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Figure 1: A spring-plus-autumn application of glyphosate to prevent seed production in the spring and to control emerged winter annual weeds in the autumn at the time of sowing resulted in greater establishment of cool-season perennial grasses.

Cool-season perennial grasses have potential to improve seasonal forage distribution in the Great Plains as a complement or alternative to cool-season annual grasses. In addition to developing new, improved perennial cultivars for grazing, Noble Research Institute researchers also studied the best protocols for getting the new forages established in the face of competition from annual grassy weeds.

Currently, the majority of beef and dairy cattle producers in the Great Plains rely primarily on cool-season annual grasses for grazing during autumn to spring. In recent years, however, there is an increased interest from

livestock producers in shifting from annually sown cool-season forages to more permanent perennial cool-season grass systems to remedy several downsides to the annual grasses:

- Unpredictable precipitation in autumn often delays planting of annual grasses, resulting in a lack of high quality forage for grazing during winter to early spring.
- Producers are concerned with the production cost of annual forages.
- In the Southern Plains, planting of annual grasses requires land to be fallowed for prolonged periods. Consequently, precipitation and wind cause a substantial loss of top soil and nutrients.

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PERENNIAL GRASSES: ADVANTAGES AND CHALLENGES

Cool-season perennial grasses have forage potential in the southern regions and have lower production costs compared to cool-season annual grasses since they do not have to be reestablished each year. That being said, there are challenges to overcome for successful establishment of the perennial grasses.

Producers who consider planting cool-season perennial grasses will more than likely attempt to convert existing fields where they have traditionally grazed out wheat and/or have volunteer annual ryegrass. However, naturally reseeding annual grasses like ryegrass or rescuegrass can be more competitive than perennial grasses during establishment, which may result in complete stand failure of the sown perennial grasses. Currently there are no herbicides labeled for controlling annual grassy weeds in newly established perennial grasses, therefore cultural practices and management will play an important role in their establishment.

With the release of several perennial cool-season cultivars developed at Noble Research Institute during the last few years, researchers understood that reliable establishment methods must be developed to help producers be successful with these new and improved perennial forages. In order to develop such a protocol, we conducted several experiments near Vashti, Texas. The studies were designed to determine the optimal planting date and seeding method for establishing cool-season perennial grasses into pastures infested with annual grassy weeds controlled through either grazing or herbicide application.

ESTABLISHMENT STUDIES COMPARE WEED-CONTROL AND SEEDING METHODS

In Experiment I (no spring glyphosate application), the ryegrass pasture was continuously grazed through May, and no glyphosate was applied in the spring prior to perennial grass seeding in the autumn. In Experiment II, 1 pound of active ingredient per acre of glyphosate was applied in early May to control annual grasses and prevent seed production. Seedbed preparation for both experiments included conventional tillage with an offset disk in late summer (August), followed by a drag harrow and roller packer to ensure a level and firm seedbed. The September planting date was seeded to dry soil, while the October and November planting dates were seeded seven days after autumn precipitation occurred to germinate weeds, which were then sprayed with glyphosate at 0.75 pound of active ingredient per acre within two days of planting. In Experiment I, this treatment resulted in a single autumn application of glyphosate; in Experiment II, this resulted in a sequential spring-plus-autumn application of glyphosate to prevent weed-seed production in the spring and to control emerged weeds in the autumn.

Establishment of cool-season perennial grasses was very poor in Experiment I (no



Figure 2: Establishment of cool-season perennial grasses was very poor when no glyphosate was applied in the spring prior to sowing in the fall.

spring glyphosate application) (Figure 2), while establishment in Experiment II (spring glyphosate application) (Figure 1) was good to excellent, even though precipitation was below the long-term average in both years. Planting in October followed by an autumn application of glyphosate after weed emergence but before grass seedling emergence resulted in greater establishment and higher subsequent dry matter production. Drilling seed also resulted in greater establishment and production than broadcasting.

SEEDING AND HERBICIDE RECOMMENDATIONS

Based on this data, it is recommended that producers:

- Control annual weeds in spring prior to planting.
- Drill seed in autumn (late September to October) following declining temperatures and adequate rainfall to germinate weeds.
- Apply glyphosate to control emerged weeds.

This will provide the best chance for these cool-season perennial grasses to establish in fields known to have annual grassy-weeds.

Alternatively, cool-season annual grasses can be effectively controlled using Clearfield

wheat technology the season prior to establishing cool-season perennials. Clearfield wheat is a non-GMO cultivar that is tolerant to the imidazolinone herbicides (such as Imazamox). It's important to select a two-gene cultivar, which indicates the Clearfield wheat cultivar has two genes that confer resistance to the herbicide. This will allow the wheat to withstand having a methylated seed oil added to the herbicide, which can greatly improve the herbicide efficacy on winter annual grassy weeds such as rescuegrass. Seed of the cool-season perennial forage can then be no-tilled into the wheat stubble the following fall.

In summary, if you are considering sowing an improved cool-season perennial grass, plan ahead to control winter annual weeds prior to and at planting time, and use a drill rather than a broadcast-and-roll system. Of course, you also will need to:

- Test soil for proper fertility.
- Plant when soil moisture is expected.
- Plant late enough to avoid high soil temperatures, but early enough for seedlings to reach at least the five-leaf stage before the first hard freeze.

If you can meet all these requirements, you have an excellent opportunity to have a quality, cool-season forage source for many years to come. 🐄



LIVESTOCK

Consistency Is Key in Trace Mineral Supplementation for Grazing Cattle

by Caitlin Hebbert, livestock consultant | cshebbert@noble.org



Trace mineral supplementation is easily one of the most confusing, misunderstood and controversial practices across the beef industry. We know that minerals are not

only important, but necessary for daily function and optimal performance. This is generally accepted and understood through both research and anecdote.

The benefits of minerals are particularly apparent in situations where diets are intentionally formulated for confinement, such as in feedlots and dairies. In those cases where we are feeding cattle every bite they get, consumption of nutrients is known, not

just estimated.

What is more difficult is to discern mineral consumption or deficiencies in grazing cattle. Diet selection in the pasture is largely anyone's guess, especially in a diverse system; so is the consumption of free-choice supplements like minerals.

ARE YOUR COWS MAULING THE MINERAL TUB?

I often hear that some producers don't consistently keep mineral available, because when they do, their cattle almost inhale it, consumption is more than five times what it should be, and it's not worth the cost. If your cattle are mauling the mineral tub, you might have blamed poor mineral formulation, bemoaned the price, or cursed your cattle for not knowing what's good for them, or all of the above. However, in

most cases, this feeding behavior can be attributed to delivery management of the supplement rather than to a poor formula.

You may have heard that it is important to just keep mineral available — whether cattle are really consuming it at the time or not. While cattle should be consuming mineral on some level year-round, there are certain times of year when they “fall off,” or consume far less than normal. These times often coincide with the start of fortified winter feeding and with naturally occurring fluctuations in mineral availability of forages throughout the year.

These changes in consumption are normal and are representative of the mineral concentration in the diet and of changing animal requirements. But

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when mineral is not consistently available, consumption becomes unpredictable and extreme. These dramatic swings are not beneficial to the animal or your wallet and can be better understood with simple psychology.

Let's say you either haven't had a mineral program in the past or you just got a new set of cattle. You put them out on mineral; they maul the tub and slick it. In this case, it's not likely that everybody got to get in a lick or two or 12. Maybe you don't get back around to putting out more mineral for four or five days, or longer. When you do replenish mineral supply, the cattle that missed out last time are going to be aggressive and will hoard the tub to try and get mineral while they can before it's all gone again, knowing that it will be some time before they get any more.

PSYCHOLOGICAL VERSUS NUTRITIONAL-FEEDBACK BEHAVIOR

At this point, your cattle are taking mineral in by the mouthful due to competition and desperation rather than simply to meet requirements. This behavior will continue if there is never a consistent and reliable supply. It's a psychological behavior rather than a nutritional-feedback behavior. Cattle in the feedyard act the same way if there are dramatic swings in the volume of delivered feed, resulting in bunk aggression and increased competition. They are simply anticipating limited availability and getting the nutrition while they can. In these cases, efficiency of nutrients wanes, nutritional status declines and frustration grows.

WHEN IN DOUBT, KEEP THE MINERAL OUT

Contrary to popular belief, if you can keep mineral out consistently through this period of competitive panic, your cattle will learn that mineral is always available and not a resource that will be depleted. There is the option of cutting your mineral with salt to help limit intake, which I only recommend doing for a limited period of time. These minerals have been formulated specifically and shouldn't need further modification in most cases.

If you do limit mineral with salt, do it to reduce this initial hoarding behavior, then reduce the salt content over time while being sure to keep mineral available. Within a relatively short period of time, you should be able to have mineral always available without salt addition and have normal consumption. It is valuable to you as a producer to have cattle with proper mineral nutrition. It is also good to know when they are under- or over-consuming, but you'll never know if you don't get them regulated with consistent delivery management.

Don't let your mineral tubs get slick. Check them consistently and often, and fill them when they are low. If you'd like more help regulating consumption or understanding the benefits of trace mineral supplementation, contact a beef cattle nutritionist or consultant. 🐄

EDUCATION

Learn About Managing Your Ranch for Success at TSCRA

by Amy Hays, adult education manager | aeahays@noble.org



If you are attending the Texas and Southwestern Cattle Raisers Association (TSCRA) annual convention in Fort Worth, we hope that you will make plans to visit with us. This year, we will have a booth on the trade show floor and

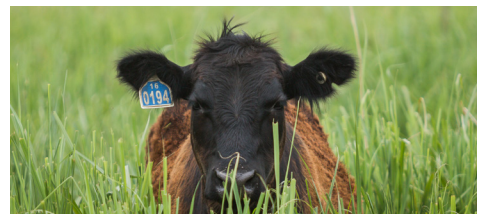
will be in the classrooms at the School for Successful Ranching (<http://cattleraisersconvention.com/school/>). We would love to connect with you and find ways that we can work with you on your journey to successful ranching.

TRADE SHOW FLOOR - BOOTH #739

Stop by for a visit and pick up information on management practices for your beef cattle enterprises. Visit with agricultural consultants and find answers to questions you have about your operations. We will also help you sign up or complete your profile for your Noble account. By signing up for a Noble account, you have access to educational events, newsletters and special programs that are geared toward land stewardship in grazing animal production for producer profitability.

SCHOOL FOR SUCCESSFUL RANCHING SPECIAL SESSION: ARE YOU AN INTENTIONAL PRODUCER?

Noble Research Institute's intentional producer education series is designed to guide producers who are looking to assess, measure and implement specific change in seven areas of production operations. This special track session is designed to help producers in two of the seven areas: livestock management and livestock marketing. The intent of this special track is to have producers assess their current operations, to highlight useful tools that can be used to monitor and manage parts of their operations, and to identify proactive management areas where they can begin to plan intentional management strategies. By the end of this session, producers should be able to target their plans in livestock and pasture management and to identify potential needs or plans for livestock marketing.



CATTLE RAISERS CONVENTION & EXPO

Fort Worth Convention Center
March 27-29, 2020
To register, go to www.cattleraisersconvention.com

INTENTIONALLY MANAGING YOUR LIVESTOCK

All livestock producers have livestock, but do you have managed livestock? There are key elements that you can create for strategies to maximize your management of your livestock.

In this session, we will focus on the critical areas of proactive management and provide useful tools to help you develop intentional management strategies — strategies that can move your operation from only operating to operating with a plan. You'll be able to assess where you are at currently and what your options are for moving forward. We will be sharing proactive management measures, grazing systems, and tools and metrics to monitor your goals.

INTENTIONALLY MARKETING YOUR LIVESTOCK

Do you sell your livestock or do you market them? An intentional producer has a plan for marketing. Marketing isn't just the selling, it is the business of building your livestock for a targeted endpoint. That endpoint can vary, but it isn't the place you end up at, it's the place you drive toward. It's traditional in the industry that we have the general idea that we want to market our livestock, but how does knowing your market determine everything from how you select your grazing regime and pasture management to your calving management program and even human resource management?

In this session, you'll assess your marketing strategy and where you can make intentional management decisions to build upon your livestock goals. 🐄



LIVESTOCK

Top 6 Factors Affecting Bull Fertility

by Ryon Walker, Ph.D., livestock consultant | rswalker@noble.org



Significant emphasis has been placed on the importance of fertility in the female, whether in the cow or a developing heifer. When we address fertility in one female, we are affecting one offspring.

When we address fertility in one male, we could be affecting up to approximately 35 offspring, in a single year. Is this oversight on bull fertility because bulls are overlooked until it is time to turn them out for the breeding season? We know that reproductive failures can occur in any cow-calf operation and can be costly. Let's take the bull out of that negative equation and take a look at the top 6 factors I believe affect bull fertility.

DISEASE

1 A good herd health program is invaluable, especially for the bulls. A health program in bulls reduces or eliminates the risk of transmitting diseases that can cause reproductive failure in females at different stages of pregnancy. Conditions such as Leptospirosis, Vibriosis, Trichomoniasis, Bovine Viral Diarrhea (BVD), IBR-Infectious Bovine Rhinotracheitis (Red Nose), and internal parasites can all contribute directly or indirectly to reproductive failure in the female. Diseases such as Lepto and Vibrio (bacterial diseases) and Trich (protozoal disease) cause abortion within the first 3 months (Lepto and Trich) or during mid-gestation (Vibrio) after infection and is transmitted directly between animals. These diseases can be vaccinated and managed for.

PHYSICAL CHARACTERISTICS

2 You can identify subfertile bulls with the help of a breeding soundness exam (BSE). A BSE consists of a scrotal circumference measurement (indicator of puberty and serving capacity), physical evaluation (indicator of mating ability) and a semen exam (assessment of motility and morphology). A BSE should be conducted at 30 to 60 days prior to the first day of the breeding season to allow time for a re-test of a bull that was questionable in passing (classification deferred) or a replacement if he does not pass a BSE (unsatisfactory breeder). A study conducted at Kansas State University reported that pregnancy rates were reduced more than 6% in cows serviced by bulls without a BSE conducted compared to bulls that passed a BSE prior to the breeding season. It is reported that 1 out of 5 bulls are subfertile across a random population, therefore a BSE conducted by your veterinarian is a cheap investment.

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NUTRITION

3 Nutrition can play a big role in the health of a bull prior to the breeding season. In young developing bulls, proper development is critical to ensure the bull is ready for the breeding season and producing high quality sperm. Under-development of bulls can delay puberty and potentially impair semen quality. Over-development of bulls with a high energy ration can create problems, such as excessive fat in the scrotum (increased heat stress), decrease semen production and quality, and risk of digestive issues and lameness. Bulls (young or mature) should go into the breeding season in a body condition score of 6 ± 0.5 (no skeletal structure or ribs visible with signs of some fat cover). Bulls should go into the breeding season wearing their Sunday best and come out wearing working clothes and should be evaluated at the end of each breeding season for soundness and body condition.

BULL-TO-COW RATIO

4 Improper bull-to-cow ratio in a breeding pasture can result in lower pregnancy rates or too much bull power during the breeding season. Multiple factors can affect the success of proper bull-to-cow-ratios, such as terrain, time of year, the desire of a bull to mate (libido), mating ability, semen quality, condition of the bull going into the breeding season, and bull age. Because of these factors, a range is generally used based on each producer's breeding program. I am comfortable with ranges from 1 bull to 10 cows up to 1 bull to 40 cows. Mature bulls (4 years of age and older) can service 30 to 40 cows comfortably as long as all of the other factors are favorable. However, younger bulls have a lower serving capacity, thus cannot service the same number of cows. A good rule of thumb to use on younger bulls is 1 bull to his age in months. For example, a 17-month-old bull should only be expected to service at most 17 cows during his first breeding season. There is a misconception that cows synchronized for natural service will need a lower bull-to-cow ratio because of the increased number of cows in heat during a shorter window at the beginning of the breeding season, compared to unsynchronized cows. Based on research in 2008, the bull-to-cow ratio can be the same as unsynchronized cows up to 30 cows.



INATTENTION TO BULL BEHAVIOR

5 Not paying attention to bull behavior during the breeding season can sometimes result in a fertility train wreck, especially in single sire pastures. Problems with the bull during the breeding season are oftentimes not detected until after the breeding season or pregnancy diagnosis at weaning, and by then it's too late. Observations leading to diagnosis of problems affecting fertility include lameness or illness. These problems negatively impact a bull's mating ability; cause physical or internal damage to the testes, which could negatively impact semen quality and serving capacity (the ability to service several cows in a short period of time); and affect how aggressive bulls are at servicing cows (libido). Libido is a measurable trait that is positively correlated to pregnancy rate and can be observed when multiple cows are in heat at the same time. We should spend more time monitoring and observing our bulls for physical and behavioral issues throughout the breeding season and make sure he is getting the job done.

HEAT STRESS

6 Exposure of bulls to increased ambient temperatures with insufficient heat loss (or evaporative cooling) can potentially reduce fertility due to heat stress. Testicular temperature of bulls must consistently be 2 to 6 degrees Celsius (3.6 to 10.8 degrees Fahrenheit) cooler than the body temperature, and relative humidity can affect a bull's ability to effectively dissipate heat through the skin when exposed to increased ambient temperatures. If heat stress has occurred eight weeks prior to the time bulls are exposed with cows, semen quality and motility can be reduced. Other factors such as breed type, access to shade and water, and improper handling can affect the ability of a bull to not dissipate heat effectively. Eight weeks are needed for normal semen production to return after exposure to heat stress.

FINAL THOUGHTS

In summary, management can have the biggest impact on reducing bull fertility issues. Keep in mind that it takes 60 days for a bull to produce sperm, so decisions should be made in advance to avoid potential negative effects on bull fertility. 🐮



YOUTH EDUCATION

Noble Invests in Teachers With Case Institute Workshop

Summer Workshop Will Teach Animal And Plant Biotech Skills



by Jenn Scott, youth education associate | jmscott@noble.org and Frank Hardin, Ph.D., youth education manager | cfhardin@noble.org

Every other year, Noble Research Institute's youth education program hosts a Curriculum for Agricultural Science Education (CASE) Institute workshop for teachers. This summer, the program is set to host the CASE Animal and Plant Biotechnology Institute in partnership with Oklahoma State University, Southern Tech and Oklahoma CareerTech. High school agriculture teachers who attend this institute will be certified to provide students with experiences in industry-appropriate applications of biotechnology related to plant and animal agriculture.

So, how does Noble's involvement in this workshop for teachers impact producers? The answer is simple. It helps cultivate the next generation of producers and consumers by

enabling agricultural teachers to provide some of the best, hands-on, agricultural and STEM-based (science, technology, engineering and math) curriculum for today's students.

Today, fewer and fewer students are exposed to agriculture, and there is a deficit of skilled workers in the profession. Even students who may be from a farm may not realize the great opportunities for a variety of careers in the industry. Therefore, it is important to provide exciting and engaging classroom experiences that capture students' attention and interest while conveying the importance of — and fostering an appreciation for — career opportunities in agriculture.

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The CASE Institute does just this. It offers rigorous and relevant STEM-based agricultural curriculum and training to teachers so they may use it in their classrooms. CASE has designed its courses to follow several pathways so they can fit into current agricultural program structures. Every CASE course promotes core concepts that every student should know in each agricultural subject area, taught in conjunction with science, math and technology concepts. The curriculum is designed to spiral students through the material, where each lesson builds on prior ones to form a complete understanding of the subject.

CASE is more than just a curriculum, however. It also serves as an instructional support system for teachers that includes hands-on training from experienced classroom teachers, a peer support system, and tools and resources to aid in student achievement.

Teachers who attend the institute at Noble this summer will be certified to provide students with experiences in industry-appropriate applications of biotechnology related to plant and animal agriculture. As biotechnology and its products (e.g. RR alfalfa) become more and more prevalent in agriculture, the next generation of producers and consumers may find themselves using and coming in contact with them more often. Educating these students about this science in agriculture will enable them to make informed decisions as potential producers in the future.

Even if these students don't go on to be producers, exposure to curriculum like this may produce the next-generation plant or animal scientist who aspires to solve great challenges in agriculture, policymakers who advocate for agriculture and the science behind it, educators who promote agriculture in their classroom, or informed consumers who appreciate the incredible families who grow our food, clothing and shelter.

So, does our hosting a CASE Institute this summer directly impact you today? Perhaps not. But in the future, it could mean more-engaging agriculture classes for your children, better-educated candidates to work in your operation or new discoveries by the next generation of agricultural research scientists. 🐮



RANGE

How to Reduce Your Risk When Improving Rangeland

Jeff Goodwin, conservation stewardship lead and senior pasture and range consultant | djgoodwin@noble.org

MANAGING INVASIVE WOODY BRUSH SPECIES IN THE GREAT PLAINS IS CRITICAL TO MEETING RANGELAND PRODUCTIVITY AND HABITAT GOALS.



As we move into the new year, spring is around the corner and with it comes a bevy of activity. Evaluating rangeland condition and developing improvement plans prior to the coming growing season is a common practice among progressive managers. Ideally, managers will appraise their current position, evaluate historic trends, develop targets, prescribe a practice (such as rangeland planting and brush management) and plan an implementation strategy, all the while being cognizant of the relative ecologic and economic risks. All too often, these risks drive the decision to implement the practice or not. Understanding key management points to mitigate these risks can aid in decision-making and ultimately increase the amount of rangeland improvement practices implemented successfully across the landscape.

Managing invasive woody brush species in the Great Plains is critical to meeting rangeland productivity and

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habitat goals. Brush management can be either an initial treatment or a maintenance/follow-up practice. The two most commonly implemented techniques are mechanical and chemical applications. Both treatments have their own pros and cons; ultimately, the decision to use mechanical or chemical brush management comes down to evaluating the target species, stand density, application costs, follow-up practices, and a host of other factors.

Rangeland planting is often a practice initiated to follow mechanical brush management depending on the level of soil disturbance and presence of existing seed sources. Although this is a common practice following a brush management treatment, rangeland planting can be and is also commonly implemented as a standalone practice to restore croplands to perennial grassland or to revitalize degraded rangeland. Any and all of these scenarios can have their own unique pitfalls and associated risks. Below are a few key management points to consider in an effort to mitigate the risks associated with brush management and rangeland planting.

BRUSH MANAGEMENT: MECHANICAL (APPLICATION PERIOD – ANYTIME)

KNOW YOUR SPECIES

With any mechanical brush management application, it is critically important to know your target species. The majority of the invasive brush species that we target in the Great Plains are “resprouters,” meaning if we remove the above-ground portions of the plant, it will resprout from the crown or the roots (typically into a multistemmed form that is increasingly difficult to control). Another consideration of warrant is the method of mechanical removal. If using an excavator or grubber to mechanically remove a resprouting

target species, it is important to remove the plant below the first lateral root. This will ensure that all of the underground buds have been removed. However, some species, such as eastern redcedar, do not resprout but can be effectively controlled by removing the above-ground growth.

Knowing your target species and its potential response will aid in designing an implementation strategy that will be effective.

KNOW YOUR TIMING

The timing of the mechanical brush management application has less to do with the type of treatment and more to do with its effectiveness. Although mechanical brush management can be done at any time, soil moisture conditions should be considered. When excavating brush species below the soil surface and its first lateral root, ensure that adequate soil moisture is available. In periods of reduced soil moisture, plants commonly shear off above the first lateral root allowing them the opportunity to resprout.

KNOW YOUR CONTEXT

Understanding the ranch’s soils and ecological sites can provide keen insight into the potential return on investment of management activities. Some ecological sites on the ranch may be limited in productivity potential due to slope or soil depth. They may also limit mechanical options due to surface rocks. Ultimately, these sites will not provide an adequate ecologic return on investment in the form of meaningful forage response, much less an economic return. Consideration should be made to leave these areas out, apply prescribed fire and sculpt the brush for wildlife habitat. Knowing when and where to apply these treatments within your own context can save money before it’s spent.

**IF USING AN
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BRUSH MANAGEMENT: CHEMICAL (APPLICATION PERIOD — DEPENDENT ON TARGET SPECIES)

KNOW YOUR SPECIES

Knowing the target species is particularly significant with chemical brush management applications. Each species has a potential efficacy to a particular chemical application, both to the chemical and application technique. Depending on the species, a particular application can have 100% control, no effect at all or more commonly somewhere in between. Knowing the species and ultimately the most effective application technique to treat it, can save time and money.

KNOW YOUR TIMING

The timing of a chemical treatment is very important. Typically, it is the physiological stage of the plant and the intended application technique that determines the timing. For chemical applications that are foliar, meaning the herbicide is sprayed on the leaves of the plant, the physiological stage of growth is critical to ensure the herbicide can be translocated to the roots. This desired plant physiological stage drives the timing window for application and generally provides a smaller timing window for foliar applications. In contrast if using a basal bark or stem spray, the physiological stage of the plant is less important and the timing windows are much less restrictive. Regardless, consult the herbicide label regarding timing recommendations and restrictions.

KNOW YOUR RATE

When using any chemical application, knowing the effective rate of application is critical to not only its success but to reduce the risk of over- or under-application. Over-application may not only increase costs but it can potentially have a negative impact on the desired plants and be against regulations. More is not always better with chemical brush applications. All chemical applications should be applied based on the product's published label. Other helpful suggestions can be found in state extension publications like Texas A&M AgriLife Extension's ERM-1466: Chemical Weed and Brush Control Suggestions for Rangeland. This publication provides chemical options that have been further tested for efficacy and rated by application method. Read more online at <https://www.agrilifebookstore.org/Chemical-Weed-and-Brush-Control-p/erm-1466.htm>.

RANGELAND PLANTING (APPLICATION PERIOD — DECEMBER TO APRIL)

ASSESS THE SITE CONDITION

Understanding the current site conditions can aid in the success of the planting. Following



KNOWING THE SPECIES AND ULTIMATELY THE MOST EFFECTIVE APPLICATION TECHNIQUE TO TREAT IT, CAN SAVE TIME AND MONEY.

mechanical brush management specifically, determine the extent of soil disturbance. If the disturbance is excessive, first evaluate if the site has the ability to regenerate on its own from an existing seed bank or if a seed source is in close proximity. Often, pastures are reseeded following brush management when an existing seed bank is available. In these cases, proper grazing management and time will allow the pastures to recover at a much reduced cost. However if reseeding is warranted, the condition of the soil prior to planting can influence species selection decisions. This is generally more of a concern on cropland conversions, where the soil has been tilled for successive years. In these situations, consideration should be made to select species in the right proportions that will be initially successful in a degraded soil. The remaining proportion of the mix can be high seral desirable species.

GROW THE BIOLOGY

Many of the sites that are reseeded across the Great Plains are in a degraded condition and have reduced biological activity. We are typically told to plant what we want growing in the field, generally high-seral, climax prairie grasses like big bluestem, indiagrass, switchgrass, etc. However, most of these high-seral prairie grasses are highly dependent on the health of the soil biology. Specifically, these species need the opportunity to develop associations with mycorrhizal fungi. If those soils have been tilled for the past 100 years, the likelihood of that opportunity is low. In an effort to speed up this process, consider efforts to increase the biological activity of the soil. This can be accomplished by planting a

multispecies cover crop on the site for a couple of seasons then planting the desired mixture or by increasing the proportion of early/mid-seral plants in the initial seeding mixture.

GIVE THE SEED A CHANCE

There are multiple planting techniques that can be successful on rangeland plantings, from seed drills to broadcast planters. However, they all need to ensure that the seed makes solid contact with the soil. With no-till drills, this is less of a concern; however seed contact is critical with broadcast operations where the seed is broadcast on top of the soil. This concern can be alleviated by ensuring a firm, weed-free seed bed is prepared prior to planting and by rolling the site with a cultipacker following the seeding operation. The other consideration for native plantings is seeding depth. Often native seeds are planted too deep. Native plantings should be seeded on the soil surface and packed or planted no deeper than 1/4 inch.

DON'T FORGET PATIENCE AND PROPER PLANNING

In due course, reducing the risks associated with rangeland improvements can increase the manager's confidence in making the investment and increase the likelihood of success. Patience and proper planning play key roles in all rangeland improvements. Given fluctuations in markets and less than predictable weather, all of which are out of the control of the manager, consideration should be focused on areas where we have control in order to greatly mitigate the risks to rangeland improvements. 🐄

NOBLE NEWS & VIEWS

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FEB. 25

Managing Crops in Hoop Houses

6:30-8:30 p.m.
Kruse Auditorium, Entry 5
No Registration Fee

Specialty crop growers worldwide continue to adopt high tunnel hoop houses because they provide an element of environmental control not possible with field production. During this course, you will learn how to manage the growing environment unique to hoop houses to produce high yielding, high quality crops.

MARCH 26

Managing Weeds and Insects in Your Pastures

1:30-5 p.m.
Kruse Auditorium, Entry 5
No Registration Fee

Pasture and hayfield managers face many challenges from factors over which they have no control. They do, however, have some measure of control over weeds and insects. There are many different approaches to pest management, and each producer must select the approach, or combination of approaches, that best align with his or her own philosophy.

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UPCOMING EVENTS

Preregistration is requested. Registration fees for paid events will increase by \$10 one week before the event. For more information or to register, visit www.noble.org/events. For other agricultural questions, please call our Ag Helpline at 580-224-6500.



MANAGING EASTERN BLUEBIRDS

APRIL | 7

Come learn about eastern bluebirds, and other cavity-nesting songbirds, and how to build, place and manage their nest boxes. You will build a nest box that you can take home. You should also have the opportunity to view actual bluebird nesting activity in nest boxes.

4:30-7:30 p.m.
Protected Ag Demo Area, Entry 2
Registration Fee: \$25



Selecting and Developing Bulls
9 a.m.-3:30 p.m.
Oswalt Ranch
Registration Fee: \$25



Beef Quality Assurance Certification
1:30-5 p.m.
Kruse Auditorium, Entry 5
No Registration Fee



Richard Mifflin Kleberg, Jr. Lectureship on Grazing Management
8 a.m. Pavilion
Registration Fee: \$500



Hedging to Increase Pecan Production
1-4:30 p.m.
Montz Pecan Orchard
Wichita Falls, TX
No Registration Fee