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Planning and Applying Prairie Strips

Agronomy Technical Note No. 41

Overview

Prairie strips (strips) are a conservation system that use native plants to protect soil and water resources in row crop fields. The primary purpose of prairie strips is to reduce soil erosion and protect water quality by filtering surface and subsurface water flow. The secondary purpose is to provide wildlife and beneficial insect habitat by establishing diverse native prairie plant communities.

The prairie strips system offers farmers and landowners a flexible conservation tool to complement their operation. Goals and objectives of the farmer and landowner, landscape characteristics, climate, and farming operation must be considered when planning strips.

Prairie strips on the Iowa State University Armstrong Research Farm near Lewis, in southwest Iowa.

Conservation Practices

The prairie strips system is designed using four primary conservation practices: Conservation Cover (327), Field Border (386), Filter Strip (393), and Contour Buffer Strips (332). Plan these conservation practices in combination or individually to design the prairie strips system to accommodate site conditions and client's conservation goals.

Prairie strips are effective in reducing sheet and rill soil erosion when designed along the contour on sloping ground or in locations of high erosion rates such as end rows on steep slopes. Consider practice standard Contour Buffer Strips (332) in combination with Field Border (386) when the client's objective is sheet and rill erosion control. When designed to intercept rainfall runoff and/or groundwater flow, strips are effective to filter pollutants such as sediment, nutrients, and pesticides. All four primary conservation practices can be planned to effectively filter pollutants. Designing strips to filter takes careful consideration of the natural path of water flow, slope of the land, and volume of water. Orient strips so runoff water will travel through and not along the strip. When planning strips adjacent to waterbodies consider practice standard Filter Strip (393). Strategically locating native perennial vegetation in annual row crop fields provides multiple conservation benefits, and planning Conservation Cover (327) as a single practice to achieve the purpose(s) of prairie strips is an option.

Determine Objectives

Planning strips requires knowledge of the client's objectives, along with an understanding of the farming operation. Objectives will influence all aspects of planning strips which makes this step critical. Understand why prairie strips are being considered and tailor the design to meet the conservation objectives.

Inventory

Information gathered during inventory is valuable to plan an effective system. Inventory the field using off-site methods such as maps and information provided by the client to supplement field observations. Include the following during inventory:

- Locations of potential or active sheet and rill erosion.
- Waterbodies such as rivers, streams, ponds, and wetlands that are adjacent to or within the crop field.
- Delineate watersheds and define patterns of surface flow.
- Study the landscape and soil types to predict groundwater flow and depth to water table.
- Note locations of wildlife habitat.
- Understand the cropping system by collecting information such as crop rotation, row pattern, residue management, equipment size, fertilizer use, weed and pest control strategy, and if the field is grazed after harvest.
- Use information from the farmer and field observations to identify locations of low productivity.

Prairie strips and a grassed waterway line a corn and soybean field in Grundy County, Iowa.

- Inventory current conservation practices and assess their effectiveness in controlling soil erosion and protecting water quality and determine if strips can be incorporated to improve resource protection.

Planning Prairie Strips Location

Location will be determined by client objectives, cropping system, and site characteristics. Prairie strips may be placed at the field edge, through the field, along grass waterways, next to water bodies, in terrace channels, and any location that will reduce soil erosion and/or filter surface or subsurface water. When designing prairie strips through the field on land with 5% slope or greater, the row grade requirements for sheet and rill erosion control and nutrient transport in NRCS practice standard Contour Buffer Strips (332) must be applied.

Use information gathered during inventory to determine the most effective locations and orientation.

Consider the following when planning location:

- Soil erosion and sediment delivery may be significantly reduced by planning a system of contoured strips on sloping land and filtering strips at the bottom of the slope.
- Benefits can be maximized when 10% of the acres in a small watershed are established to contour and filtering strips.
- Orient strips to intercept water runoff in all locations where water enters and exits the field.
- Include low producing areas into the strips design if possible.
- Replace turn rows with prairie strips.
- Prairie strips may not be used as a lane or road. Choose locations that avoid frequent heavy equipment use or other activities that will cause bare ground conditions.
- Herbicide and pesticide drift into strips will have negative impacts on plants and insects. Consider spray drift potential and determine if strips location and/or width should be adjusted. Speak with the client about strategies to avoid spray drift.
- Design the system according to the current cropping pattern, or work with the farmer to adjust the row pattern to maximize effectiveness.

- Locate strips to provide connectivity to existing wildlife habitat.

Prairie strips are not appropriate to replace waterways. When addressing gully erosion, consider designing strips to support practices such as Grassed Waterway (412), Terrace (600), Water and Sediment Control Basin (638), or Grade Stabilization Structure (410). Design strips to filter and/or reduce sheet and rill erosion to complement gully erosion control.

A first-year prairie strip on a farm near Traer, Iowa.

Examples include:

- In the watershed of a Grade Stabilization Structure (410) to provide filtering and increased infiltration.
- Spaced parallel below a Terrace (600) to increase soil protection.
- In the storage area of a Water and Sediment Control Basin (638) to filter water runoff before exiting through an outlet.
- Designed parallel to Grassed Waterways (412) as filter strips. Caution must be taken when designing strips parallel to grassed waterways to ensure water filters through the strip and into the waterway.

Planning Prairie Strips Size

Prairie strips should not exceed 25% of field acreage. Minimum width is 30 feet and, in most cases, should not exceed 120 feet in width. Increase strip width on steep slopes, soils with high clay content, when buffering waterbodies from pesticide drift, and in locations with expected high volume of runoff. Increasing the designed width will improve habitat for wildlife and beneficial insects. If wildlife and/or beneficial insect habitat is an objective, consider maximizing the width to 120'. When planning Filter Strip (393), Field Border (386) or Contour Buffer Strips (332), use minimum width requirements as define in the practice standard.

Strip width may vary to accommodate farming practices and/or slope steepness. When planning strips through the field alternating with cropland, adjust the design to avoid point rows or partial planter passes if possible.

Planning Prairie Strips Seeding

Seed a mix of diverse stiff stemmed native grasses and forbs that will grow dense to provide filtering and thick ground cover. Native grass species such as Big Bluestem (Andropogon gerardii), Canada Wildrye (Elymus canadensis), Indiangrass (Sorghastrum nutans), and Switchgrass (Panicum virgatum) are common stiff stemmed native grasses to consider when designing the strips seed mix. Design the seed mix to include forb species that will provide active plant growth and flowering throughout the growing season. A minimum of two flowering species in each growing season; spring, summer, fall, will be included in the mix. Seed mix will comprise 50% grass and 50% forbs to achieve a balanced grass and forb plant community. Introduced grass and forb species are not allowed. When available, source seed locally to ensure species are adapted to local conditions. Design the seeding according to practice standard Conservation Cover (327).

Establishment and Maintenance

Clients implementing strips will need information on establishing and managing native prairie. Include documents such as the Iowa Native Prairie Planting Guide, or similar reference to assist the client with their establishment and maintenance activities.

Mowing two to three times during the growing season of the first two years is important for establishment. Mowing will reduce weed competition and allow light to reach the young prairie plants. After establishment annual maintenance is needed to control weeds and monitor the effectiveness of the prairie strips system. Periodic maintenance activities such as prescribed burning, spot spraying, spot mowing, grazing, and interseeding are needed to promote plant diversity and foster a healthy plant community. Protect wildlife by conducting maintenance activities outside of the primary nesting and fawning season (May 15 – August 1). Limit activities to spot treatment such as spot mowing or spot spraying if maintenance is needed during the primary nesting and fawning season.

Conservation Programs

Program opportunities to support prairie strips are available through USDA and other conservation organizations. Incorporate program polices into the conservation plan for clients participating in programs.

A blooming prairie strip on the Iowa State University Armstrong Research Farm near Lewis, in southwest Iowa.

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