



Figure 1. Early revegetation on sandy soil following a March 24, 2016, wildfire in Barber County, Kansas.

Wildfires, accidental fires, or escapes from prescribed burning, burn thousands of acres of Kansas rangeland each year. Unlike prescribed burning, wildfires are not conducted under specific conditions to accomplish defined objectives. Wildfires typically occur during the dormant season from late fall to midspring when vegetation and soil surfaces are dry, relative humidity is low, and wind velocity is above average.

The ability of rangeland to regenerate forage after a wildfire depends on previous management, time of burning, precipitation amount, soil moisture intake, and management following the fire. Subsequent rainfall is always important, but the most critical factor may be management after the burn.

Wildfire Damages and Losses

Soil texture and the type of plant community affect the amount of damage and how an area recovers from

a wildfire. Sandy soils in Kansas typically support a mixed grass vegetation type including species such as sand/big bluestem, little bluestem, Indiangrass, switchgrass, sideoats grama, a few short grasses and numerous forbs. Much of the rangeland in eastern and central Kansas is dominated by the midheight and tallgrasses, if in good ecological condition. In the western half of Kansas, where annual precipitation is reduced, the heavier textured soils are often dominated by short grasses such as blue grama and buffalograss. Western wheatgrass, a cool-season perennial, also may exist in these shortgrass communities.

When conditions are windy, sandy soils may have a tendency to blow if the wildfire occurs well ahead of the growing season. Clay soils that remain bare have greater potential for puddling and runoff. As runoff increases, less water infiltrates the soil, and plant growth is reduced. Bare soils also lose significant amounts of water by evaporation. Soil erosion by

wind and water may be an issue until significant plant growth occurs (Figure 1). About two-thirds of the total plant growth is below ground and that helps stabilize soils to a certain extent.

Wildfire can damage grasses and other plant species. The crowns of plants often survive a wildfire and regrow, but some can be damaged if burned when soil and air conditions are dry. If litter remains after the fire, less damage will have occurred to the plant crowns. Areas with heavy litter at the time of the fire will probably have less vegetative cover and reduced yields compared to areas with light amounts of litter.

Plant communities dominated by rhizomatous species such as big bluestem, Indiangrass, and switchgrass are less likely to be damaged by fire compared to bunchgrasses and sod-forming species. The rhizome is located below the soil surface and protected from the fire, whereas the growing points of bunchgrasses such as little bluestem or short grasses such as buffalograss and blue grama are located at or near the soil surface.

March wildfires in the Hays, Kansas area on shortgrass rangeland resulted in a 65 to 77 percent reduction in yield the first growing season after the fire. Second season grass yields were still reduced to 39 percent of normal. Western ragweed numbers and yields were increased dramatically in one study, but not in the other. Little bluestem yield was reduced 49 percent by a March wildfire.

Western wheatgrass is generally increased by prescribed burning in April, but was reduced by a March wildfire. A March wildfire was more damaging to the vegetation than was a November wildfire. Reduced yields and vigor of grasses following wildfire may encourage weed invasion. Noxious weeds such as musk thistle and cool-season grasses such as Japanese brome and little barley may increase following wildfire. Trees such as eastern redcedar and others may be killed

by wildfire. On rangeland, this might be considered a good thing. Shrubs, such as wild plums, sand sage, and others may be damaged by fire but generally resprout.

Damages caused by wildfires can be catastrophic, including the loss of human life. Loss of homes, buildings, livestock, wildlife, and fences can result in damages in the millions of dollars. Additional costs are incurred for putting the fire out.

Stocking Rates on Burned Areas

Burned areas affect grazing distribution and attract livestock from unburned areas. The new growth in burned areas is more palatable and higher in forage quality. Consequently, additional management may be necessary to control grazing.

The time the wildfire occurs influences management decisions. When wildfires occur between late June and frost, the major consideration is to protect the plants from overuse. Immediate removal of the grazing animals is usually necessary. This permits regrowth and allow plants to accumulate food reserves before winter. Some grazing can occur if the level of defoliation is managed.

Wildfires occurring between fall frost and mid-March leave the soil bare until spring growth. Forage yields may be reduced, and a reduction in stocking rate is often advised.

Between mid-March and June, wildfires generally do not reduce forage production. If conditions are dry, however, regrowth will not occur, and stocking rate must be reduced. Wildfires at this time may change plant composition of the grazing land.

On sandy soils, blowouts should be controlled as soon as possible. Mulching with manure, straw, or hay free of noxious weeds, along with reseeding can stabilize the blowout area. Fencing of blowouts restricts livestock traffic and speeds recovery.

Table 1. Stocking rate guidelines for pastures burned by wildfire occurring any time other than late spring.

Area	Year after wildfire	Stocking Rate	Comments
Flint Hills and east	1	75-100%	Use lower rates during lengthy droughts
	2	normal	
Central Kansas	1	65-70%	Use lower rates during lengthy droughts
	2	90-100%	
	3	normal	
Western Kansas	1	50%	Use lower rates during lengthy droughts
	2	75%	
	3	normal	

Grazing Management

Several grazing management options exist after a wildfire. Each pasture within a burned area is unique, but certain guidelines can be followed. Areas overgrazed and in low vigor prior to a wildfire will take longer to recover. If possible, delay grazing to allow time for regrowth to occur following a wildfire.

If a wildfire occurs where prescribed burning is practiced, burn the areas that were untouched by the wildfire in late spring, when the desirable grass species have 1-1.5 inches of new growth, to encourage grazing of the entire pasture. Observe where the animals are grazing, and use grazing distribution tools such as salt, mineral, and oilers to attract cattle to underused areas.

In order for forage plants to recover, it usually will be necessary to reduce stocking rates on the burned area. Table 1 provides guidelines for adjusting stocking rates, but should be modified if the burn or weather conditions are adverse.

If a wildfire occurs where prescribed burning is not practiced, management decisions will be based on when the pasture was burned, how much was burned, and where livestock water is located. Possible management options are illustrated in Figure 2 and described in the following scenarios.

Pasture 1. A livestock watering source exists in each part of the pasture. An electric fence can be used to divide the pasture into three management areas, one part burned, two parts unburned. Adjust the stocking rate in the burned area as suggested in Table 1.

Another option would be to implement patch-burn grazing. This is accomplished by not fencing out the burned area. Livestock will concentrate on the burned area, but their grazing use will change in subsequent years as a different part of the pasture is burned.

Pasture 2. With only one livestock watering source, the decision is whether to manage the burned or the unburned area. If the unburned area is larger, separate the two with an electric fence and stock the unburned area at the normal rate. If the burned area is larger, two choices exist: Manage only the burned part by reducing the stocking rate; or establish an alternate water source, fence the area and manage it similarly to Pasture 1. If the water source in Pasture 2 were in the burned part, the unburned area would not be used unless the area was fenced and another water source established or a fenced lane was added to allow watering from the unburned area.

Pasture 3. When only a small portion of the pasture is burned, fence it off and reduce the stocking rate on the unburned portion accordingly.

Other Options. If feasible, mowing unburned areas in the early spring can encourage livestock to move from the burned area; however, do not mow in August or September. Early intensive grazing is another option for burned areas. Removing all livestock from the pasture by mid-July provides late-season rest and time for the desirable grasses to replenish root reserves. Which option to use will depend on individual situations.

Drought Considerations

If a wildfire occurs during drought conditions, further reductions in stocking rate will be necessary. Plant crowns can be damaged or destroyed by wildfires during drought periods, but the main concern is the inability

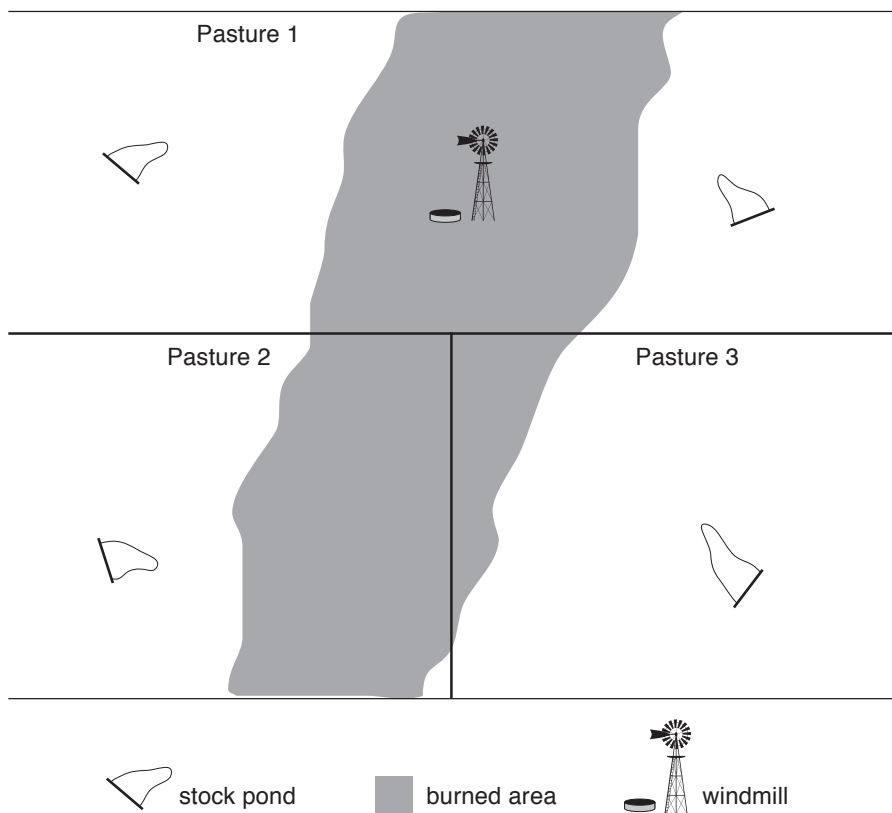


Figure 2. An example of a wildfire for considering management options.

of the plants to regrow. Lack of regrowth is due to decreased soil moisture and increased soil temperatures from the blackened surface. Under drought conditions, stocking rates should be lowered to less than those indicated in Table 1. The plants must be given the opportunity for regrowth during drought.

Hay Meadow Management

Hay meadows burned by wildfires are expected to produce less hay. In order to return hay meadows to their former production, cut the meadow in early to mid-July to allow regrowth and the replenishment of root reserves.

Summary

Management procedures following wildfire are determined by when the fire occurs and how much of a pasture is burned. Managers must adjust their practices to account for reduced forage production. Options include prescribed burning, fencing, mowing unburned areas, stocking rate adjustments, and water source development. Each situation must be evaluated. Decisions must be based on the relative size of the unburned area, water location, economics and type of livestock operation.

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Based on *Management Following Wildfire*, by Paul D. Ohlenbusch, former range and pasture management specialist, Kansas State University.

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