RESOURCE NOTES

NO. 74 DATE 08/24/04

Grazing of Livestock on Pricklypear after Prescribed Burning on Tobosagrass Rangelands

By Tom Roberts, Natural Resource Specialist, BLM, National Science and Technology Center

The use of fire as a vegetation management tool on rangelands has a long history. It has also been addressed in many environmental impact statements and site-specific environmental assessments. This emphasis has increased with the development and funding of the National Fire Plan and Ten-Year Comprehensive Strategy for Fuel Management.

The effect of postfire grazing on pricklypear (*Opuntia* spp.), a succulent cactus that ranges over most BLM-managed lands, is addressed here. Much of this information has been drawn from the United States Department of Agriculture Forest Service Fire Effects (FEIS) Information System, a large database that contains cited information on thousands of plants and animals. According to the FEIS database, the plains pricklypear (*Opuntia polyacantha* Haw.) grows in the northern and southern Great Plains, the shrub and woodlands of the Great Basin, the eastern Sierra Nevada, the borders of the Rocky Mountain forest regions, and the northern Chihuahuan Desert. It occurs from British Columbia to Manitoba, southward through North Dakota, South Dakota, and Missouri, to Texas and every State westward.

Pricklypear can be an important source of forage for wildlife and livestock. The FEIS states that it is an important seasonal forage to the black-tailed prairie dog (*Cynomys ludovicianus*) and pronghorn (*Antilocapra americana*), notably after fire has burned off the spines. The cactus has long been regarded as important emergency forage for livestock, and when the spines are burned off, either intentionally or through a wild or prescribed fire, they become a desirable forage source. Cattle ranchers in the Southwest burn the spines off the cactus to make them fit for livestock consumption. Indeed, pricklypear has been utilized as a forage substitute for more than a century. However, most research has shown pricklypear to be low in protein and phosphorus but high in energy, water, fiber, and ash (Hanselka 1989).

Shoop et al. (1977) evaluated singed plains pricklypear as cattle forage in Colorado. They found that it increased total dry matter consumption and weight gain in cattle. In a chemical analysis, they found that its digestibility was at least that of alfalfa hay. It contained about 40% more soluble carbohydrates than alfalfa hay, but only about 3.4% digestible protein. The authors concluded that it was palatable and nutritious.

In general, however, the presence of pricklypear has advantages and disadvantages. In some places it forms dense stands where grass production is reduced. However, it often grows on sites that do not support a high level of grass production. An abundance of plains pricklypear has sometimes been cited as an indicator of poor range condition. Smith et al. (1985) found that its presence can reduce both the production and availability of forage, and Hyde et al. (1965) found that forage production could double where mechanical beaters had been used to control it.

Conversely, Bement (1968) measured percent cover of pricklypear after 25 years of light, moderate, and heavy cattle grazing and found little effect on the abundance of the pricklypear, concluding that "the illusion that pricklypear abundance is associated with heavier grazing is because the pricklypear in the more lightly used pastures is camouflaged by the ungrazed grass." He reported no increase in blue grama (*Bouteloua gracilis*) production after the pricklypear had been hand-clipped at the root crown, but indicated that the forage was more available for use after clipping.

Although the utility of pricklypear for use by livestock or wildlife is well illustrated, the plants can vary in their response to fire, depending on species, size, and how soon they are observed after the fire (Bunting et al. 1980). Some researchers found that small cacti are more susceptible to fire damage than the taller plants. Bunting et al. (1980) found that the Engelmann pricklypear (*Opuntia engelmannii* Salm-Dyck) was resistant to most grass fires unless there was an accumulation of fine fuels greater than 6,000 kg/ha.

Hanselka and Paschal (1991) concluded that its advantages include reduction of costs of emergency feeding during droughts and winter, lessening of soil erosion on ranges in poor condition, and various wildlife and food and habitat benefits. They also found that it had some disadvantages,

including that pricklypear by itself is not a high-quality feed, singeing pricklypear today is an expensive process, "pear-eaters" often result from feeding the plant, total forage production is lessened on pricklypear ranges, and animal health problems can occur. Wright (1972) stated that decadent stands of tobosagrass can easily be made more productive and palatable by burning during a wet spring, which will reduce the numbers of cactus plants. Furthermore, he found that in normal to wet years, two to three times more herbage is produced after burning than in the controls, and during dry years, slightly less herbage is produced than in the control.

In conclusion, pricklypear can be a significant source of forage for livestock after prescribed burning. The palatability and amount of forage supplied and unintended consequences to nontarget species will depend on the length of time after the burn it is consumed and the vegetation composition of the other plants in the plant community.

Literature Cited

Bement, R. E. 1968. Plains pricklypear: Relation to grazing intensity and blue grama yield on Central Great Plains. Journal of Range Management 21:83–86.

Bunting, S. C., H. A. Wright, and L. F. Neuenschwander. 1980. Long-term effects of fire on cactus in the southern mixed prairie of Texas. Journal of Range Management 33:85–88.

Hanselka, C. W. 1989. Developing prickly pear as a forage resource. Pages 1–9 in Hanselka, C. W., and J. C. Paschal, editors. Developing prickly pear as a forage, fruit, and vegetable resource. Proceedings,14 July 1989, Texas A&I University, Kingsville.

Hanselka, C. W., and J. C. Paschal. 1991. Prickly pear cactus: A Texas rangeland enigma. Rangelands 13(3):109–111.

Hyde, R. M., A. D. Hulett, and H. P. Alley. 1965. Chemical and mechanical control of plains pricklypear in northeastern Wyoming. University of Wyoming, Agricultural Extension Service, Laramie. Circular 185. 10 pp.

Shoop, M. C., E. J. Alford, and H. F. Mayland. 1977. Plains pricklypear is a good forage for cattle. Journal of Range Management 30:12–17.

Smith, M. A., J. L. Dodd, J. D. Rodgers, and J. Daniel. 1985. Prescribed burning on Wyoming rangeland. University of Wyoming, Agricultural Extension Service, Laramie. Bulletin 810. 25 pp.

Wright, H. A. 1972. Fire as a tool to manage tobosa grasslands. Proceedings of the Tall Timbers Fire Ecology Conference 12:153–167.

Contact

Tom Roberts
Natural Resource Specialist
Bureau of Land Management
National Science and Technology Center
Denver Federal Center
Building 50, P.O. Box 25047
Denver, CO 80225-0047
Phone: 303-236-0586
Email: *Tom_Roberts@blm.gov*