

## AGRICULTURAL DIVISION RESTRUCTURING

# New center advances agricultural systems and technology

by Evan Whitley, Ph.D. / ewhitley@noble.org



### Research in the

Agricultural Division has evolved over the decades, and much of it is dedicated to conducting applied research that will help farmers, ranchers and land managers improve their operations, in part through technology. Oftentimes, the ideas for these research projects come from questions producers ask the Noble Foundation agricultural consultants about real-life situations happening on their operations.

The Center for Advanced Agricultural Systems and Technology (CAAST) brings together existing research programs that strive to answer these producer questions through research related to the sustainability of agriculture production systems in the Southern Great Plains.

CAAST is one of four new centers of excellence developed out of the Agricultural Division's restructuring process.

Two key words, which appear in this center's name, drive the center – systems and technology.

These two aspects underscore the center's focus areas, including forage agronomy and cover crops, range ecology/management, cattle manage-



ment, and soil health.

We don't want to look at these areas through a tunnel. It is important to look at agricultural systems on a broader level, and we want to conduct research with the awareness that one area will impact others.

At the same time, the challenges facing agricultural producers are too big to be viewed solely by just one organization. Collaboration, like in all parts of the Agricultural Division reorganization, will be critical to helping us provide producers with the best advice and solutions possible.

Collaboration emphasizing research related to improving agricultural systems will occur within the Noble Foundation across divisions – with help from researchers in the Plant Biology and Forage Improvement divisions – as well as outside the organization in conjunction with universities, government agencies and industry partners.

Technology will continue to play an integral role in improving agricultural systems. An important function of CAAST will be developing and testing new and innovative technology. ▶

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While new technologies can be excellent tools for agricultural producers, they can be expensive to adopt. Producers may not have the time or resources to comprehensively look into a specific new technology and how it might benefit their operation, especially since so many new technologies are constantly being developed.

The Noble Foundation has the

resources and capabilities to vet these new technologies and provide this information to producers. We'll test these new technologies within our existing agricultural systems and work with Producer Relations to help agricultural producers effectively apply them to their operations.

By taking a systems approach to looking at applied agricultural

research and examining advancements to existing technology available to agriculture, CAAST's ultimate goal is to provide the information, tools, technologies and training needed for agricultural producers to adopt science-based best practices to enhance management and sustainability of agricultural systems. ■

## WILDLIFE

# Pond dam repair offers opportunity to improve design

by Russell Stevens / rstevens@noble.org



**Thirty-five** years ago, while growing up on a cow-calf operation and moving irrigation pipe by hand in the summer heat to water bermuda-

grass for hay production, I vowed to never again curse rain. Dry years that we have recently experienced only strengthened my resolve. To be honest, the record rainfall month of May 2015 in southern Oklahoma softened my standpoint. I've had to repair a leak in the roof of my home, replace a \$550 pressure tank due to flooding in my well house and hope the wash on the back side of my duck marsh dam did not grow before it could be repaired. But, I've managed to maintain a civil tongue toward the much needed rain that we were blessed with. Others were not nearly as fortunate. Many lives were lost and much more extensive damage occurred to property, buildings and roads.

Some pond dams suffered damage similar to my duck marsh or were completely washed out, leaving

those pond owners to contemplate repair. Repairing a washed-out pond dam is expensive, not to mention the cost of restocking fish or providing an alternate source of water to livestock. However, there may be an opportunity to improve spillway design and reduce or eliminate future problems.

Two types of spillways can be used when constructing or repairing pond dams: principal and auxiliary. All ponds that capture runoff require auxiliary, also called emergency, spillways. Principal spillways minimize the use of auxiliary spillways and consist of two types: hooded inlet (Fig. 1) and drop inlet (Fig. 2). A hooded inlet spillway consists of a pipe installed through the dam at an angle so the pipe is at the desired water level on the front of the dam and at or near the bottom on the back of the dam. An anti-vortex plate is installed on top of the end extending through the front of the dam to more effectively utilize pipe capacity, and one or two anti-seep collars are usually installed around the pipe in front of the center of the dam to prevent water seepage

through the dam next to the pipe.

A drop inlet also consists of a pipe installed through the dam. It differs from a hooded inlet in two ways: the pipe is installed through the bottom portion of the dam and a riser is attached vertically to the end extending into the pond. The top of the riser



Fig. 1. Hooded inlet



Fig. 2. Drop inlet



Fig. 3. A drop inlet spillway with anti-seep collars (USDA-NRCS Agriculture Handbook 590 "Ponds – Planning, Design, Construction").

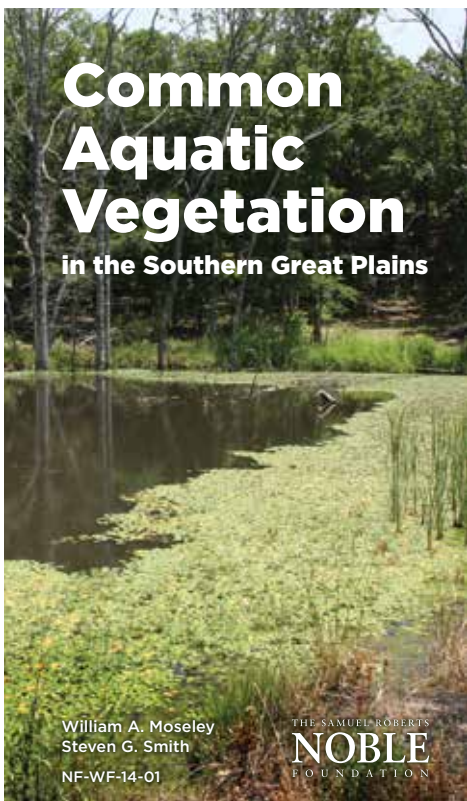
is set at the desired water level. Drop inlets are also installed with anti-seep collars (Fig. 3).

An auxiliary spillway is usually constructed at one end of the pond dam on soil or bedrock. It is designed to allow water flow around the end of the dam and back into the channel before breaching the dam. Auxiliary spillways constructed on soil should be well vegetated. On highly erodible soils, auxiliary spillways should be gently sloped and are sometimes lined with riprap, or larger sized rock, or concrete.

Auxiliary and principal spillways are installed in a stair-step-down manner from maximum dam height. Auxiliary spillways should be at least

3 feet below the top of the dam. Principal spillways should be installed at least 2 feet below the height of the auxiliary spillway. Pipe size for drop- and hooded-inlet spillways should be sufficient to handle five- to 25-year floods based on the watershed acres supporting the pond.

Principal spillways increase construction costs but, if designed and installed correctly, should prevent costly repairs and prevent fish immigration into the impoundment from downstream. For more information, refer to Agriculture Handbook 590 "Ponds – Planning, Design, Construction" at [nrcspad.sc.egov.usda.gov/DistributionCenter/product.aspx?ProductID=115](http://nrcspad.sc.egov.usda.gov/DistributionCenter/product.aspx?ProductID=115). ■



## Common Aquatic Vegetation in the Southern Great Plains

William A. Moseley  
Steven G. Smith  
NF-WF-14-01

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**NOBLE**  
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*Common Aquatic Vegetation in the Southern Great Plains*

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[www.noble.org/store](http://www.noble.org/store)

## Summer Burn Workshop (location changed)

Time: 8:30 a.m.-5 p.m.

Date: July 21-22, 2015

Location: Noble Foundation Oswald Road Ranch

No Registration Fee



## AG ALERT

### FDA ruling impacts ranchers

The Food and Drug Administration has amended its animal drug regulations regarding veterinary feed directive drugs. The ruling requires livestock producers to reach out to their licensed veterinarians to obtain access to antibiotics.

**The Veterinary Feed Directive will go into full effect Oct. 1, 2015.**

For more information, visit [www.federalregister.gov/a/2015-13393](http://www.federalregister.gov/a/2015-13393). A prerecorded webinar from the National Cattlemen's Beef Association, *Preparing Cattlemen for Changing Antibiotic Use Regulations*, is available at <http://bit.ly/antibiotic-use-webinar>.

# Online tool makes grazing record-keeping more productive

by Chad Ellis / crellis@noble.org



## Keeping grazing

records to make management decisions is essential in a grazing management operation. For most producers, these records' great-

est value is as a tool for planning the future year's grazing including pasture rotations, stocking rates and timing of grazing. In addition, records are an important item for any grazing lease arrangement as well as participation in government conservation programs.

Many ranchers make management decisions on a daily basis without adequate supporting information or without using the records they have written down. Records are a tool and only useful if you use them. But, if you're like me, records are very cumbersome; they are found on the back of a calendar, napkin, or feed sack on the seat or dash of the pickup. As managers, we must sort through dozens of records or files to draw a clear picture of how, when and to what degree a particular pasture was grazed in a certain timeframe, or when and where a specific management group was grazed.

To address the cumbersome nature of keeping and reviewing grazing records, the Montana Grazing Lands Conservation Initiative (GLCI) spearheaded the development of the GrazeKeeper. GrazeKeeper was developed by ranchers for ranchers as a method to plan and record grazing activities in a manner that allows reports to be created and pulled at will.

## What is GrazeKeeper?

GrazeKeeper is an online application designed as a tool to inventory, mea-

sure the degree of grazing on pasture, track livestock movements, and most importantly to report livestock movements by pasture or management group while providing a visual and actual record of available forage. GrazeKeeper will help determine the effectiveness/feasibility of managing grazing lands, allowing managers to make sound decisions and maximize economic return for managing their ranch.

There are three major areas of focus in the program: plan, record, and reports (tracking, pasture use, livestock, weather).

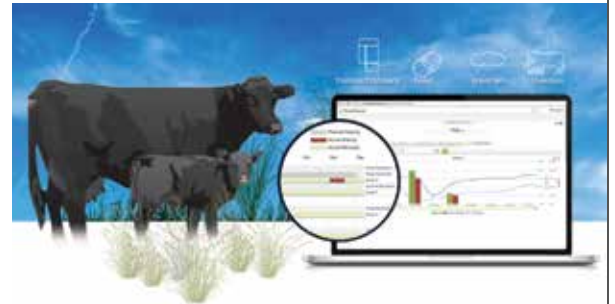
## Why use GrazeKeeper?

GrazeKeeper is the first of its kind. It is a grazing record-keeping, online application with the capability to collect information for each pasture including:

- Name of pasture.
- Size and location of pasture.
- Type of vegetation per pasture (manually input or use a dropdown option for general description of vegetation – native range, pasture, etc.)
- Available grazeable acres in each pasture.
- Number of days grazed during each grazing event, animal unit months per acre, cow days per acre or stock days per acre.
- Average weight per head or animal unit, recovery period (turn-in dates and take-out dates).
- Fertility inputs (if applicable).
- Supplemental feed (if applicable).
- Amount of rainfall/precipitation.
- Residual forage height.
- One of the major features in GrazeKeeper is the weather feature that



## GrazeKeeper



uses the National Oceanic Atmospheric Administration's (NOAA) National Weather Service, which is updated hourly into locations identified with Google Maps. Ultimately, the program is intended to graduate to Google Earth, which will allow tracing of pasture boundaries directly into the program and assist with determining usable and nonusable acres in each designated pasture.

When the plans are in place, the program allows the user to query the input data/information and receive reports by specific pasture and/or management groups. This three-dimensional feature is really what sets this program apart from any others.

The Montana GLCI started the GrazeKeeper project four years ago and is still working toward the end product, which has the potential to provide land managers with a very useful tool for record keeping, monitoring, and providing needed reports to inform decisions about the grazing lands and livestock they manage. Interested users can sign up for GrazeKeeper at [www.grazekeeper.com](http://www.grazekeeper.com) under a free 90-day trial period, which offers full functionality of the program and its valuable reports to users. ■

# Summer weed management promotes healthy pastures

by James Locke / [jmlocke@noble.org](mailto:jmlocke@noble.org)



**We usually** think of pasture weed management as a springtime activity, and rightly so. If early-season weeds are not controlled, they will compete

with desirable forages for space, nutrients, moisture and sunlight. Many of our common pasture weeds are warm-season species that germinate early in the season, and early management can often provide season-long control. If, for some reason, these early season weeds are not managed, the options are limited. Often, they are too large to cost-effectively control with herbicides, and even if we did, they have already caused yield and quality losses. Although mowing pastures is discouraged, in some situations it can be used to remove top growth, allow forage grasses to regrow and improve livestock access to the new growth. Before mowing a pasture, make sure that mowing the weeds is worth more than the value of the forage that will be cut down with them.

While most weeds germinate in the spring, some will germinate later in the growing season and will not be present when springtime herbicides are applied. There are also perennial weeds that are controlled better by late-season herbicide applications. While there are many weeds that can cause summer and late-season problems, the following are a few that I get the most calls about. For other weed species or general management considerations, there are numerous Noble Foundation and extension publications available.

Woolly croton (doveweed, goatweed) is a warm-season annual

with erect growth form and is covered with dense hairs. Its seeds are excellent food for a variety of birds, so if dove or quail are a priority, consider that before controlling woolly croton. It is relatively easy to control with a wide range of herbicides. When it is less than 4 inches tall, 2,4-D does a very good job at a low cost. If allowed to get larger than 4 inches, Weedmaster, GrazonNext and Grazon P+D all do a good job. Woolly croton is a problem because much of it germinates after spring herbicide treatments have been made, and it can have multiple flushes during the season. If this is the primary weed species in a pasture, it may require multiple herbicide applications for season-long control.

Carolina horsenettle and silverleaf nightshade are both warm-season perennials with sharp spines on their stems and leaves. Reasonably good control can be obtained with GrazonNext, Grazon P+D, Cimarron Max or Weedmaster applied from full bloom through fruiting.

Grassbur, or sandbur, is a warm-season annual or short-lived perennial grass that produces seed capsules armed with sharp thorns. The only herbicides labelled for use during the growing season in pastures are Pastora and Panoramic. Pastora provides good control of grassbur seedlings, but they must be less than or equal to 1.5 inches tall and spray coverage must be adequate. Panoramic provides very good control but has a high risk of serious grass injury. Like woolly croton, grassbur can have multiple flushes from late spring through the fall and may require more than one application. For more information on grassbur control, refer to [www.noble.org/ag/soils/sandburs/](http://www.noble.org/ag/soils/sandburs/).

[www.noble.org/ag/soils/sandburs/](http://www.noble.org/ag/soils/sandburs/).

For any of these herbicide options, ensure that the weeds are actively growing and not stressed due to drought, insect pressure, etc., at application. Also, refer to the herbicide label for specific application instructions, rates, precautions, etc. Remember, **THE LABEL IS THE LAW**.

In addition to herbicides, other practices can reduce summer weed problems. It is important to maintain a solid forage stand that does not allow weeds space to establish. Maintaining proper stubble heights, with appropriate stocking rates and grazing management, can significantly improve the density and competitiveness of forage stands. Also, ensuring adequate fertility and acceptable pH will help make forage grasses more competitive with weeds. By integrating these best management practices with herbicides when needed, one can have clean, productive pastures all season long. ■

Disclaimer: Reference to specific products is not intended to be an endorsement of these products to the exclusion of others that may have



*A bermudagrass pasture infested with woolly croton*

# Cost management keeps cow-calf production profitable

by Steve Swigert / jsswigert@noble.org



**In the last 10** years, there has been dramatic volatility in the cattle and grain markets. This condition has forced producers to reevaluate how they go about doing business. Only a few years ago, corn prices had tripled and there were significant increases in the prices of fertilizer and fuel. While it would be

great to think the price of grains, fertilizer and fuel could return to 2005 levels, that doesn't appear probable. In the last five years, the price of calves and cows has more than doubled, making it possible to remain profitable in the face of high input prices. The question is, how much longer will prices maintain these levels? These price levels and the fluctuation have made the prospect of making money in an agricultural business challenging.

While the Livestock Marketing Information Center graph for 2015 shows average cow-calf producers have shown a positive return the last five years, there are still challenges ahead for the cow-calf producers. With increasing cow costs, cost of replacement females and lower calf prices at some point in the future, maintaining positive returns may be difficult.

So what should a cow-calf producer do to operate now while planning ahead for lower calf prices?

First thing, determine the cost of production for the cow-calf enterprise and the breakeven for each segment of retained ownership. Second, determine ways to decrease operating costs. In this time of increased calf prices, most operations have had cow costs increase to levels that won't be profitable if calf prices return to pre-2011 levels.

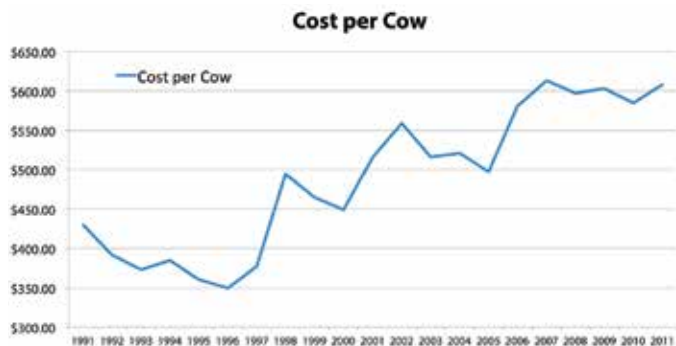
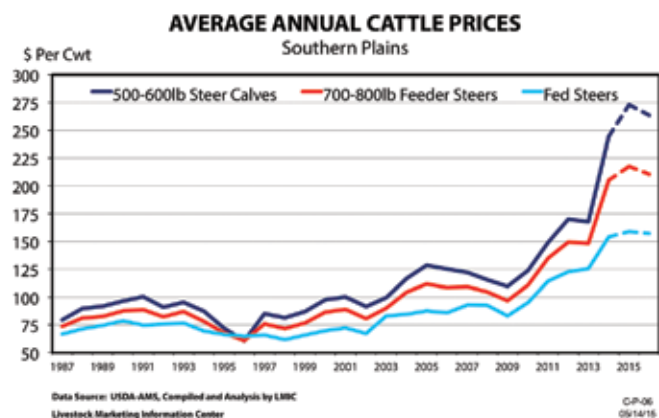
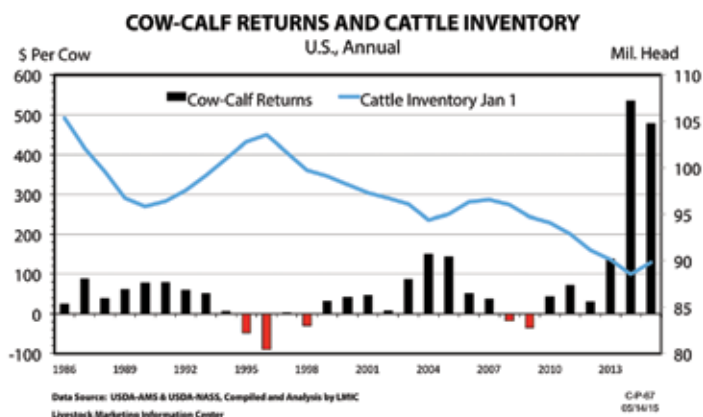
To bring expenditures under control, carefully analyze each part of the operation to determine areas for improvement. For many operations, cow costs have risen to \$600-plus per cow, with feed, fuel, fertilizer, depreciation and labor driving much of the increase.

With cattle, three income factors primarily determine the profitability of producing calves: calf prices, and bred and cull animal prices. All three of these factors are primarily determined by the market. Cost of production, on the other hand, is under direct control of the manager. He/She will make the decisions that determine the inputs of the operation.

To be competitive and profitable in the long run, each operation needs to analyze the expenditures carefully,

but this doesn't mean that all of the costs should be reduced. It just means to analyze all of the costs and be a very efficient producer.

Let us know if you have any questions about determining your specific cost of production. ■



# Hay-buying tips help producers select best value

by Clay Wright / jcwright@noble.org



**The haying** situation this spring and early summer has been a little different than usual due to the prolonged and widespread rains. Historically, producers with

winter annual forages to bale, like ryegrass and graze-out wheat, could compare the risk of cutting hay early and getting it rained on during hay curing versus the certainty of lower quality by waiting to cut it. However, this year, excessive rainfall has taken most of those decisions away and forced producers to just wait it out. With dry weather in the forecast and fields drying out, there will be many acres of very mature winter annual hay cut in the next few weeks, along with more mature first-cuttings of many warm season forages. The bright spot is that there should be plenty of hay available for purchase from now into summer. If that turns out to be the case, then you can and should be able to “shop” for the best hay available.

Regardless of the year, you should always get a composite sample from all individual lots of hay you are considering buying. Take cores or grab-samples from at least 12 to 15 individual bales (or 15 to 20 percent of the bales, whichever is more), then have it analyzed at least for crude protein and total digestible nutrients before you purchase it. Analysis is the only way to know the feed value of the hay. The cost of supplementing a cow through the winter on 6 percent protein hay versus 9 percent protein hay is huge. You can get results from most labs quickly enough to make timely buying decisions.

While collecting your sample, see



if it has the general characteristics of quality hay. It should be leafy, fine-stemmed and green, with a good smell. You'll find few, if any, seed heads, blossoms, or weeds, and no foreign materials. Lower quality hay will have fewer leaves, coarser stems and more seed heads/blossoms, indicating more mature plants. It may be brown with a musty or moldy smell.

Pay special attention to wheat hay. There are many acres of wheat this year that were intended for grain harvest but will be hayed instead. Much of it will be from bearded varieties. The awns (beards) in these varieties can cause mouth injury and soreness when fed as hay to cattle. As you're pulling the sample for analysis, check for beards. Bearded wheat hay can be successfully fed with other hay or chopped to minimize problems, but you still need to be aware of what you're buying.

The phrase “rained-on hay” always bears caution in terms of decreased quality. However, the extent of

damage on hay that was rained on after cutting but before baling depends on several things. Less than an inch of rain on freshly cut hay that did not had time to dry out much has been shown to have little to no effect on quality. However, even minimal rain on hay in the windrow that is nearly dry can cause significant losses in quality. Also, hay that is baled too wet can get hot and mold in the bale, which decreases nutritional value tremendously.

One last recommendation is to buy hay by the ton not by the bale. Once an analysis has helped you identify the hay you want, the final deal should be on weight. This will involve a scale at some point in the transaction.

Hopefully, this summer is a buyer's market for hay. If it is, then take your time and find the best value to provide your needs this fall and winter, and consider purchasing enough hay for an additional year or two if you have sufficient storage. ■

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## EVENTS

### Winter Pasture Stocker Seminar

Time: 1-5 p.m.

Date: July 9, 2015

Location: Southern Okla. Tech. Center, 2610 Sam Noble Pkwy, Ardmore, Oklahoma  
No Registration Fee

### Summer Burn Workshop, (location changed)

Time: 8:30 a.m.-5 p.m.

Date: July 21-22, 2015

Location: Noble Foundation Oswalt Road Ranch  
No Registration Fee

### The Pecan Pest Management Workshop

Time: 9 a.m.-12 p.m.

Date: Aug. 18, 2015

Location: Noble Foundation Kruse Auditorium  
No Registration Fee

For more information or to register, please visit [www.noble.org/agevents](http://www.noble.org/agevents) or call Maggie Scott at 580.224.6375. Preregistration is requested.

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