

Fireguards for Small Acreage Landowners

Ray T. Hinnant

Prescribed fire is very beneficial to restore and maintain fire dependent ecosystems. The following information is for small acreage landowners with mostly grass fuels and no brush along the perimeter or brush piles in the burn unit. Fireguards or firebreaks are very important for all prescribed burns and can be the costliest component. A fireguard should be constructed along the entire perimeter of the burn area. This creates a safe perimeter and a smooth path for volunteers and equipment. Fireguards should be maintained on a regular basis to assist with the next burn and to retard a wildfire from the area. Natural firebreaks such as roads or streams can also be used effectively. The safest fireguard consists of a width of ground that is either bladed to mineral soil or disked until no plant material is available to create a grass bridge from the burn unit to the fuel outside the unit. General rule of thumb is the fireguard should be 10 times the height of the vegetation. These work great for larger burn areas, but can become a significant portion of the entire burn unit on small acreages. Small landowners who are restoring ecosystems and historic fire frequency resist community disturbance by blading or disking. There are other options such as mowing and/or using water to provide a wet line to retard fire spread or creeping.

Bladed Fireguards: Bladed fireguards remove the vegetation of an area, leaving only mineral soil remaining. These fireguards are excellent fire breaks and should be utilized if possible. Bladed lines can be accomplished by a Maintainer, dozer, tractor with blade, skid steer with blade, or even with a box blade. The soil/plant material should be rolled away from the burn area. The width of the bladed area can be accomplished by multiple passes. One pass is usually adequate for pastures with mostly grass, but two or three passes may be needed for burn units with trees and brush near the fireguards. To maintain these fireguards for multiple burns can be costly and become sacrifice areas as native vegetation is not allowed to quickly return to the area.

Disked Fireguards: Disked fireguards are similar to bladed fireguards if all of the vegetation is disked under with only mineral soil showing. You may need multiple passes of different directions with a tractor and disk to turn the forage under the soil. These fireguards can be used effectively. However, if less than 100% of the vegetation is removed, you run the risk of a grass bridge which can take fire from the burned pasture across the disked area into heavy fuels outside the burned area. If the disked area is not clean, they may require more personnel to monitor the entire perimeter. Like the bladed fireguards, if maintained, this area is sacrificed for plant production.



This is a good example of a disked fireguard. It is fairly clean but heavy fuels across the fireguard from the burn unit must be monitored during the burn.

Mowed Fireguards: Fireguards that are mowed can be effectively used as a firebreak, but the burn boss and burn crew must be constantly watching the entire perimeter for any grass bridges or escapes. To be effective they must be mowed on a routine basis throughout the year, not the day or week before a burn. They should be mowed very short (at least less than two inches), and the litter should be raked either by hand or with a hay rake or heavy nylon bristle rake behind a tractor. Failure to rake the mowed fireguard leaves highly combustible litter available for an ember to ignite or for the

backfire to creep with the wind to heavier fuels outside the burn area. You can put the windrow of grass/leaf litter either toward the burn unit or away from the burn unit. Either may cause some problem with heavy fuels alongside the mowed area. Mowing often during the year will reduce the amount of litter in the mowed area. If the litter can be removed or scattered effectively away from the fire line it could reduce the probability of ignition from an ember. The mowed lines should be at least eight - ten feet wide and two widths are even better. It is also advantageous to have two mowed lines away from a fence or tree line to give more room for volunteers to work safely and move equipment around the burned area. Using mowed/raked fireguards on either side of a bladed or disked line reduces the probability of a fire escape. If the pasture has livestock, they will assist in keeping the mowed area very short adding to the safety of a burn. If you burn off a mowed line you must be aware of the risk of fire creeping across the line and starting a wildfire. Personnel must be aware of the need to watch the perimeter constantly and quickly extinguish any fire in the mowed area.

This is a combination of disked and mowed. With forage still in the disked area, the potential for fire creeping across a grass bridge exists and requires close monitoring during a burn.



This is an example of a very clean disked line and with mowed areas of equal width on both sides make this a great example of a disked and mowed fireguard.

Wet lines: Wet lines can be used effectively for a firebreak along the backfire and flank fire. The wet line keeps the fuel moisture above the moisture of extinction allowing a backfire to move away from the fire guard to create a blackline in the pasture. Wet lines should be used in conjunction with a mowed/raked line if at all possible. To increase the safety of burning on a mowed line, utilization of wet line can be very effective. The limitation to using wet lines in most prescribed burns is the amount of water needed to spray next to the blackline. Using a wet line during the summer months or anytime the rh is very low and the temperature high poses the risk of the water drying out before backfire has moved away from the line allowing the fire to cross the mowed line. However, in small pasture burning under cool high rh conditions, wet lines can be used to increase the effectiveness of the mowed line.

A wet line is applied using either a fan or cone sprayer mounted on a vehicle or carried by a member of the burn team to spray water along the inside of the mowed line where the lead drip torch individual will be dropping fire to create the blackline. If mounted on a vehicle, the spray should be done in the front of the vehicle and then driven over by the

vehicle to spread the water into the plant material and soil. Some kind of surfactant such as soap or fabric softener should be used to increase effectiveness. After the drip torch person moves along, an atv or utv should follow to use limited spray and watch for grass bridges or embers and then following that vehicle a person with a high-power leaf blower can blow any fire or smoldering material into the black right at the edge of the blackline. Care should be taken if using a leaf blower with high wind to prevent an ember from blowing across the fireguard. Another helper needs to be constantly moving throughout the area that has had fire to monitor for any ember or grass bridge that might carry fire outside the planned burn area.



An example of application of a wet line in a mowed fireguard. Constant monitoring is required to prevent a grass bridge from setting the heavy fuel load outside the burn area. From OSU.

Prescriptions: For our use in SCTPBA, the following prescriptions will assist in developing a burn plan to meet your goals and objectives and reduce the probability of escape. If this is your first burn or you expect an inexperienced fire crew, consider burning under higher Rh, lower temperatures, and lower wind speed to reduce spot fire probability. These prescriptions are for pastures with mostly grass with greater than 3,000 lbs/ac and no or very little brush along the blackline area. Increasing rh and lowering temperature during the burn reduces the probability of ignition of an ember outside the burn unit.

	Rh	Temp	Surface wind	
Bladed Line:	>40	<80	>6 - <18	
Disked Line:	>40	<80	>6 - <18	
Mowed Line:	>50	<60	>6 - <12	(mowed or mowed/raked)
Wet Line:				
Mowed	>50	<60	>6 - <12	
Mowed/raked	>40	<80	>6 - <15	

From John Weir (2004) **Probability of Spot Fires During a Prescribed Burn**

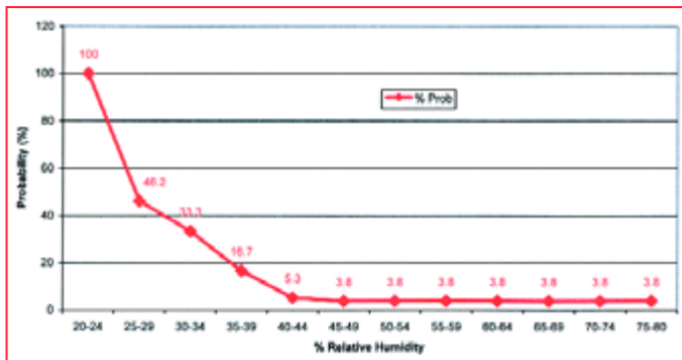


Figure 2—The probability of spot fires as a function of relative humidity, based on 99 prescribed fires conducted across Oklahoma from 1996 to 2002.