths may be adjusted, generally downward, to accommodate machinery widths.
- Cropping between the buffers strips, including tillage, rotation, and crop residue use, should be acceptable to the soil and site conditions.
- Buffer strips can be used as turn areas if care is taken to minimize disturbance to soil and vegetation.
- Waterways or diversions are needed where runoff concentrates and erosion is a problem.
- Contour buffer strips may be part of a wildlife habitat program.
- Contour buffer strips can be established between terraces to enhance treatment of the hill slope.
- A ratio of cultivated to buffer strip width of between 9:1 and 4:1 is desirable.

Wildlife

When planning for wildlife, adjust buffer width and plant species to meet the needs of the target wildlife species. Avoid mowing during the nesting period.

Specifications

Site-specific requirements are listed on the specifications sheet. Additional provisions are entered on the job sketch sheet. Specifications are prepared in accordance with the NRCS Field Office Technical Guide. See practice standard Contour Buffer Strips (332).

Operation and maintenance

- Mow buffer strips to maintain appropriate vegetative density and height for trapping sediment.
- Fertilize buffer strips according to soil test recommendations.
- Spot seed or renovate buffer strip area damaged by herbicides, equipment, or unusual rainfall events.
- Redistribute sediment accumulations as needed to maintain uniform sheet flow along the crop/buffer boundary.

Contour Buffer Strips – Specifications Sheet

Landowner *Bill Brown* Field number *7*

Purpose (check all that apply)	
☑ Reduce sheet and rill erosion	☐ Provide wildlife habitat
☑ Reduce pollution from runoff	☐ Other (specify)

Location and Layout	Strip 1	Strip 2	Strip 3	Strip 4
Cultivated width (ft)	*90 '*	—	*90 '*	—
Buffer strip width (ft)	—	*15 '*	—	*30*
Buffer strip length (ft)	*to be determined during layout*			
Acres in buffer strip				

Plant Materials Information				
Species/cultivar	Seeding rate (lb/acre)	Seeding date	Recommend lime (tons/acre)	Recommend fertilizer N-P_2O_5-K_2O (lb/acre)
Strip #1				
1 *Cultivated Crop*				
2				
3				
4				
Strip #2 *Contour Buffer Strip*				
1 *Switchgrass*	*2.0*	*Nov. 1 to*	*None*	*1,000 lb 12-12-12*
2 *Big Bluestem*	*4.3*	*May 20*		
3 *Intermediate Wheatgrass*	*4.0*			
4				
Strip #3 *Cultivated Crop*				
1				
2				
3				
4				
Strip #4 *Contour Buffer Strip*				
1 *Switchgrass*	*2.0*	*Nov. 1 to*	*None*	*1,000 lb 12-12-12*
2 *Big Bluestem*	*4.3*	*May 20*		
3 *Intermediate Wheatgrass*	*4.0*			
4				

Site Preparation

Prepare firm seedbed. Apply lime and fertilizer according to recommendations.

Planting Method(s)

Drill grass and legume seed *1/4-1/2* inches deep uniformly over area. Establish stand of vegetation according to recommended seeding rate. If necessary, mulch newly seeded area with — tons per acre of mulch material. May seed small grain as a companion crop at the rate of *32* pounds per acre, but clip or harvest before it heads out. *Spring Oats*

Maintenance

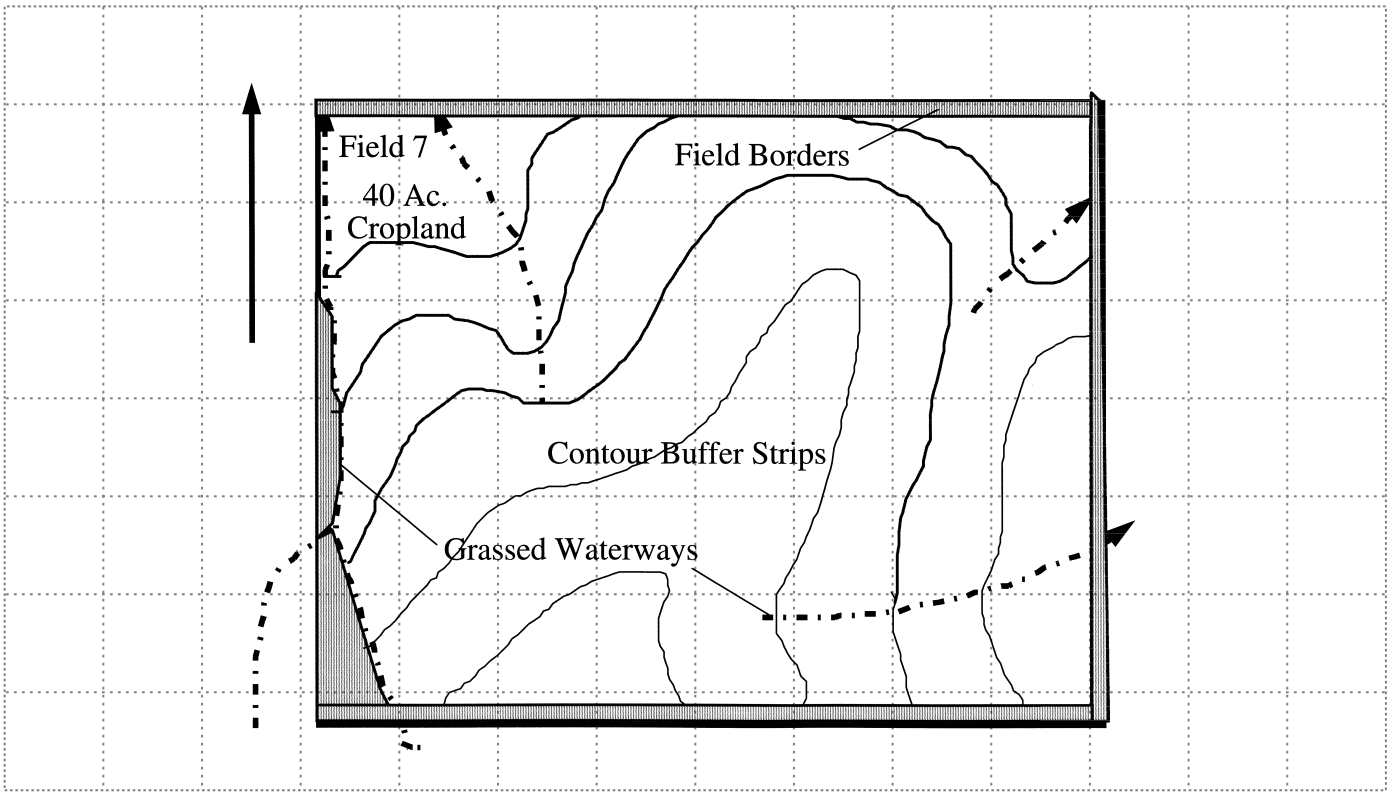
Buffer strips must be inspected periodically and protected from damage so proper function is maintained. Damaged areas should be repaired and/or revegetated. Sediment accumulations should be redistributed as needed to maintain uniform sheet flow along the crop/buffer boundary.

Mow or clip the oats before head stage

Contour Buffer Strips – Job Sketch

If needed, an aerial view or a side view of the contour buffer strips can be shown below. Other relevant information, such as complementary practices, and adjacent field or tract conditions including structures and crop types, and additional specifications may be included.

Scale 1"= N/A ft. (NA indicates sketch not to scale: grid size=1/2" by 1/2")



Additional Specifications and Notes:

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