THE SAMUEL ROBERTS NOBLE FOUNDATION

AG News and Views

A monthly publication of the Noble Foundation's Agricultural Division

Volume 33 / Number 1 / January 2015

WILDLIFE

Hog sounder size should determine trap choice

by Mike Porter / mdporter@noble.org

Trapping probably is the most effective feral hog control technique available to most land managers. Aerial gunning can be fairly effective but should be implemented over large areas (a few thousand acres), requires a helicopter, and can be relatively dangerous considering the necessary low altitudes and slow speed. Ground hunting is fun but not particularly effective at reducing swine populations. No toxicants are legal but are being investigated.

Many different trap technologies are available: cage or box traps (Figure 1); circular spring panel traps – probably the least effective among the options discussed here – (see example at bit.ly/SpringTrapPhoto); corral traps (Figure 2) (bit.ly/Noble HogControl); drop nets (bit.ly/Noble DropNets); BoarBuster (bit.ly/BoarBusterArticle); and others.

Trap size should be matched to feral hog sounder size. A sounder is a herd of feral hogs primarily comprised of one or more adult sows and one or multiple generations of offspring. A sounder is the primary social unit among feral hogs. One or more mature boars will spend time with a sounder when trying to mate with a sow but then will move on searching for another sow.

Figure 1

Figure 2

Photo taken by Billy Higginbotham-Texas A&M AgriLife Extension Service

The goal when using a trap should be to capture an entire sounder at one time. Feral hogs are relatively intelligent and can learn quickly, so a portion of a sounder remaining outside a tripped trap often learns to avoid the trap. Cage or box traps can be effective management tools when

dealing with small sounders, e.g., less than six individuals or individual boars. Cage or box traps may capture many hogs over time when hogs are abundant but usually do not capture enough whole sounders to prevent population expansion and train many feral hogs to avoid traps. When dealing with sounders comprised of more than about six individuals, larger traps such as corral traps, drop nets or the BoarBuster are more appropriate.

In past years, corral traps and drop nets represented some of the best known tools for capturing feral hogs. However, ongoing research at the Noble Foundation led to the development of the BoarBuster trap. BoarBuster (available commercially in 2015) marries the technology of remote monitoring and triggering with the best aspects of previous trap designs. BoarBuster captures whole sounders with a single trapping. In testing, the trap captured as many as 39 feral hogs in a single drop.

Appropriate baiting and training protocols should be practiced to increase the likelihood of trapping a whole sounder. Use of infrared-triggered cameras is very helpful to learn sounder size and pattern feral hog activity. It is important to remove feral hogs from a trap as quickly as practical. Other sounders or individual feral hogs might travel by a trap containing hogs and learn to avoid it. Also, it is unethical to leave trapped animals in a trap very long because they might escape, injure themselves or others, or suffer due to weather exposure or anxiety. When a trap cannot be checked at least once a day, it should be shut, tied open or removed so it cannot capture animals, especially non-target animals. For more information, visit www.noble.org/ag/wildlife/feral-hogs. ■

Cold increases nutrient requirements

by Clay Wright / jcwright@noble.org

This article originally appeared in the Dec. 2007 Ag News and Views *newsletter.*

First, we have a tendency to balance winter rations for cows in two phases: non-lactating, in the middle third of pregnancy (dry); and then post-calving, in peak lactation (wet). Using nutritional requirements for the average weight of the cow herd, it's simple to come up with two feeding regimes; one for before calving and one for after calving. The fact is that in the last third of pregnancy, when the fetus makes 75 percent of its growth, a cow's nutritional requirements increase enough that we need to pay closer attention. During this period, protein and energy needs increase about 40 percent and 20 percent, respectively. For a 1,200-pound cow, that's 0.4 pounds of additional protein and 1.75 pounds of additional energy (TDN). As a result, the ration that maintains weight of a dry cow during the first two-thirds of pregnancy results in weight loss during the last third. If you begin calving in March, it's time to up the supplement.

Second, it's time to plan for inclement weather – the unusually cold, often wet and windy kind that comes through several times each winter. A cow's maintenance requirements are pretty stable down to 32 degrees F. That's her Lower Critical Temperature (LCT) in average body condition with a dry coat. That temperature is based on wind chill, not just ambient temperature. For each degree below 32 F, her energy requirements increase 1 percent. If her hair coat is wet, her LCT is 60 degrees F, and energy requirements go up **2 percent** for each degree below 60 F.

In cold, wet weather, it's possible for energy needs to increase 50 to 100 percent. Often, it's not safe or practical to feed that much more. One alternative is to increase energy intake at lower amounts before, during and immediately after a winter weather event. Allowing access to man-made or natural shelter also can help change the wind chill temperature in our favor. Our whole objective is to maintain body condition score of at least 5.0 prior to, during and after calving so that the herd will cycle and conceive on time for the next "go-around." ■

Grazing affects plant root growth

by Jim Johnson / jpjohnson@noble.org

Over the years

I have seen many grazing operations in many parts of the country. I have seen places that never seem to grow as much grass as they should, and I have seen places that always seem to have lots of grass. Likewise, I have seen places that have been hurt by the extreme weather of the past several years, and I have seen places that have tolerated the extreme weather quite well. The places that have lots of grass and are doing well don't necessarily have better soil or get more precipitation, and they may not be stocked lighter or rested more days per year. So what is the difference? Roots and the effects that management has on the roots.

I've always kind of known that grazing management affects roots, but it was made crystal clear to me this past summer when I was introduced to some work published by F.J. Crider in 1955. Through several experiments using various perennial grasses, he showed the effects that forage removal has on root growth.

In one experiment, Crider showed that when more than half of the forage is removed from a plant, root growth stops within the first day or two afterward and stays stopped from six to 18 days, with an average of 11 days. In the real world, this means if cattle have the opportunity to graze more than half of the top growth of a grass, at an interval less than 11 days, the roots never get to recover. If the roots don't recover, then eventually neither will the top.

In another experiment, Crider showed the effect that a single removal of top growth, in 10 percent increments, has on root growth. When 40 percent or less of the forage is removed, 0 percent of the roots stop growing. When 50 percent or more of the forage is removed, an increasing percentage of the roots stop growing. When 90 percent of the forage is removed, 100 percent of the roots stop growing (Table 1). In other words, leaving more than half of the forage any time a plant is grazed during the growing season allows the roots to continue to grow. If the roots keep growing, so should the forage.

Table 1

	% Root Growth Stoppage Three Days After Forage Removal			
% Forage Removal	Test 1	Test 2	Test 3	Test 4
90	100	100	100	100
80	100	100	91	81
70	78	97	77	76
60	50	80	54	36
50	2	8	38	13
40	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
0	0	0	0	0

This represents four tests with three different grass species. From Crider, 1955.
Note that somewhere between 40% and 50% of the forage can be removed without stopping root growth.

Not only did higher percentages of forage removed result in greater percentages of roots that stopped growing, the higher percentages of forage removed also resulted in greater lengths of time before the roots resumed growth. Thirty-three days after top growth removal, plants with 80 and 90 percent of their forage removed still had a portion of their roots that had not resumed growth.

In a companion experiment, Crider showed how repeated removal of forage affects root growth. Like the previous experiment, removal of a percentage of top growth, in 10 percent increments, was done. However, in this experiment, forage was repeatedly removed to the height of the initial removal three times per week for five weeks. This time, 33 days after initial top growth removal, plants where 50 percent or more of their forage was removed still had a portion of their roots that had not resumed growth, and none of the roots had resumed growth on the plants with 70 percent or more of their forage removed.

So removing half or more of the forage at a time stops root growth whether cattle graze rotationally or continuously. However, leaving half or more of the forage allows root growth to continue uninterrupted. If the roots grow more, the forage grows more; in the long run, more forage will come from the half that is grazed.

The entire article by Crider can be found by looking up *Root-Growth Stoppage Resulting From Defoliation of Grass* by Franklin J. Crider, Technical Bulletin No. 1102, United States Department of Agriculture, February 1955. ■

Carry capacity influences leased land value

by Dan Childs / mdchilds@noble.org

Profits from grain and livestock enterprises generally impact the rental rates on lands that are used to grow these commodities. During highly profitable times, rental rates for land usually trend higher. Likewise, when profits are lower, rental rates will trend lower. How quickly rental rates adjust depends to a certain degree on how fast profitability changes for the underlying commodity.

A good example of rental rates adjusting to profitability can be observed for corn. General profitability of growing corn during the period of 2008 to 2013 trended stronger. In the state of Illinois where corn is commonly grown, the University of Illinois reported[1] rental rates moved from an average of $152.72 per acre in 2008 to an average of $196.13 in 2013. This is an increase of about 28 percent.

Current projections are for the profitability of the cow-calf sector to set record highs for 2014. These record profits are also having an impact on rental rates for pastureland where cows are grazed.

Pastureland leased for grazing cows is commonly negotiated by the acre. Some consideration is given to the amount of open ground, type of base grass and condition of the stand. Another factor is the animal unit year (AUY) – the carrying capacity in terms of the number of cows that can be grazed on the property during the growing season or year-round without jeopardizing the integrity of the grass stand. Often, however, AUY capacity is neither estimated nor considered.

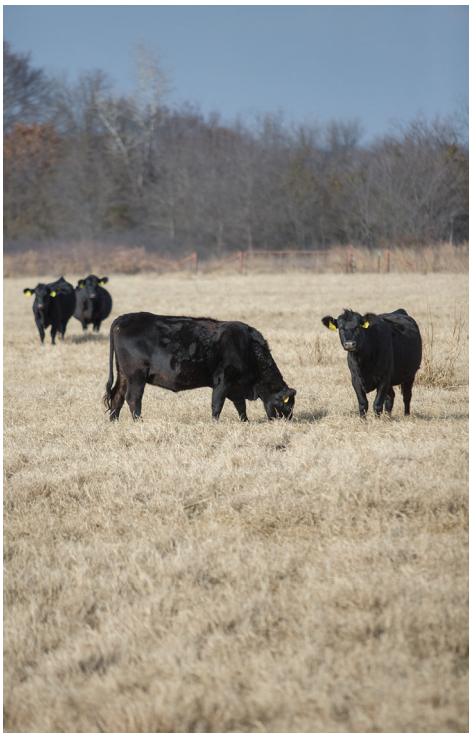
An AUY is more specifically defined as the amount of grass needed to sustain a 1,000-pound cow for 12 months and her calf for seven of those months. It is generally accepted that an animal unit will consume an average of 26 pounds of grass per day. Estimating the number of AUYs provides the amount of potential grass or "feed" the property is capable of producing. Knowing the carrying capacity of a property is helpful to the landowner by allowing them to know how much grass or feed they have for sale and, likewise, for the tenant to know what he or she is buying. Not many livestock owners purchase a sack of feed without knowing what it weighs or having an idea of the quality of feed in the sack.

Rental rates that are based on carrying capacity provide information both to the landowner and the tenant concerning the amount of feed being transacted. This knowledge should allow each party to make a more informed decision, which could lead to a more equitable and long-standing agreement between the two parties.

A variable in carrying capacity for land with improved forages, e.g., bermudagrass, love grass or old world bluestems, is fertilizer. Applying nitrogen fertilizer to these forages can increase carrying capacity considerably. The cost and application of the fertilizer is generally the responsibility of the tenant. Therefore, carrying capacity is normally calculated without any fertilizer added. However, because the potential is there for increased forage production, land with an improved forage base will generally rent for a higher amount than land with a native grass base.

Once carrying capacity is determined, a price can then be negotiated for the lease value of the property. As mentioned earlier, the lease value is often correlated to the general profitability of the cow-calf sector. An index can be used to capture or indicate profitability. An index used in some leases to stay current on profitability is the price per hundredweight of a 500-pound steer calf the first week of August. August is used because it is often the average price for the year. The price per hundredweight becomes the annual grass lease fee for the year per animal unit. For example, if a 500-pound steer calf was bringing $300 per hundredweight, then the annual lease per cow per year would be $300. This amount would not include care for the animals, only grass. ■

[1]www.farmdoc.illinois.edu/manage/cash_rent_Illinois.pdf



Artificial insemination increases profits

by Robert Wells / rswells@noble.org

Calf prices have steadily increased for several years. Since spring 2014, replacement female prices have remained at record levels as well. It is only reasonable that bull prices would follow the trend. This has led many producers to explore options to owning enough bulls to cover their cows in a defined breeding season. Estrus synchronization and timed artificial insemination (AI) are an economically viable alternative to owning a bull if the producer has multiple bulls. There are many benefits to synchronization and AI, including a tighter calving season, increased weaning weights from older calves and better genetics.

The tighter calving season is a result of estrus synchronization and timed AI, followed by natural breeding for the remainder of a 90-day season. Some scenarios are explored in the tables. Each of these assumes a 50-cow herd with a 94 percent conception rate; calving In March and weaning in October. Compared to natural service for 90 days (Table 1), the synchronization/timed AI program (Table 2) can significantly improve subsequent calving distribution. It is not uncommon to see a 65 percent or higher conception rate in the first 30 days of the calving season when using timed AI followed by natural bull exposure. More calves born early in the calving season will be older and weigh more at weaning. The value of the pounds of beef produced in each breeding system was estimated using the forecasting tool at www.beefbasis.com for mid-October.

Table 1

Typical Calving Distribution Using Natural Bull Service in a 90-day Season						
	Percent calving	Number of calves	Age at weaning, days	ADG, pounds	Total pounds weaned*	Avg. calf weight, pounds
First 30 days	40%	19	213	2.2	10,423	549
30-60 days	35%	16	183	2.2	7,722	483
60-90 days	25%	12	153	2.2	4,999	417
Total pounds					23,144	483
Total Gross Revenue @ $253.62 per hundredweight					$58,698	
*Assumes an 80-pound birth weight						

Table 2

Typical Calving Distribution Using Timed AI and Natural Bull Service in a 90-day Season						
	Percent calving	Number of calves	Age at weaning, days	ADG, pounds	Total pounds weaned*	Avg. calf weight, pounds
First 30 days	64%	30	213	2.6	19,014	634
30-60 days	26%	12	183	2.2	5,791	483
60-90 days	10%	5	153	2.2	2,083	417
Total pounds					26,888	511
Total Gross Revenue @ $248.84 per hundredweight					$66,909	
*Assumes an 80-pound birth weight						

Additionally, most producers will be able to buy better growth genetics from an AI bull stud than they could afford to purchase with the live animal for natural service. Therefore, the AI-conceived calves are likely to have better average daily gain (ADG) values than those conceived through natural bull service. During fall 2014, bulls with high growth genetics (weaning and yearling EPDs in the top 20 percent) have been selling in the $7,000 to $9,000 range. In a multiple bull battery, timed AI can reduce herd bull requirements by 50 percent, thus saving the purchase cost of a replacement bull.

The gross revenue increase for timed AI followed by natural breeding is $8,210. The cost of the estrus synchronization and timed AI program was $50 per head, for a total of $2,500. This includes the cost of synchronization, semen and an AI technician. No cost was assigned for labor to process the cows three additional times through the chute since these costs are highly variable. Thus, the net increased value of the calf crop due to the estrus synchronization and timed AI program is $5,710. Now add in the savings of not purchasing an additional bull, amortized over a five-year life span ($7,000 to $2,000 salvage value/five years=$1,000) and the annual maintenance cost of the bull ($400). This equates to an annual total increase in revenue to the ranch of $7,110 for a 50-cow herd.

Before you buy your next bull, consider if an artificial insemination program is right for your operation. It does require three additional trips through a chute, but the potential increase in revenue is significant. ■

Rangelands produce important ecosystem services

by Corey Moffet / camoffet@noble.org

While participating in high school FFA and even more so during college, my perception of the landscape around me was transformed. Initially, I perceived the outdoor environment as a little grass, a few weeds and some trees. I eventually came to see the world as composed of many different species – little bluestem, sideoats grama, western ragweed, prairie coneflower, post oak and Eastern red-cedar – just to name a few. In reality, nothing had changed; but the way I saw it and thought about it had changed. I observed that landscape variation was typically not random – it exhibited patterns. These patterns were largely related to soil, management and climate.

Observation of these patterns leads to expectations about where certain plants should be found. For example, native pecans grow in deep soils, especially beside streams and rivers. In the trans-Pecos of Texas, south-facing slopes have plants more tolerant of hot, dry conditions than do the north-facing slopes. Suddenly, the introduced smooth brome I saw waving on the prairie in *Dances with Wolves* was just as out of place to me as a contrail in the sky of an old Western. It was learning about plants that had allowed me to actually see individual species and their patterns. This helped me develop intuition about where the species would occur.

There is a principle of linguistic relativity that holds that the way we conceptualize our world is influenced by the structure of our language. I'm not sure this principle was intended to apply to the effects of our vocabulary, but, for me, expanding my vocabulary by learning about plant species enabled me to conceptualize my world differently. In 2005, the United Nations Millennium Ecosystem Assessment popularized the term "ecosystem services" and defined four categories of these services: provisioning, regulating, supporting and cultural services. About 35 percent of U.S. lands are classified as rangeland, and they provide our society with a variety of goods and services that support our standard of living and quality of life. Just like the incomplete landscape I saw as simply grass, weeds and trees, I wonder if our understanding of the services provided by our rangelands is not also a bit incomplete.

I suspect many people when asked, "What 'services' are derived from rangelands?" would simply answer "Raising cattle." Cattle are certainly one of the provisioning services rangelands provide, but would they also know that genetic resources, fresh water, deer and other wildlife species are also provisioning services derived from rangelands? What about the regulating services provided to air, water and erosion regulation as well as climate regulation via carbon sequestration? What about supporting services for nutrient cycling, water cycling and soil formation? What about the non-material cultural services such as aesthetic experience or recreation?

Would learning about all the ecosystem services our rangelands produce result in broader thinking about the state of our rangelands? Could we better communicate with our urban neighbors about both the market and non-market services that we provide? Would it open dialog about other services that are important and provide an opportunity to critically assess how well our rangelands are providing these services? Would this then encourage us to seek solutions where these services are being produced below expectation?

Ecosystem services have always been with us, but in some cases we just hadn't put names to them. Learning more about what ecosystem services are and what impact our management has on them will give us a more complete picture of what rangelands really produce. It will also provide an opportunity for greater dialogue about the way we manage these rangelands and the tradeoffs that exist among various ecosystem services so that we can produce the best combination of benefits for society. ■

Data analysis provides value for receiving stockers

by Ryan Reuter / rrreuter@noble.org

This article originally appeared in the Jan. 2012 Ag News and Views *newsletter.*

During the course of conducting grazing research at the Noble Foundation, we routinely receive and "straighten out" stocker cattle. Many of these cattle are sourced from sale barns and would be considered to be at high risk for contracting bovine respiratory disease (BRD, also known as shipping fever). In the fall of 2006 and 2007, we received 858 such cattle and tracked their performance and cost on an individual animal basis through our receiving program. These cattle averaged 444 pounds when we received them; they came from sale barns in Oklahoma and Texas. Their frames were medium and large with number 1 and number 2 muscle score, and they were predominantly black- or grey-hided. Fifty-one percent of the cattle were bulls when we received them, with the remainder being steers. Nineteen percent of the cattle required dehorning.

We received them over approximately three to four weeks in each year and put them through a standard receiving protocol. The processing protocol included vaccines, implants, body weights, dehorning, etc. We castrated all the bulls, a portion of them by traditional surgical castration and the rest by banding. We also gave all the cattle an injectable antibiotic, half getting Micotil® and half getting Excede®. Following processing, we housed the cattle in a grass trap for approximately 42 days and gave them access to round bales of rye hay and 4 pounds per day of a pelleted feed. We checked the cattle every day and treated sick animals as they were identified.

We discovered several interesting trends in our data set:

1. Bulls that were banded gained less than steers (0.44 pounds per day difference), but bulls that were surgically castrated performed similarly to steers.
2. Steers that required dehorning gained 0.15 pounds per day less than cattle with no horns.
3. There was no gain difference between the two antibiotics.

Some other observations:

- In 2006, cattle performance was dramatically better than in 2007; but the cattle in 2007 would have made more profit because the cattle market improved during the receiving period.
- Cattle averaged 1.36 pounds per day gain, but individuals ranged from -1.90 to 5.29 pounds per day.
- Total receiving costs averaged $103.23 per head and ranged from $63.45 to $802.95 per head (for one that died).
- Calves that got sick gained 0.70 pounds per day less and cost $33.47 more to receive than calves that did not get sick.
- In our data set, a theoretical "good" animal (i.e., a polled, healthy steer) would be expected to gain 1.65 pounds per day and cost only $1.12 per pound of gain to manage for 42 days. A theoretical "bad" animal (a horned, banded bull that got sick) would only be expected to gain 0.36 pounds per day and would cost over $7 per pound of gain to receive!

Using this data, we changed several aspects of our receiving program to make it more cost-effective. Some caution should be used when comparing our results to those from your own management system. Your system and cost structure is likely different than ours and may generate substantially different results. However, we think collecting and analyzing this kind of data is important for stocker producers. It will help you understand your operation better and allow you to make better and more informed management decisions. ■

CONTENTS

EVENTS

Prescribed Burn Workshop
Time: 8:30 a.m.-5 p.m.
Date: Jan. 14-15, 2015
Location: Noble Foundation Pavilion
No Registration Fee

Pecan Pruning Workshop
Time: 9 a.m.-12 p.m.
Date: Feb. 3, 2015
Location: Mike Bynum's Orchard, 6681 Woodford Road, Springer, Oklahoma
No Registration Fee

Backyard Food Security: Small-scale Food Production and Preservation Options
Time: 7-9 p.m.
Date: Feb. 10 and 17, 2015
Location: SOTC, Seminar A, 2610 Sam Noble Parkway, Ardmore, Oklahoma
No Registration Fee

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

Ag News and Views is published monthly by the Agricultural Division of The Samuel Roberts Noble Foundation. Current and past editions of *Ag News and Views* are available at www.noble.org/ag/news-views/. Free subscriptions delivered by email are available at www.noble.org/ag/news-views/sign-up/. The Noble Foundation encourages the republication of *Ag News and Views* articles. For publication guidelines, contact J. Adam Calaway, Director of Communications, at jacalaway@noble.org. High quality electronic versions of photos and graphics are available.

THE SAMUEL ROBERTS NOBLE FOUNDATION
The Samuel Roberts Noble Foundation
2510 Sam Noble Parkway
Ardmore, Oklahoma 73401
Phone: 580.223.5810

Address Service Requested

Non-Profit Org
U.S. Postage
PAID
Permit No 2000
Okla. City, OK