

NOBLE NEWS & VIEWS



By every definition, Jimmy epitomizes the cooperator relationship established in the early 1950s.

PRODUCER RELATIONS

Jimmy Kinder Recognized for Willingness to Share Ag Experiences

by Hugh Aljoe, director of producer relations | hdaljoe@noble.org



In 2004, the Noble Research Institute (then known as the Noble Foundation) established an award to recognize its outstanding cooperators.

The award is called the Leonard Wyatt Memorial Outstanding Cooperator Award in honor of a man who exemplified what the term “cooperator” implies – an agricultural producer who has an active relationship with the Noble Research Institute consultants and demonstrates superb operational proficiency and willingness to share his or her experiences and expertise with other producers. Mr. Leonard Wyatt was posthumously recognized as the first award recipient, and Noble Research Institute consultants have continue to nominate deserving cooperators who exemplify the standard he set. There have been 15 recipients over the last 18 years.

This year, the Noble Research Institute is pleased to recognize Mr. Jimmy Kinder of Walters, Oklahoma, as the 2018 recipient of the Leonard Wyatt Memorial Outstanding Cooperator Award.

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And this year's Leonard Wyatt award goes to ...

JIMMY KINDER

Jimmy Kinder and his wife, Margaret, have been cooperators with the Noble Research Institute since 2007. Kinder operates 5,000 acres in Cotton County, Oklahoma, as a diversified farming operation in which he raises about 1,500 head (or more, depending on season) of stocker cattle and grows wheat, canola, sesame and grain sorghum.

Kinder was an early adopter of no-till farming practices and remains an avid investigator and adopter of farming technologies that add value to his operation. Kinder has hosted crop variety test demonstrations for Oklahoma State University and Noble, and he continues to investigate cover crops as a component in his cropping system. Kinder remains a continual learner; he is willing to attempt new management practices or try novel technologies that demonstrate potential; and he mentors other producers and students, who often visit his operation.

Kinder has served his community at the local and state levels. He is active in his local church and in community organizations as well as being actively engaged in the Oklahoma Farm Bureau, for which he served as a district director for many years. Kinder also served the Noble Research Institute as a nonresident fellow for eight years, providing direction and support to the consultants and agricultural researchers. Kinder continues to remain active with our consultants in his operational planning and contributes to the education of other interested producers by sharing his experiences and knowledge.

By every definition, Kinder epitomizes the cooperator relationship established in the early 1950s. The Kinders were honored before their peers at the Noble Research Institute 2018 Texoma Cattlemen's Conference on Friday, June 15, 2018.



Jimmy Kinder received the 2018 Leonard Wyatt Memorial Outstanding Cooperator Award alongside his wife, Margaret Kinder, and mother, Trudie Kinder, during the 2018 Texoma Cattlemen's Conference on June 15, 2018. Pictured, from left, are Margaret Kinder; Jim Johnson, soils and crops consultant; Jimmy Kinder; Robert Wells, Ph.D., livestock consultant; and Trudie Kinder.

**Past
award
winners**

**Wyatt
Family,
2002**

**Steve
Jones,
2003**

**Dave and
Brenda
Wingo,
2005**

**Tom and
Pat
Loftin,
2006**

**Yates
and
Nancy
Adcock,
2007**

**Michael
and Julie
Campsey,
2008**

**Jack
Cunningham
and Jack
Cunningham
Jr.,
2009**

**Jeffrey
and
Melinda
Reuter,
2010**



Learn more about Jimmy Kinder at youtu.be/vRzGDN19zGI



I've had a passion for farming and agriculture for as long as I can remember."

JIMMY KINDER



ABOUT LEONARD WYATT

Leonard Wyatt set the example of what the term “cooperator” implies during the entire five decades he was one. During the 1950s and '60s, Wyatt spoke at educational events with Noble consultants about small grains establishment and grazing with stocker cattle when this production practice was novel to the cattle industry. He also hosted many events on his operation, sharing what worked well for him and what did not. Wyatt would even open his cattle records and financial data to anyone interested as he always desired to help other producers in their search for knowledge. Wyatt never ceased to search for knowledge himself. He continually invited the Noble consultants to at least an annual farm visit to review the operation and to discuss new and emerging science and technologies that he should consider implementing. He was the ultimate Noble ambassador throughout his life, so it was only fitting to name the outstanding cooperator award after him. Wyatt was the first recipient with his family accepting it posthumously on his behalf in 2004. 🇺🇸

Pete and Rose Hammert III, 2011

Kent Moore, 2012

Carroll Collier, 2013

Kent Donica, 2014

Robert Smith, 2016

Craig Watson, 2017

Jimmy and Margaret Kinder, 2018

WILDLIFE

Improve Nutrition for White-Tailed Deer With Growing-Season Prescribed Burns

By Will Moseley, wildlife and fisheries consultant | wamoseley@noble.org



Habitat includes food, water, shelter, space and the arrangement of these components, though land managers and popular press most popularly discuss food. Food can easily be managed, and many times the focus is only on food plots

and feeders. Native vegetation can take a back seat to these intensive management practices, but people should be aware how to manage existing native vegetation to provide a high quality diet.

SUCCESSFUL DEER SEASON IN BURNED AREA LEADS TO QUESTION ABOUT NUTRITION

An idea for a project began one October day while scouting where to put up deer hunting blinds. We had conducted a prescribed burn in August, and there were

thousands of greenbrier sprouts about 6 to 10 inches tall in the burned area. When I came back a few weeks later to hunt, almost every sprout was browsed and deer tracks were everywhere.

It ended up being a successful hunting season in the burned site because deer seemed to select this site due to the food source. It got me thinking about the sprout quality. Greenbrier was abundant just across the fireguard, but deer didn't seem to select for them outside the burn.

THE PROJECT

I initiated a demonstration project to better understand the role growing-season fire plays in the nutritional quality of woody plants.

I sampled five important deer browse species – greenbrier, poison ivy, Chickasaw plum, smooth sumac and rough-leaf dogwood – once per month from April to October. I tried to mimic how a deer would browse and hand-picked only the parts of the plants I thought were the most succulent and fresh during each

sample period. I sampled two different locations close to each other: one area that was not burned and one area burned during the growing season. A growing-season burn was conducted on July 13, after our July sample period. Each sample was analyzed with wet chemistry to determine the crude protein (CP) and total digestible nutrients (TDN).

PLANT QUALITY RESULTS

In all of the plants, fire appeared to have had no impact on TDN. However, fire did have a positive impact on CP for all of the browse species except for dogwood (see charts). Plum, greenbrier, sumac and poison ivy all had an increase in CP in the burned area compared to the unburned area. Greenbrier had the largest difference between the two areas with the unburned plants having 9 percent CP and the burned plants having 27 percent CP one month after the burn. However, the CP increase did not last long. Plum and poison ivy had similar CP levels between the burned and unburned areas two months



after the burn. Burned greenbrier and sumac still had higher CP levels compared to the unburned plants two months after the burn. Three months after the burn, all plants had similar CP levels between the burned and unburned treatments.

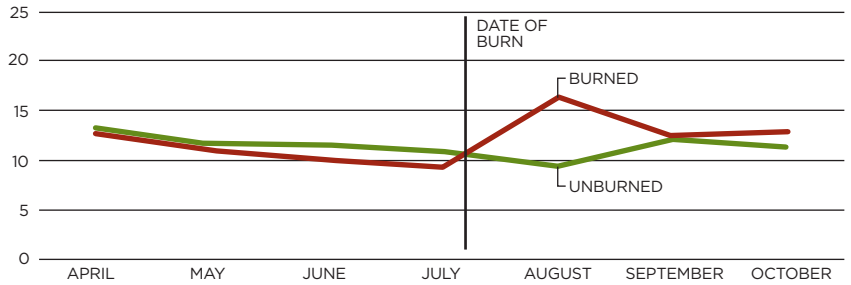
WHAT THIS TELLS US

This was a demonstration project that was not replicated and was only conducted during one growing season on one ecological site. However, I would expect a similar trend on other ecological sites across multiple years. This information is important to deer managers because CP demands are usually highest in spring to late summer for antler growth, lactation and fawn growth. All five species of unburned plants fell below 14 percent CP by June, which is below requirements for antler growth (16 percent) and lactation (14 percent). However, most burned plants had CP levels above 16 percent after the burn in July.

This project indicates the best management is to burn different areas every month to provide a high level of nutrition throughout the growing season. When there is always a freshly burned area, deer have access to high levels of nutrition throughout the growing season to meet their needs. Burning several areas throughout the growing season also increases plant diversity, which is imperative to deer management. 🐾

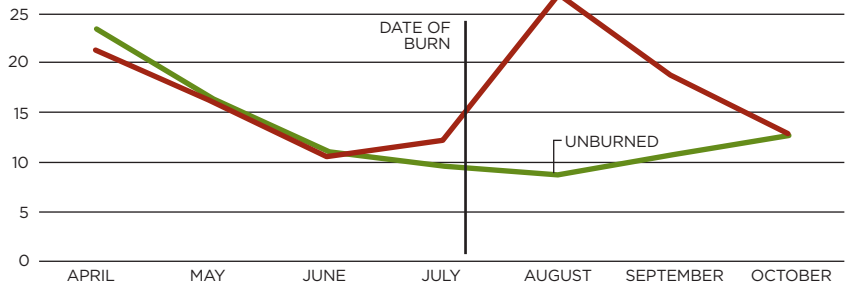
PLUM CRUDE PROTEIN

PERCENT OF CRUDE PROTEIN



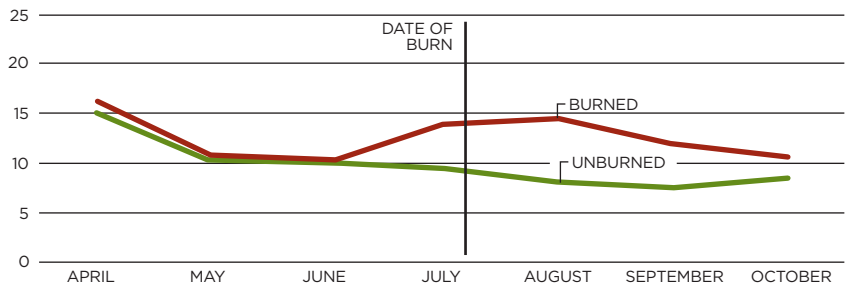
GREENBRIER CRUDE PROTEIN

PERCENT OF CRUDE PROTEIN



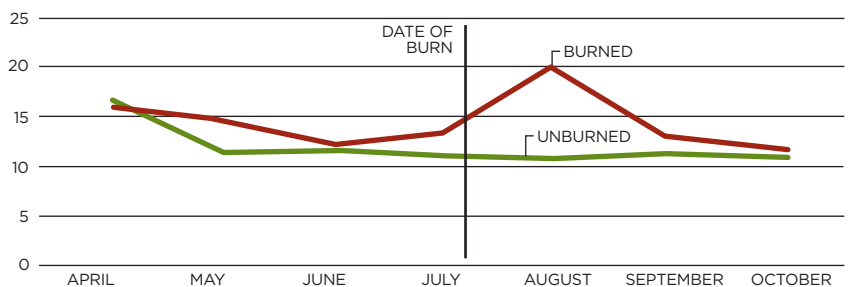
SUMAC CRUDE PROTEIN

PERCENT OF CRUDE PROTEIN



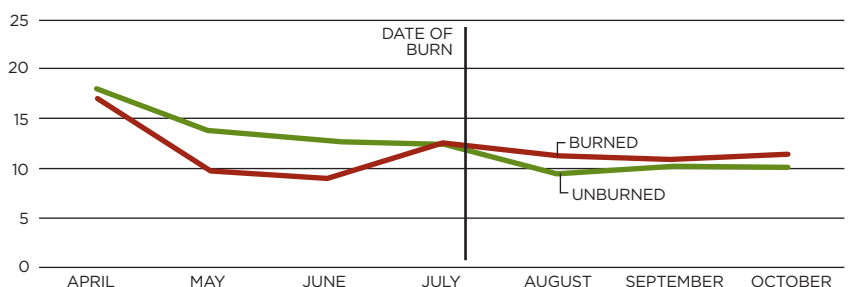
POISON IVY CRUDE PROTEIN

PERCENT OF CRUDE PROTEIN



DOGWOOD CRUDE PROTEIN

PERCENT OF CRUDE PROTEIN





AG SYSTEMS

Hay Rakes Can Help Build Better Firebreaks

by Frank Motal, range ecology and technology research associate | fjmotal@noble.org



Many decisions go into planning a safe and effective prescribed burn that meets your management goals. You will need to determine your burn objectives and consider the weather as

well as personnel and equipment needs. You'll also need to prepare firebreaks, something that ranks high on the list to safely conduct a burn.

CREATING MOWED FIREBREAKS

You can use several types of firebreaks with effectiveness, but you will need to more carefully monitor mowed breaks for smoldering or for fire creeping across than you would bare soil or gravel breaks.

When mowing with a brush hog, the clippings are not discharged to the side like a lawn mower. They are usually discharged toward the rear and back onto the firebreak. This creates difficulty in controlling your fire because the clippings dry out, are near the

flames and can ignite easily from embers.

If mowed early and often enough, the clippings will break down and decompose, decreasing any potential problems. Let's face it, though, sometimes we get behind and don't mow early or often enough to mitigate litter and thatch issues, during dormant- or growing-season burns.

HOW HAY RAKES CAN HELP

A side-discharge hay rake will help by making mowed firebreaks better for fire containment. At Noble, we put an old hydraulic side-discharge hay rake back into service just for raking fireguards. You can use a ground-driven rake as well, but it may be a little rougher riding in the tractor since speed is needed to make the reel work properly.

For dormant-season burns, you only need to rake once if you have mowed after the plants go dormant. When conducting a growing-season burn, you may need to mow and rake multiple times if the burn is not done soon after the first mowing and raking.

Since using the hay rake, it has been easier for us to extinguish and control flames along our mowed firebreaks. We observed that raking the firebreaks:

- Removed excess material that could smolder and reignite by moving the litter farther away from the fireline.
- Made it easier to walk and control fire when conducting the prescribed burn.
- Removed thatch to expose multiple, small spots of bare soil.
- Made the wet-lining technique more effective.

Two minor disadvantages are that fresh-cut litter does not rake well unless it is allowed to dry for a couple of days after mowing and that a rake does not work well in leaf litter.

FINAL THOUGHTS

Raking firebreaks with hay equipment may be out of the ordinary, but for us it has been very useful and will continue to be used in preparing our firebreaks.

If you practice prescribed burning and own a hay rake or can borrow one, think about putting it to use when not baling hay. It will be worth the time and effort when you are ready to conduct your prescribed burn. 🐮

PASTURE

3 THINGS TO KNOW

When Using Both Fire and Grazing on the Ranch

By Rob Cook, pasture and range consultant | rwcook@noble.org



Can prescribed fire be used along with livestock grazing? The short answer is yes. Many land managers incorporate prescribed fires into a management plan alongside grazing livestock. Other land managers feel it is not

feasible to graze and burn on the same operation. But when prescribed fire is used strategically, its benefits outweigh any negatives. In fact, the removal of fire in the Southern Great Plains over the last century has resulted in increased brush densities, which reduces forage production and grazeable acres.

Prescribed fire can be a relatively inexpensive tool to accomplish several management goals. However, fire must be used correctly to avoid poor results or negative impacts. It is just as important to have the correct stocking rate. Forage production must be matched with animal demand for a livestock grazing operation to be successful whether or not a prescribed fire plan is implemented.

1 SOIL MOISTURE AT THE TIME OF A BURN IS THE KEY TO REDUCING RISKS FROM FUTURE DROUGHT.

One reason managers give for not using prescribed fire is the fear of a drought after the fire. While this is certainly a valid concern, we can take actions to mitigate the risks.

Burning during a drought might not be wise due to a higher probability of negative impacts on forage production and animal performance.

Although we can do some weather forecasting, we have no control over how much it will rain after a prescribed fire. We do have control over the conditions under which we burn, however.

Conducting a burn when soil moisture is good is the most effective way to reduce the effects of a dry spell after the burn. Soil mois-



ture at the time of the burn is the most important factor affecting forage recovery after the fire.

2 STUDIES SHOW THAT PRESCRIBED FIRE INCREASES FORAGE QUALITY AND DOES NOT REDUCE FORAGE PRODUCTION.

Some grazing managers will not use prescribed fire because they believe it will reduce forage production and in some cases kill warm-season grasses such as little bluestem. However, the study "Growing-Season Disturbance in Tallgrass Prairie: Evaluating Fire and Grazing on *Schizachyrium scoparium*," conducted by R.F. Limb, S.D. Fuhlendorf, D.M. Engle and J.D. Kerby and published in the *Journal of Rangeland Ecology & Management* in 2011, showed that burning actually increased the above-ground regrowth and the below-ground biomass of little bluestem. The study "Prescribed Fire, Grazing, and Herbaceous Plant Production in Shortgrass Steppe," conducted by D.J. Augustine, J.D. Derner and D.G. Milchunas and published in the *Journal of Rangeland & Ecology Management* in 2010, showed that dormant-season prescribed burns in shortgrass steppe had no negative effect on above-ground herbaceous production.

Both of these studies showed that there was no reduction in forage regrowth after a fire and that the regrowth was higher in quality. This could lead to an increase in animal performance. Both studies also suggested that grazing immediately after a prescribed fire would not cause long-term reductions in forage production and that a full growing season deferment after a prescribed burn is normally not justified.

Immediately after a fire, livestock will graze plants they normally would not. This helps not only to increase grazing distribution and utilization but also to amplify the fire's effect

on species composition. In addition, grazing impacts on brush regrowth have been shown to improve brush suppression.

3 PATCH BURNING CAN BE A GOOD OPTION FOR BALANCING GRAZING AND FIRE.

Grazing managers can burn smaller areas within pastures as an alternative to burning entire pastures. This is sometimes referred to as patch burning.

Patch burning can help increase the compatibility of prescribed fire with livestock grazing. Research has shown that there is usually no reason to defer grazing after a fire. Burning small areas, or patches, within pastures on a rotation will lead to livestock concentrating in recently burned areas within individual pastures and not grazing unburned areas within the same pasture.

These patch burn rotations will allow for long periods of rest from grazing. Growing-season rest is an important practice to help improve grazing land health and will result in a large amount of standing forage in unburned areas. This forage becomes fuel for the next burn and is accumulated without the deferment of an entire pasture. It can also be used as stockpiled forage for grazing during drought situations, when a prescribed fire might not be conducted. Burning only part of a pasture will ease concerns related to grazing management, allow for fuel accumulation and should also reduce the risk associated with drought after a prescribed fire.

Burning patches in the same pastures during different years will also lead to the patches having different levels of regrowth and recovery. This will increase the biodiversity of the pasture and result in an appearance that is not uniform. Some grazing managers might see this un-uniform appearance as messy, but others see it as a sign of biodiversity and a healthy ecosystem. 🐄



EDUCATION

Find Out Why and How to Burn at Great Plains Fire Summit

By Russell Stevens, strategic consultant manager | rlstevens@noble.org



Our native ecosystem in the Southern Great Plains evolved with the impacts of fire. To the soils, plants and animals that comprise our native ecosystem, fire is as natural as sunshine and rain.

NO FIRE, MORE PROBLEMS

Fire suppression over the past century or so is causing many negative impacts. The spread of eastern red cedar is nothing more than a “green dust bowl” engulfing many areas of the Southern Great Plains. Fire suppression has also reduced habitat for numerous wildlife species, especially prairie-obligate and pollinator species. It has reduced livestock forage production

and watershed quality, and it has degraded human health due to increased pollen activity and increased wildfire threats. One needs to look no farther than western Oklahoma, Kansas and Texas for examples of tragic wildfires over the last few years. Additionally, with the absence of fire over time, native plant structure and diversity becomes unsuitable for supporting numerous wildlife species and livestock.

Despite the fact that fire is integral to our native ecosystem, it is not readily used across the majority of the Southern Great Plains. Fear of liability and lack of education, training and equipment prevents most landowners from applying fire to their property. The need for more fire is an issue that should take priority across the Southern Great Plains in order to bring benefits not only to landowners but also to our native ecosystem, which benefits all citizens. 🐾

Join Industry Professionals at the Great Plains Fire Summit Oct. 1-3

The Noble Research Institute, Oklahoma State University and the Texas A&M Natural Resources Institute are partnering to bring the 2nd Biennial Great Plains Fire Summit to Ardmore, Oklahoma, on Oct. 1-3, 2018. The purpose of the Summit is to promote the use of prescribed fire by creating an opportunity for landowners, agencies and nongovernmental organizations to network and discuss the benefits and effectiveness of prescribed burning for the sustainability of our plant, livestock and wildlife resources.

The opening plenary session of noted speakers will set the stage for breakout sessions that will cover prescribed fire prescriptions, planning, smoke management, wildlife impacts and livestock production. You will have the opportunity to see an equipment demonstration during the social on the first evening and to tour Edgerock Ranch in the Arbuckle Mountains on the second day. At Edgerock Ranch, you will learn how fire is being used to improve the land for livestock and wildlife.

Mark your calendar now in order to make plans to attend this important and informative event.

SUMMIT REGISTRATION COST:
PRODUCER: \$50
PROFESSIONAL: \$100



Find out more about the Great Plains Fire Summit online at bit.ly/gp-fire-summit



FORAGE

Growing-Season Burns Hold Potential for Fall and Winter Forage

50 days after a prescribed burn, the land is experiencing a renewed growth.

By Steven Smith, wildlife and fisheries consultant | sgsmith@noble.org
 Ryon Walker, Ph.D., livestock consultant | rswalker@noble.org



The traditional burning season for the Southern Great Plains goes from December to April. However, when land managers limit their burn season to these five months, they often find it difficult to implement the number of burns needed to achieve their goals. Typically, weather during the traditional burn months

is somewhat turbulent because of fronts moving in and out of the area. These fronts cause the wind to frequently change direction, leaving small windows for burning. This is one reason why more and more land managers are conducting growing-season burns, during late spring through early fall months, to meet some of their prescribed burning goals. Weather during the summer months is warmer with higher humidity and typically has more consistent wind patterns.

Regardless of the burn season, a major goal of prescribed burning is to improve forage quality for livestock and wildlife habitat.

EXAMPLE OF FORAGE QUALITY AFTER GROWING-SEASON BURN

On Sept. 7, 2017, a Noble Research Institute cooperator conducted a prescribed burn in

Murray County, Oklahoma. The main goal for this burn was to control encroaching eastern red cedars in a pasture where little bluestem was the dominant grass. As is typical with good soil moisture, forage regrowth occurred relatively quickly and resulted in greater forage quality.

Out of curiosity, we began collecting forage samples of the regrowth and of the unburned little bluestem every three to four weeks after the September burn to evaluate changes in forage quality over time and into the dormant season. We wanted to learn whether the regrowth of native grasses would provide a nutrition level high enough to meet a mature dry cow's daily nutrient requirement.

Three weeks post-burn, little bluestem regrowth had a crude protein (CP) concentration of 20 percent while the



unburned samples were 4.8 percent. Crude protein levels of the regrowth remained above 8 percent until December, while the unburned mature little bluestem never exceeded 6 percent during the sampling period.

REDUCING NEED FOR HAY

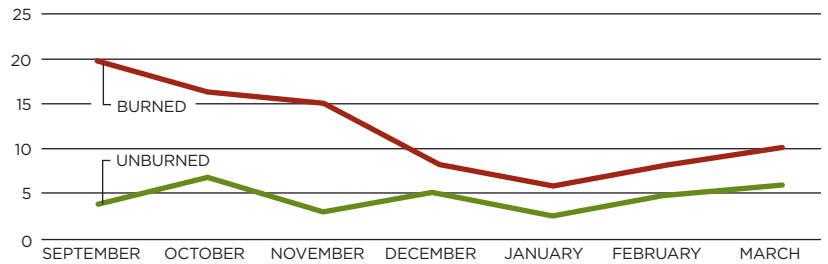
Data and information collected from Oklahoma State University, The Nature Conservancy and this cooperator has prompted us to learn more about burning native rangeland during the growing-season and its effects on forage quality and yield into the winter.

If adequate yield and forage quality exists during the dormant season, producers may be able to extend the grazing season and shorten the number of days they need to feed hay and/or supplement. However, stocking rate is expected to be lower.

With beef cattle, we have the flexibility to match class of cattle or production stage with available forage quality due to their range of protein and energy requirements. For example, the lowest nutrient demand for maintenance requirements comes from a mid-gestation, nonlactating mature beef cow where CP requirements are 7 percent and total digestible nutrient (TDN) requirements are 45 percent. However, the highest nutrient demand comes from a lactating first-calf heifer, where CP is 10.8 percent and TDN is 70 percent. Knowing this, a producer could reduce feeding costs by giving the portion of the herd with the highest nutrient demands priority to grazing burned areas. 🇺🇸

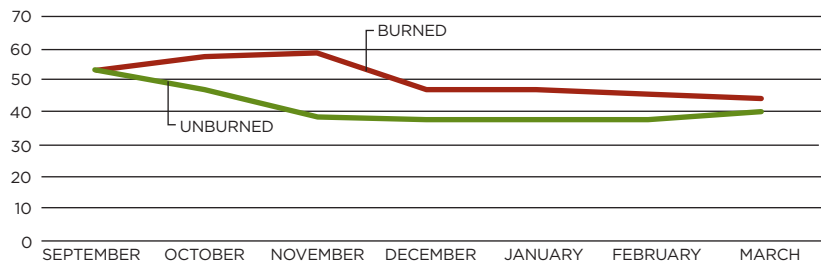
CRUDE PROTEIN (%) OF LITTLE BLUESTEM

BURNED SEPT. 9, 2017



TOTAL DIGESTIBLE NUTRIENTS (%) OF LITTLE BLUESTEM

BURNED SEPT. 9, 2017

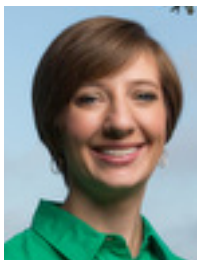




ECONOMICS

Evaluating the Most Economic Way to Improve Rangeland

By Myriah D. Johnson, Ph.D., economics program lead and agricultural economics consultant | mdjohnson@noble.org



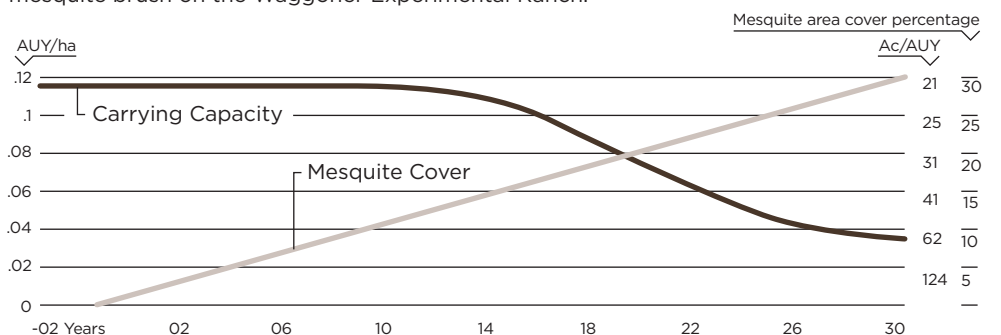
On many agricultural operations, there are always projects to work on. Some are pertinent and necessary for the operation to continue functioning, while others are “get to it when you can” or “would be

nice to do” types of projects. Often, range management or improvement projects fall in the nonessential category until they reach a critical point. Along the way, these projects may be continually pushed to the back

Continued on next page

FIGURE 1. EFFECT OF MESQUITE BRUSH ON CARRYING CAPACITY

Carrying capacity declined with time from a completely cleared situation, due to increasing mesquite brush on the Waggoner Experimental Ranch.*



*Source: McMullen 2000, Ansley et al. 2001



burner for many reasons, such as shortages in time, labor or capital. However, it is best to consider whether there is a financial incentive (or penalty) for waiting until there is a critical mass to address this type of project.

INCREASED BRUSH REDUCES REVENUE

For this article, we will focus on what would happen to a range pasture if mesquite was not managed over a 30-year time period.

The article “Economics of Managing Mesquite in North Texas: A Sensitivity Analysis,” written by W.R. Teague, R.J. Ansley, U.P. Kreuter, W.E. Pinchak and J.M. McGrann and published by the *Journal of Range Management* in 2001, lends itself to this idea. Figure 1, which is from their paper, depicts the tradeoff between carrying capacity and acres per animal unit (AU) with percent mesquite coverage. An area completely clear of mesquite is assumed to start with. This clear land will support slightly less than 0.12 animal unit years (AUys) per hectare (or slightly more than 21 acres per AUy).

For the first 15 years or so, mesquite coverage slowly increases to about 15 percent and only a minimal decrease in AUys per hectare occurs (or a minimal increase in the number of

TABLE 1. RANGELAND MANAGEMENT COST ESTIMATES FOR 1,000 ACRES DURING 30-YEAR PERIOD.

The bolded values represent the options that cost less than the lost revenue value of \$165,000.

Individual Management Options	Prescribed Fire	Aerial Treatment	Individual Plant Treatment	Grubbing
Cost	\$11,662	\$130,000	\$80,000	\$700,000
Combination Management Options	Aerial Treatment and Prescribed Fire	Aerial Treatment and Individual Plant Treatment	Grubbing and Prescribed Fire	Grubbing and Individual Plant Treatment
Cost	\$44,123	\$100,500	\$186,623	\$243,000

acres per AUy). However, in years 15 to 30, as mesquite coverage increases from approximately 15 percent to 30 percent, we observe a steady decline in carrying capacity to less than 0.04 AUys per hectare (or more than 62 acres per AUy). During these 30 years, there is a reduction in grazeable acres and carrying capacity.

Because fewer head of livestock can be supported, fewer pounds of livestock produc-

tion per acre are sold. In addition, this creates a loss in revenue, leaving a producer with fewer dollars to pay for this type of range management. Further, there is an increase in the production cost per unit of livestock.

CONSIDER LOSS OF REVENUE WHEN EVALUATING PRACTICES

None of the aforementioned consequences



are desired, but how does one justify implementing the management practices needed to avoid this situation? One way to look at this is to think of the potential lost revenue from not managing the rangeland.

We will assume there are 1,000 acres in the operation and that 500-pound calves are weaned and sold each October. If the cows weigh 1,100 pounds, on average the 1,000 acres will support 41 cows total (24 acres per cow). With an 85 percent weaning rate, there would be 35 calves to market each fall. As discussed previously, this herd size could be supported for the first 15 years or so. At year 18, we assume the operation can support 33 cows with 28 calves to market; at year 23, 22 cows and 18 calves; at year 28, 16 cows and 13 calves; and finally, at year 30, 14 cows and 11 calves.

To calculate the loss in revenue, we compare the pounds that would have been marketed if the land was clear to the pounds marketed when the carrying capacity is decreased. For example, take the 18 calves, instead of 35, marketed at year 23. Assume a calf crop of 50 percent steers and 50 percent heifers. Using Oklahoma City market prices from 2000 to 2017 for 500- to 600-pound steers and heifers, it is estimated that approximately \$165,000 in revenue would be lost.

CALCULATE COSTS FOR MANAGEMENT OPTIONS

So, what options are available for mesquite control that would be less costly than losing out on \$165,000 in revenue?

We estimated the costs of several management methods to answer this question. The methods included prescribed fire, aerial treatment, individual plant treatment (IPT) and grubbing as well as the combination of aerial treatment and prescribed fire or IPT and the combination of grubbing and prescribed fire or IPT. We assumed these man-

agement practices were started in year 13, just before destocking would begin. By implementing these practices, destocking would not be needed. The following calculations are rough estimates based on the Noble agricultural consultants' knowledge.

PRESCRIBED FIRE

Initial startup cost of \$10,960 for a sprayer, fire guards and other supplies.

We assumed 200 acres would be burned each year with an annual cost of \$39.

Total cost over 30-year period: \$10,960 + (\$39 x 18 years) = \$11,662

One consideration for prescribed fire is that mature trees at high densities could lead to less-than-desirable suppression levels and not result in an increase in carrying capacity.

INDIVIDUAL PLANT TREATMENT (IPT)

\$20,000 every five years, four treatments in 18-year time frame.

Total cost over 30 years: \$20,000 x 4 = \$80,000

IPT can be cheaper at lower canopy and density levels but may be less feasible at higher density levels and with more mature trees. Also, cut and spray may be the only IPT option when trees are larger.

AERIAL TREATMENT

\$32,500 every five years with four treatments in an 18-year time frame.

Total cost over 30 years: \$32,500 x 4 = \$130,000

AERIAL TREATMENT FOLLOWED BY PRESCRIBED FIRE EACH YEAR

Add one-time cost for aerial treatment (\$32,500), plus prescribed fire startup cost (\$10,960) and annual burn cost (\$39) for 200 acres.

Total cost over 30 years: \$32,500 + \$10,960 +

(\$39 x 17 years) = \$44,123

AERIAL TREATMENT FOLLOWED BY IPT EACH YEAR

IPT annual cost: \$20 per acre x 200 acres per year = \$4,000

Total cost over 30 years: \$32,500 + (\$4,000 x 17 years) = \$100,500

GRUBBING

\$175,000 every five years, four treatments in an 18-year time frame.

Total cost over 30 years: \$175,000 x 4 = \$700,000

GRUBBING FOLLOWED BY PRESCRIBED FIRE EACH YEAR

Add one-time grubbing cost (\$175,000), plus prescribed fire startup cost (\$10,960) and annual burn cost (\$39) for 200 acres.

Total cost over 30 years: \$175,000 + \$10,960 + (\$39 x 17 years) = \$186,623

GRUBBING FOLLOWED BY IPT EACH YEAR

Add one-time grubbing cost (\$175,000), plus IPT annual cost (\$4,000) for 200 acres.

Total cost over 30 years: \$175,000 + (\$4,000 x 17 years) = \$243,000

In total, there are eight different management options ranging in cost from about \$11,662 to \$700,000. In Table 1, the bolded values represent the options that cost less than the lost revenue value of \$165,000. Five options meet the threshold. Prescribed fire is the cheapest at \$11,662. It is followed by the combination of aerial treatment and prescribed fire, then IPT, then aerial treatment and IPT, and finally aerial treatment, with an approximate cost of \$130,000. Some producers have suggested the prescribed fire cost is double what is assumed here. Even at double the cost, prescribed fire remains the most economical option.

FOUR ECONOMIC CONSIDERATIONS

First and foremost, you must have the cash on hand to implement the management practices discussed in this article. Just because you stand to lose revenue does not necessarily mean you have the cash on hand to implement the practices. So, you should consider setting cash aside for range management practices.

You should also consider the fact that the costs to implement any of these practices may increase with deferment. As always, the pencil and paper must come together to determine the implementation costs for any of these practices on your operation.

Also, check with your local Natural Resources Conservation Service office to determine whether any funding assistance is available.

Last, consider whether you can afford to defer implementing management practices or suffer the loss in your future income stream.

Rob Cook, pasture and range consultant; Will Moseley, wildlife and fisheries consultant; Steven Smith, wildlife and fisheries consultant; and Brian Hays contributed information to this article. 🐾



PECANS

How to Identify and Control Pecan Aphids

By Will Chaney, pecan and specialty agriculture systems senior research associate | jwchaney@noble.org



Three aphid species can prove problematic in pecans: black pecan aphids and two species grouped together in what is referred to as the yellow aphid complex, or simply yellow aphids.



Black Pecan Aphid

Phil Mulder, Ph.D., Oklahoma State University



Yellow Aphid Complex

BLACK PECAN APHID

Black pecan aphids cause more damage to the tree than the yellow aphid complex. They cause yellow, angular, chlorotic spots between leaf veins, which can lead to defoliation in late summer. This aphid species can be found on the top and bottom of the

leaves. Females give birth to live young in the summer and deposit eggs that overwinter on the bark of the trunk.

YELLOW APHID COMPLEX

This complex comprises the black-margined aphid and the yellow pecan aphid. The difference can be seen in the wings. Black-margined aphids hold their wings flat over their back, while yellow pecan

aphids hold their wings like peaked roofs over their back. Both species are normally found under the leaf. In both species, females give birth to live young in the summer and deposit eggs that overwinter on the bark of the trunk.

WHAT'S THAT YELLOW SAP?

Have you noticed a sticky substance under your pecan trees? Some people refer to

One thing to consider if you plan on using a cover crop is whether your orchard or grove is grazed or not. Some ground covers can pose a problem for cattle while others have no problem.

this substance as sap. However, it is a sticky, sugary substance known as honeydew and is produced by the aphids of the yellow aphid complex.

START SCOUTING IN SPRING

In spring, you should start scouting if you notice honeydew in your orchard. If you spot more than 25 yellow complex aphids per compound leaf or more than two black aphids per compound leaf, then control is needed. This is the recommended economic threshold in southern Oklahoma and northern Texas.

Two things to keep in mind while scouting:

1. Is your beneficial insect population high? If so, they may be able to control the population.
2. Is a significant rain in the forecast soon (within the week)? The soft aphid bodies are no match for the rain storms of the Plains. Not only will your population dramatically drop after a rain event, the rain will also help wash off the honeydew.

BIOLOGICAL CONTROL OPTIONS

Biological control of pecan aphids can be accomplished through a few different orchard management options. Most of these controls are long-term investments. You should also be aware that these controls build over time and are not an overnight solution. Biological controls also don't prevent the use of insecticides, but the system works best when you don't use broad-spectrum insecticides. Instead, use targeted insecticides for specific pests.

COVER CROPS

Plant cover crops in the orchard. Cover crops can be used in your orchard to support a diverse insect population. Legumes such as clovers, alfalfa, sainfoin and hairy vetch not only fix nitrogen and support soil health, but alfalfa alone supports roughly 150 known parasitoid and predator species. Small grains can also be used as a cover crop. Parasitoids and predator species are known as "beneficials" because they consume the insects that do damage in your orchard. In this case, as the cover crop blooms throughout the season, aphids will



Bill Ree, Texas A&M

BLACK-MARGINED APHID AND YELLOW PECAN APHID

Specific Wasp Parasitoids

Aphelinus peri pallidus and *Trioxys pallidus*

General Predators

Lady beetles: *Hippodamia convergens* (Convergent lady beetle), *Olla v-nigrum* (Ash gray lady beetle), *Harmonia axyridis* (Asian lady beetle), *Coccinella septempunctata* (Seven-spotted lady beetle), *Chilocorus stigma* (Twice-stabbed lady beetle)

BLACK PECAN APHID

General Predators

Lacewings: *Chrysoperla carnea*, *Chrysopa rufilabris*, *Chrysopa nigricornis*

CHEMICAL CONTROL

Broad Spectrum	Target-Specific Option
Admire	Nicotinyls (imidacloprid or thiamethoxam)
Ammo	Pyriproxyfen
Battalion	
Closer	
Provado	
Pasada	Organic Option
Warrior II	Surround WP Kaolin Clay
Mustang Maxx	
Lorsban	

increasingly draw lady beetles. If you get a buildup of your targeted pest, you can also cut your cover crop and drive the beneficials into the trees and surrounding area.

One thing to consider if you plan on using a cover crop is whether your orchard or grove is grazed or not. Some ground covers can pose a problem for cattle while others have no problem.

INSECTARIES

If you don't want a cover crop under your trees, you can plant cover crops around the orchard edge or fill in unsuitable spaces with the crops and let them grow to attract the beneficials. This method creates a trap crop that houses a multitude of insects that prey on the aphids you want to remove from your orchard. 🐜

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SEPT. 6
Backyard Farming: Intensive Small Space Food Systems
 6-8 p.m.
Small-Scale Agriculture Demonstration Area
No Registration Fee

With proper planning and management, you can produce a significant amount of food in a backyard setting. Join us at the Noble Research Institute Small-Scale Agriculture Demonstration Area for our second annual backyard farming educational event. Learn and explore several new exhibits including novel raised-bed and container designs.

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UPCOMING EVENTS

For more information or to register, visit www.noble.org/events or call 580-223-5810. Preregistration is requested. For other agricultural questions, please call our Ag Helpline at 580-224-6500.



So You Want to Grow Series

Pecans | Sept. 4
Vegetables | Sept. 11
Fruits | Sept. 18

This series will cover various practices of site preparation, irrigation and variety selection for specialty crop production of pecans, vegetables and fruit.

6:30-8 p.m.
Noble Research Institute
Kruse Auditorium
No Registration Fee



JULY | 24

Systems Approach to Pasture Management Workshop
 8 a.m.-noon
Pasture Demonstration Farm
No Registration Fee



AUGUST | 2

Growing Season Prescribed Burn Field Day
 8:30 a.m.-3:30 p.m.
Coffey Ranch
\$25, Includes Lunch



AUGUST | 27

So You Want to Raise Cattle
 4-8 p.m.
Kruse Auditorium
\$25, Includes Dinner



SEPTEMBER | 4

So You Want to Grow Series: Pecans
 6:30-8 p.m.
Kruse Auditorium
No Registration Fee