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Conducting a Prescribed Burn on Warm-season Grass CRP Sites

Bruce Anderson, Extension Forage Specialist; James L. Stubbendieck, Professor, Grassland Ecology

This NebGuide defines how to safely and legally conduct a prescribed burn on warm-season grass CRP sites.

Prescribed burns on Conservation Reserve Program (CRP) sites composed of warm-season grasses require special safety precautions. The extremely high fuel loads of dry, highly volatile grass make safety preparation and weather conditions very important. Winds can quickly move headfires and create high flame lengths and intense heat.

Large CRP sites often are completely burned just minutes after the headfire is ignited. However, burning CRP lands can be safer than many pasture burns if you follow proper procedures of mowing, raking, constructing wetlines, disking, and selecting favorable weather conditions. General guidelines on planning a burn can be found in EC148, *Grassland Management with Prescribed Fire*. This publication reviews the many items that need attention when planning a prescribed burn, including:

1. legal obligations
2. equipment
3. burning prescription
4. fireguard construction
5. ignition techniques
6. smoke management
7. personnel requirements
8. notification of neighbors

This NebGuide gives some special guidelines that will enhance the safety and ease of conducting a prescribed burn on CRP sites, including weather conditions and descriptions of site preparation tasks.

Any management practice, such as mowing and burning, planned on CRP acres under contract, must be approved by the appropriate agencies. All burning practices must be in the contract plan.

Advance Site Preparation

Appropriate weather conditions can come together unexpectedly, so it's a good idea to properly prepare the site ahead of time. Focus attention on possible trouble spots, to make sure your burn will be safe.

Select conditions and procedures that will reduce the fire's potential intensity, making it easier and safer to burn warm-season grass CRP lands. Always seek advice from others experienced in planning and conducting prescribed burns.

Warm-season grass CRP sites typically have 6,000 to 12,000 pounds of dry plant residue per acre accumulated from previous growth. This is far more than the amount of fuel necessary to carry a fire. Flammability increases when switchgrass is part of the grass component because switchgrass has a high level of more flammable hydrocarbons, making it more volatile than other grass species.

Reduce Site Fuel Amount and Height

Reduce and remove excess fuel around the edges of the CRP site. Reducing fuel reduces fire intensity and makes it easier to control backfires and headfires there. CRP contract specifications often prevent removing this residue by baling.

Flame heights are directly related to the height of the fuel or grass being burned, so mowing or shredding will reduce the fire height. Mow or shred a 50 to 70-foot wide strip around the edge of the CRP site, to provide room to move equipment and personnel in the mowed area.

Once the fire reaches the tall, unmowed area, fire intensity and flame heights are often so high that working close to the fire is impossible because of the heat. The mowed area is easier to work in and is safer for work crews because of a lower risk of tripping or falling. If the site is next to roads, fields, and other areas that will not burn or have low volatility, the width of the mowed strip may be reduced. However, the area still needs to be wide enough for all personnel and equipment to work the fire without getting close to or into the tall unmowed grass.

Mow these strips in the fall so the residue will settle down and partly decompose. Shredding cuts plant residue into smaller pieces and is preferred over mowing with a sickle-bar mower, because these small pieces settle to the ground better and make fire control easier.

Use caution when mowing or shredding to keep your equipment from starting a wildfire. Check equipment for hot bearings, exhaust pipes, or other components that can start a fire. Mow or shred under conditions of high humidity and low temperature.

Use shredders that throw residue to one side, because they leave a strip with less fuel to burn. This area can be the initial starting strip in the ignition process. Use side-delivery rakes to move the excess residue against the unmowed grass. This will leave a clean area. However, it will be difficult to work close to the fire once it reaches the windrow because of the heat generated.

Weather Conditions

Most prescribed burns on CRP sites are conducted in early to mid-spring near the date warm-season grasses begin to grow. Weather conditions are highly variable during this time of year and can change rapidly. Desirable weather conditions must be selected to control the fire and should be documented in the burn prescription. Select weather conditions that cause slow-moving, low intensity fires due to extreme fuel loads. The three main weather conditions that influence fire behavior are wind, air temperature, and relative humidity. Cool, humid conditions work best for prescribed burns.

Consider wind speed and direction first. Wind speeds of 3 to 12 miles per hour are suggested. Avoid very calm conditions, because these are usually associated with variable wind direction, and wind direction must be constant. Avoid burning on any day that a wind shift is expected to occur. Wind shift can cause backfires to become headfires, and control could become very difficult and dangerous. Also avoid conditions where wind speed is over 12 miles per hour. Your fire chief may designate a maximum wind speed when your burning permit is issued.

Select the safest wind direction for your CRP site. When doing the site evaluation, indicate high-risk areas such as highways, homes, buildings, other CRP lands, shelterbelts and anything else that you do not want to burn or cover with smoke. Select a wind direction that will move fire and smoke upwind and away from these high-risk sites.

CRP burns can be especially smoky, and can have an effect on roads and homes nearby. Movement of the fire and smoke therefore, is a very critical concern. You may be held responsible for any accidents caused by drivers entering the smoke on a road. Some CRP sites have high-risk areas on all sides; it may not be possible to safely burn these sites.

Air temperature influences fire behavior. Higher temperatures cause fires to burn faster. Burn in low temperatures to reduce the rate of the fire spread. Temperatures in the 40 to 60°F range require much more heat to ignite the grass, therefore reducing the rate of fire spread. Avoid burning CRP sites when the temperature is over 70°F.

Relative humidity is the third weather parameter that must be considered. High relative humidity will cool and slow the movement of the fire. The higher the relative humidity, the cooler the fire. Burns have been done in a light drizzle with a relative humidity at or near 100 percent. Under these conditions, the edges where backfires are started may not burn well and may even go out. However, the unmowed area will burn once it is ignited.

A relative humidity above 60 percent is best. Start in the morning, while humidity is high, to help control backfires. Avoid igniting backfires when relative humidity is under 40 percent. Make sure that the wind direction has stabilized and thermal inversions have lifted before starting. By the time the dew is off, the backfires should be in place and much of the high-risk work should be completed. Still, avoid burning CRP sites when the relative humidity is under 20 percent.

Before you start your burn, ask a reliable weather source to verify expected relative humidity, temperature, wind speed, and wind direction. Selecting weather conditions as outlined earlier will greatly reduce risk and make it much easier to conduct a prescribed burn on CRP sites composed of warm-season grasses. The National Weather Service radio broadcasts often are the best source of weather data for prescribed burning. Weather-related websites also can be valuable resources when planning a prescribed burn because they predict wind speed and direction for several days in advance.

Prescribed Burn Safety

Safety is the most important factor in conducting a burn. The smoke will send up a signal that will attract onlookers. Be aware of firefighters, bystanders, neighbors, and others who will come to watch. Keep all persons and equipment on the outside mowed edge of the CRP site. Never let persons or equipment go into the unmowed tall grasses during a prescribed burn.

All persons and equipment must have escape routes from the fire to the outside safe areas that cannot burn. Remember that heat from the large headfire can make it so hot that people will need extra space to get away from the heat.

Many CRP sites in Nebraska have soft or wet areas where it's easy for vehicles and equipment—especially heavy equipment—to get stuck. Have large tractors and heavy chains available to pull equipment out if necessary. Since large water tanks often are impossible to pull through the wet spots, use smaller spray tanks that can be quickly refilled if wet spots are present. Fully burned areas will not burn again so keep all equipment and people on such areas to provide greater safety.

Preparation

Get the site ready by mowing or shredding the edge, as described previously, as early as possible, and arrange for all equipment and personnel necessary for the burn. Develop the burn plan and submit it to the local fire chief for review and approval. A burn permit is required to legally conduct a prescribed burn. Review the plan with the fire crew in advance

of the prescribed burn and assign tasks. When all preparations are completed, wait for a day that will give you cool, humid conditions with the correct wind speed and direction. If weather conditions and site preparation are correct, then conduct the burn. Never be afraid to cancel the burn if weather conditions are not suitable or if necessary equipment and personnel are not available.

Fireguards

A fireguard is an area around the CRP site that will prevent the fire from escaping. On tall, warm-season grass CRP sites, this fireguard may need to be as much as 200 feet wide. Tilled cropland, green wheat, and many other types of fireguards can be used. However, in many CRP sites, part of this fireguard will be the burned CRP grass at the edge of the site.

Starting at the farthest downwind side, use a burning backfire to burn the grass residue. Keeping the fire from burning out of the CRP requires equipment and work crews. Often roads, ditches, and waterways may be used as a place to start the backfire. Crews must keep the fire from getting out of the desired area. The fire is lit slowly, no faster than the crews can manage. When a fire is lit, it separates into two or more fire fronts. Fire fronts moving to the outside are put out. Allow fires that move to the center of the CRP to continue to burn. This black strip then becomes the fireguard.

One common method to construct a fireguard is to use a wetline. Select a site about one-third of the way in on the mowed and shredded strip for the line's starting point. This site should have as little grass or fuel on the ground as possible. A site that has been driven over with a tractor tire will have the residue compressed down to the ground and can be used as the line's starting point, also. Wet a line about three feet wide with a hose and sprayer from water spray equipment. Ignite the grass fuel within six inches inside this wetline. Once the

fire is burning, keep all fire from crossing the wetline. Allow the fire to burn away from the wetline to the inside. The rate of fireline ignition is determined by how quickly the crews can put out undesired fires. Check and recheck the line to make sure smoldering fires do not escape. Continue these firelines around all sides of the area to be burned that are adjacent to external vegetation or material that is to be protected.

All prescribed burning has risk associated with it. However, selection of proper weather conditions, advance preparation, having well-trained and equipped crews, and using safe conduct and proper procedures will greatly reduce the hazards of burning CRP lands. Always seek the advice of a well-trained and experienced person to assist with planning and conducting a prescribed burn.

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