I’ve had more calls on sandbur control in pastures and hayfields in 2014 than I can ever remember. While it is obviously too late to do anything about them this year, plans can be made for next year. In general, if you had sandbur in a field this year and were unable to control them, there is a good probability they will be back next year.

There are four products that I recommend for sandbur control in pastures and hayfields. For me to recommend a product, it has to meet a few basic qualifications. First, it must be labeled for the crop it is applied to. It is illegal to apply a pesticide to a crop that is not listed on the label. Second, it has to work. In this instance, it has to control a large percentage of the sandbur when correctly applied. Third, it cannot cause undue crop injury when used according to labeled directions.

There are two broad ways to control sandbur. One is with a preemergent herbicide. This type of herbicide must be applied before the sandbur seed germinate. The only labeled preemergent herbicide for sandbur control in pastures and hayfields is Prowl® H₂O. It is labeled for bermudagrass and other warm-season grasses when in winter dormancy. In southern Oklahoma and northern Texas, the most common application time is February or very early March before the grasses break dormancy. There is a 60-day haying restriction and a 45-day grazing restriction if Prowl® H₂O is used. Good results can be obtained from Prowl® H₂O if it is properly incorporated by rainfall or irrigation within 10 to 14 days of application. It is a fairly expensive treatment.

The other three products for sandbur control in pastures and hayfields are post-emergent treatments. This means the products must be sprayed onto an emerged sandbur plant. One product is Pastora®. It is only labeled for bermudagrass, so applying it on any other type pasture or hayfield is illegal. It must be applied to very small sandbur, and the spray must contact the sandbur plant. For that reason, the bermudagrass should be grazed or hayed very short. If the bermudagrass is taller than the sandbur plants, it will absorb most of the herbicide and poor control may result. The labeled rate is 1.0 to 1.5 ounces per acre. It costs about $20.
is labeled for use in most perennial grass species, including native range. It may damage fescue if applied to that crop. It is an excellent herbicide, with both preemergent and post-emergent activity. I recommend its use in cases where forage growth is less important than controlling sandbur. It is relatively inexpensive and has a wide weed control spectrum. There are no grazing restrictions and a seven-day haying restriction when using imazapic.

In many cases, a producer may treat sandbur in the spring and get excellent control, only to see a new flush of sandbur appear in late summer if good rainfall occurs. Keep in mind that this is not due to control failure, but due to the fact that there is a large supply of seed in the soil that germinate when conditions are good. Do not expect to eradicate sandbur with one application or in a single year.

The least expensive treatment is Roundup PowerMax® applied immediately after the first hay cutting. It is labeled for use at a rate of 10 ounces per acre on bermudagrass hayfields immediately after the first hay cutting. It will also control many annual grasses other than sandbur. It is important to treat as soon as possible after the first hay cutting for two reasons. First, there will be less crop injury since there will be less bermudagrass leaf area to take up the herbicide. Second, the product must contact the sandbur plants while they are small; this is less likely to happen if the bermudagrass has regrown and is covering the sandbur. There are two things to keep in mind with this product. One is that there is a 28-day hay and grazing restriction after using it in the manner described above. Two is that you can only make one Roundup® application per year to a bermudagrass field. If you used Roundup® in the winter or early spring for winter weed control, it cannot be used after the first hay cutting. Roundup PowerMax® is the least costly treatment available for sandbur control.

The fourth product is one that I recommend with caution. It is imazapic, sold under the trade names Plateau® and Panoramic 2SL. The caution is this product will stunt bermudagrass growth for a period of at least 30 days. Some varieties, such as Jiggs and World Feeder, are more prone to crop injury than others. It is labeled for use in most perennial grass species, including native range. It may damage fescue if applied to that crop. It is an excellent herbicide, with both preemergent and post-emergent activity. I recommend its use in cases where forage growth is less important than controlling sandbur. It is relatively inexpensive and has a wide weed control spectrum. There are no grazing restrictions and a seven-day haying restriction when using imazapic.

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Many cattle seminars across the Southern Great Plains have offered sound advice about replacement female development and selection. A significant number of producers are strongly considering, if not already in the process of, rebuilding their cow herds. Buying or raising replacements is an opportunity to improve the quality of your herd and product. A few common principles have emerged that I believe are very important to keep in mind when you are ready to rebuild.

Generally, the ideal cow for an operation is one that produces at her maximum genetic potential in the environment you are willing and able to provide. Besides things like climate, forage type, terrain, pasture size, distance to water, etc., “environment” is also the knowledge, experience and management that I bring to the operation. Her reproductive performance (bringing a calf to the weaning pen every 365 days) is the most direct measure of how well she fits my environment and the factor that has the most impact on profitability.

1. Select replacements that will be moderate in mature size and with average milk production. Reproductive performance is primarily driven by proper nutrition, and nutrition requirements are highly dependent on size and genetic capacity to milk. For instance, while nursing a calf, a 1,300-pound cow needs over 10 percent more total dry matter intake, protein and energy than a 1,100-pound cow. After weaning, although both cows have lower nutrient requirements, that difference in their needs remains. Cows that fail to rebreed are often too big and/or produce too much milk for available resources and management to support. In my experience, cows weighing 1,000 to 1,300 pounds at maturity and that are average milk producers seem to fit the spectrum of environments in this area the best.

2. Select replacements that increase the uniformity of the herd in breed makeup, size and stage of reproduction. This will increase the uniformity of the calf crop, which numerous studies show adds significant value to your product at marketing. Data from Oklahoma indicates that a pen of six to 10 head of uniform calves can bring a premium of $7.50 per hundredweight compared to smaller, less uniform lots.

3. If purchasing pregnant replacements, buy only females that are bred to calve early in your calving season, or even a month or two before your calving starts. This sets the new females up for success, with the potential to stay in the early-calving part of your herd. It’s a common objective to have at least 65 percent of calves born in the first 21 days of the calving season. Logically, early-born calves will be heavier at weaning. In fact, you give up 50 pounds of weaning weight for each 21-day period into the season a calf is born. Of course, having at least 65 percent of your calves in a 21-day period increases uniformity and value at marketing.

4. Breed yearling heifers to calve a full month before the cow herd begins calving. This age-old recommendation is still valid. This gives them an extra month to be ready to breed along with the mature herd.

Be very deliberate when selecting replacements, so that you come out on the other side with a more uniform, productive herd that fits your environment.
In the early 1950s, the Noble Foundation established its forage breeding program, specifically developing improved cultivars for four small grains species: rye, wheat, oat and triticale (a rye/wheat hybrid). Through the generations, the program has developed historic new cultivars, such as Elbon, Oklon and Maton rye varieties, that have enhanced agricultural production. Today, the Noble Foundation’s small grains breeding program is the longest running breeding program in the Foundation’s history. This ongoing work has produced four new small grains cultivars over the past few years that have been released by the Noble Foundation and will be commercialized by Oklahoma Genetics Inc. Each of these continues the rich legacy of cultivar development started more than 60 years ago.

Wheat NF101

Virtually all wheat breeding focuses on grain yield and quality. The main goal of the Noble Foundation’s small grains breeding program is to develop dual-purpose cultivars with high fall and winter forage yield suitable for sustainable forage production in Oklahoma and northern Texas, and which also have better grain production. NF101 wheat is the first wheat cultivar developed at the Noble Foundation for these purposes. NF101 is an awned, hard red winter wheat that was released in 2014. During seven years of testing in southern Oklahoma, NF101 produced the greatest fall-winter forage yield when compared to Jagger or Endurance. Under rain-fed conditions, NF101 is an excellent choice for producers wanting to maximize their fall forage production. NF101 is well adapted to southern Oklahoma, northern Texas and also to the southeastern United States. Heading is similar to Jagger and three days earlier than Endurance with intermediate to moderately good straw strength.

Triticale NF201

Released in 2013, NF201 triticale is an alternative small grains forage for producers. Compared to wheat, triticale is more productive on marginal lands and requires less management under stressful conditions. NF201 has shown excellent fall and winter forage production, making this triticale the best choice for producers who need forage for early winter grazing. In seven years of testing in southern Oklahoma, the fall forage yields of NF201 were equal or superior to Thundercale and
**FORAGE**

**Oat NF402**
NF402 is a facultative winter-type forage oat that was released in 2013. It is intended for pasture and forage production, especially during the fall-winter period. In seven years of testing in southern Oklahoma, NF402 produced more total forage than most commonly grown oat cultivars, with nearly half of the production occurring during the fall and winter period. NF402 was selected and released based on superior forage production, especially in the fall and winter, when compared to standard oat cultivars like Dallas, Harrison and PlotSpike.

The early fall-winter forage production of this oat is particularly valuable, allowing producers better flexibility for earlier grazing or increased stockpiling. Its maturity, and morphological and agronomic attributes are similar to Dallas. NF402 is ideally adapted to the Southern Great Plains and adequately adapted throughout the southeastern United States. Forage nutritive value of NF402 is excellent with crude protein levels higher than that of Dallas and Harrison. In southern Oklahoma and northern Texas, NF402 has exhibited complete or partial senescence during winter but excellent recovery during spring. NF402 has demonstrated better freeze tolerance than many other cultivars developed for the southern United States.

The Noble Foundation forage breeding program continues its focus on creating dual-purpose cultivars with improved forage qualities – better fall production, the ability to recover after grazing and better overall forage yields to benefit livestock production in the Southern Great Plains and southeastern United States. For more information, contact the Noble Foundation for the brochure *Forages for the Southern Great Plains*. ■

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**Maton II Rye (NF306)**
Maton II (NF306) is a forage rye cultivar that was released in 2006. It is intended for use in fall through winter grazing systems. This variety builds upon the Noble Foundation’s previous release, Maton. Maton II (NF306) produces more total forage when compared to the commonly grown rye cultivars Elbon, Maton and Oklon in southern Oklahoma. More than half of its total yield is produced during the early growing season (November to February). Maton II (NF306) has early fall and winter forage production potential. Morphological and agronomic attributes are similar to Elbon and Maton, but Maton II tends to have slightly taller plants with bigger leaves and thicker stems. Maton II is especially suited to light-textured and sandy loam soils. Maton II (NF306) is well adapted to southern Oklahoma, northern and eastern Texas, and throughout the southeastern United States. Crude protein content of Maton II (NF306) forage is higher than that of Maton or Oklon. Winter hardiness and lodging resistance are similar to Maton in southern Oklahoma.

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Tamcale 5019. In eastern Texas, performance of NF201 was superior to check cultivars for early season yield. NF201 is best adapted to the areas of southern Oklahoma and northern Texas.

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Unfortunately, eroded areas are all too common. Erosion usually is a result of overuse of the area through poor tillage, off-road vehicle traffic, grazing or excessive herbicide application. Improperly using these practices over a prolonged period will significantly weaken or completely remove the necessary vegetation needed to protect the valuable topsoil from being washed away by water or blown away by wind. Once the topsoil is gone, it will take decades to hundreds, if not thousands, of years to replace it. Erosion typically starts small and increases over time. Here are a few strategies using natural materials, such as old hay and wood mulch, to reduce actively eroding gullies.

The gully in Figure 1 was present on the McMillan East Farm when the Noble Foundation began managing the property in 2008. We think the land above the gully was farmed in the past. This gully was approximately 20 feet wide at the widest point and 15 feet deep at the deepest. We used 20 to 25 old round bales to fill the gully as seen in Figure 2. Typically, many landowners fill gullies like this with tires, rocks, concrete or other hard materials. We chose to use round bales because they would serve as a temporary soil for vegetation to establish. The round bales also act as a sponge, soaking up water, as well as slowing and redirecting the water.

We also created a small diversion terrace made of mulch donated by a local tree trimming company. The mulch terrace helps protect the head cut (the ledge where water enters the gully). Reducing the amount and speed of water entering a gully is necessary to reduce future erosion. Properly implemented land use practices are the key to preventing erosion from starting. All this work was completed with a farm tractor with a front-end loader equipped with a bale spear and bucket.

The eroded area in Figure 3 was created by water running off the same field with the abovementioned gully. In this area, all the topsoil was completely eroded away leaving only subsoil, which is not conducive to plant establishment and growth. A gully had begun to form approximately 30 yards from the edge of the exposed subsoil. This gully was roughly 4 feet wide at the widest point and 3 feet deep at the deepest. Due to the smaller size of the area, we were able to fill the gully with soil from old brush piles. This soil replaced the missing topsoil and added existing vegetation. To protect this new soil and facilitate vegetation establishment, we created several mulch terraces to slow excess runoff and capture soil (Figure 4). The captured soil will help provide a place for vegetation establishment.
Lime cost affects the economics of nitrogen use

by Jon Biermacher / jtbiermacher@noble.org and Wade Brorsen / wade.brorsen@okstate.edu

If you are not getting the cool-season forage production that you expect, low pH is a likely culprit. Farmers in the Southern Great Plains typically apply significant quantities of ammonium-based nitrogen (N) on their cool-season cereal forages – forages that are commonly grazed by stocker cattle. This practice has been shown to acidify the soils over time. Lime is typically recommended and used to return the health of the soil back to the ideal pH range (6.0 to 6.5) for optimal production; however, applying lime to the soil is expensive. Recommendations about the optimal levels of N to apply to cereal forages typically ignore the cost of lime. In response to this issue, we conducted an economic study to determine the effect of considering the cost of lime on the current recommendations about the optimal level of N.

A long-term agronomic experiment conducted at the Noble Foundation’s Red River Farm near the community of Burneyville was used to establish the effect of liming, N fertilization rate and timing of application, and soil pH dynamics on mixtures of rye-ryegrass pasture. Mixtures of rye-ryegrass were planted each year in early fall at a seeding rate of 10 pounds per acre. Six treatment levels of N were applied as (1) a single application in the fall at the time of planting; (2) in the spring as a topdress; or (3) in split applications with half in the fall and the other half in the spring. Treatment rates were 0, 100, 150, 200, 300 and 400 pounds per acre per year. Effective calcium carbonate equivalent (ECCE) was applied to half of each plot (split plots) in the study in 1996, 1998 and 2004 to raise soil pH levels to 6.0 to 6.5. Lime rates ranged from 2,000 to 5,000 pounds per acre depending on the year and N treatment level. The split-plot application of lime provided the opportunity to measure forage yield for the six rates of N with and without lime.

Using data from this study, an equation representing the forage yield response to lime and nitrogen was estimated and used along with expected prices for forage, N in the form of urea (46-0-0), and lime in the form of 100% ECCE to evaluate the producer’s expected net return per acre for a typical stocker cattle graze-out enterprise in south-central Oklahoma. For a base-case market scenario, we used 45 cents per pound ($415 per ton) for the price of N and 1.5 cents per pound ($30 per ton) for the price (including application) of lime. The price of forage was determined as the cost of beef gain (dollars per pound) divided by the pounds of forage required by a typical stocker animal to produce a pound of gain. For a base-case cost of gain of 45 cents per pound, we assumed a price of forage equal to 4.5 cents per pound.

When considering the cost of lime, the economical optimal recommended level of N was reduced by about 20 pounds per acre (i.e., from 150 to 130 pounds per acre). The Noble Foundation recommends testing soils each year for nutrient content and pH level. As soil pH levels fall into acidic levels, we recommend applying lime to restore the productive health of the soil. Considering the economics of applying N every year and lime once every three to five years, producers would be better off to reduce their applications of N by about 10 to 15 percent from their normal optimal levels and use the saving each year for anticipated lime applications. Complete details of the economic study can be found in: Tumusiime, E., B.W. Brorsen, J. Mosali, and J.T. Biermacher. 2011. How Much Does Considering the Cost of Lime Affect the Recommended Level of Nitrogen? Agronomy Journal 103(2): 404-412.
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## EVENTS

### Managing Taxes for Agricultural Producers
- **Time:** 1:30 p.m.-4:30 p.m.  
- **Date:** Dec. 9, 2014  
- **Location:** Noble Foundation Kruse Auditorium  
- **No Registration Fee**

### Prescribed Burn Workshop
- **Time:** 9 a.m.-5 p.m.  
- **Date:** Jan. 14-15, 2015  
- **Location:** Noble Foundation Pavilion  
- **No Registration Fee**

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For more information or to register, please visit www.noble.org/agevents or call Maggie Scott at 580.224.6375. Preregistration is requested.