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Shaping the Cross Timbers with Fire and Grazing

By John Guretzky

Recently, our agricultural research team has been asked to provide talks during tours of our Oswalt Road Ranch. The Oswalt Road Ranch is a 4,992-acre property in Love County, Okla., willed to us by D. Joyce Coffey. The Noble Foundation took full control of the property in 2000. The ranch is a valuable piece of property because of its unique natural beauty and potential to support livestock production and wildlife habitat. On the tours, we have been showing off our new state-of-the-art livestock handling facilities and providing information about results from recent research on by-product feeds, the Noble Foundation stocker cattle receiving program, white-tailed deer movements and management of rangelands.

As a forage agronomist, I am involved in our current and future plans for the management of the range and forestland covering this property. Today, I'm going to tell you more about this property, explain why it has unique value as a native ecosystem, illustrate how it fits as a component of the natural heritage of Oklahoma, and discuss our plans for managing this property to enhance its value for wildlife and cattle, while hopefully providing some insight on how you might manage similar properties.

The Oswalt Road Ranch sits in the Cross Timbers, an ecological region stretching from southeastern Kansas to north-central Texas, and is comprised of two different vegetation types, tallgrass prairie and post oak-blackjack oak forest. Early westward-bound settlers and explorers aptly named this region Cross Timbers as they remarked on the bands of timber interspersed by bands of prairie. Native tallgrass prairie is comprised of a diversity of grasses, forbs, legumes and wildflowers. Major grasses include big bluestem, indiagrass, switchgrass and little bluestem. Indian blanket, wine-cup and indian paintbrush are wildflowers found at Oswalt. Legumes that are important for wildlife and cattle include tick-clover, purple prairie clover, partridge pea and Illinois bundleflower. In addition to post oak and blackjack oak, large trees in the forested areas include Shumard's oak, black oak and chinquapin oak. Common understory woody species include rough-leaf dogwood, sand plum, coralberry, greenbrier and sumacs.

Our goal with the Oswalt Road Ranch is to enhance this property for both wildlife habitat and cattle production, and learn something during the process to help support our education and consultation efforts. To accomplish this, we have developed an innovative long-term applied research project to evaluate the effects of prescribed burning on the compositional changes to forest and grassland, wildlife habitat, stocker

cattle gains and economics. This will build on previous research done in Oklahoma, Texas and other Great Plains states examining the effects of burning and grazing management on prairie and grassland systems.

To get a baseline of our starting point and monitor where we are going with this property, our plan is to conduct an annual vegetation survey beginning in spring 2009. Survey points will be evaluated across the many ecological sites, soil types and plant communities of the property. The survey will be conducted twice a year, in spring and autumn, to document species that complete their annual growth during cool and warm periods, respectively. We will be tracking vegetation community and forage production changes for the 10 years following the implementation of the project. From initial observations of this property, previous research and seeing other properties of similar conditions in Oklahoma and Texas, we are aware of challenges lying ahead.

Many of our tallgrass prairie sites are eroded from a history of farming and overgrazing, and are invaded by introduced species such as Old World Bluestem. Several of our upland areas have been overtaken by Old World Bluestem limiting diversity of native grasses and forbs. Other sites are dominated by forbs such as western ragweed and annual broomweed. These species are valuable from a diversity standpoint, but not when they blanket and dominate a field.

One of our largest problems, however, is the domination and encroachment of eastern red cedar in our forested and grassland communities. Eastern red cedar is a native species and has always been part of the landscape, but the suppression of fire has allowed it to flourish.

Restoration of functioning native rangelands is a priority to us in the Agricultural Division. Their value as low-input forage resources supportive of biodiversity and capable of holding and building soils is often neglected and unrecognized. By enhancing these systems for wildlife and cattle, we will find better ways to protect their natural value and educate others throughout the southern Great Plains on ways to do the same.

An important component to restoration of this property is the introduction of fire. We are planning to rotate prescribed burns around this property annually while leaving some areas unburned to compare the effects of fire on the forest and range plant communities. Sites that are designated to be burned will be burned every three years in February or March. The burns will be safely conducted by a research support staff that is trained in the proper procedures of prescribed burning. Research in Oklahoma has shown that the season of burning affects the intensity of the fire and, consequently, can have some effects on vegetation compositional changes. It is my opinion that simply introducing fire to these sites, regardless of the season, is important to maintaining the integrity of these natural landscapes. Hopefully, burning of these landscapes will reduce the accumulation of brush and cedars, and enhance the quality of the grasslands for forage and wildlife habitat.

Proper grazing management is also a crucial component of managing these landscapes, and having the correct stocking rate is the most important factor in grazing management. We generally stock conservatively, following the rule of "take half-leave half." We allow half of the yearly forage production to be consumed or lost through trampling by the combination of cattle, wildlife and insects. The other half of the forage is conserved to allow for the maintenance and vigor of the grasses, while sustaining and holding productive soils in place.

Once a proper stocking rate is set, how one manages the distribution of livestock is the producer's preference. Rotational or continuous stocking can be used. Most research shows that both systems are sustainable and do not have drastically different effects on plant communities if stocking rates are appropriate. On the Oswalt Road Ranch, we will be grazing stocker cattle from mid-April to mid-July. This will allow us to match nutritional needs of young lightweight animals to growth of high quality forage in early spring and summer, and provide us data on how our vegetation management activities affect animal performance. One could also use a cow-calf production system on these rangelands.



A long-term research project on the Oswalt Road ranch will evaluate the effects of prescribed burning on forest and grassland.

A final consideration when managing these Cross Timbers is what to do about all those cedar trees. We feel that under conservative stocking rates, where we allow vegetation to accumulate and plant litter to build up, we will be able to get effective burns to kill the young cedar trees that have sprouted and begin to beat back those at the margins of our forest and grasslands. Although burning has been shown to be a crucial aspect to maintaining majestic prairies and savannas in the Great Plains, we realize that burning is not always popular and practical. Mechanical control, through use of heavy equipment on a large scale or a chainsaw on a small scale, is a possible alternative. Regardless of the method, cedars will continue to increase in number and diminish our native grasslands unless we take action to solve this land management challenge.

I hope I have provided you some insight to our native grasslands and heritage in Oklahoma and north-central Texas and thoughts on how to manage similar properties you might be in charge of. In summary, I can't emphasize enough the importance of proper stocking rates and use of fire as a tool to shape these landscapes.



This photo shows the positive effects on a grazing area after a prescribed burn. Please note the eastern red cedar trees killed by the fire at the back of the pasture.