34th Kentucky Alfalfa Conference Proceedings

Volume 34, Number 2
Garry Lacefield & Christi Forsythe, Editors

FEBRUARY 20, 2014
Western Kentucky University Expo Center
Bowling Green, KY

Sponsored by
University of Kentucky • College of Agriculture, Food and Environment • Cooperative Extension Service
Kentucky Forage and Grassland Council
Schedule for the Day

8:30    Registration, visit exhibits, silent auction

9:15    Welcome – Dr. Jack Rudolph

9:30    Role and Importance of Alfalfa in WKU Teaching/Research/ Farming Programs
        – Dr. Elmer Gray

10:00   Alfalfa baleage/silage preservatives: Do they work? Are they Economical? –
        Dr. Ray Smith

10:30   Break, visit exhibits, silent auction

11:00   Alfalfa – Australia – Kentucky –
        Dr. Garry Lacefield, Dr. Ray Smith, and Ms. Traci Missun

11:15   Alfalfa for Summer Grazing –
        Dr. Roy Burris

11:15   Alfalfa for Summer Grazing –
        Dr. Roy Burris

11:30   Why aren’t big square balers used more in Kentucky? –
        Mr. Tom Keene

11:45   Advances in Alfalfa Promotion – Mr. Bill Talley

12:00   Lunch, visit exhibits, silent auction

1:00    Alfalfa Awards and Silent Auction Results

1:30    Adjustments and Maintenance of Haying Equipment
        Mr. Clayton Geralds
        Mr. John McCoy
        Mr. Cris Scudder

2:45    Discussion

3:00    Adjourn
FOREWORD

This conference marks the thirty-fourth consecutive year we have come together to address problems and potentials of alfalfa. We are certainly encouraged with the interest in and opportunities for alfalfa in Kentucky. We are optimistic that we will observe expansion in acres, yield, and markets. It is our hope that the information presented herein and the discussions of the day will be of value to each of you in your alfalfa program.

On behalf of the Program Committee, I would like to express our thanks to each of you for your faithful participation over the past thirty-three years. I also want to thank all speakers, moderators, committee members, and workers for their many contributions.

My personal thanks to the Program Committee, Kentucky Forage and Grassland Council, Western Kentucky University faculty and staff and Kentucky Department of Agriculture for their encouragement and assistance. I also want to thank all the exhibitors for their important contributions and financial support. A special thanks is extended to Mrs. Christi Forsythe for her assistance in preparing and editing the program and proceedings.

Garry Lacefield
Program Chairman
XXXIV Annual Kentucky Alfalfa Conference

Visit our Extension Forage Website

http://www.uky.edu/Ag/Forage
KENTUCKY ALFALFA AWARDS

The Kentucky Alfalfa Awards Program was initiated in 2000 at the 20th Anniversary of the Kentucky Alfalfa Conference. The Awards Program is funded annually from revenues generated each year for the Silent Auction during the Annual Conference.

<table>
<thead>
<tr>
<th>Year</th>
<th>Warren Thompson Industry Award</th>
<th>Charlie Schnitzler Producer Award</th>
<th>Garry D. Lacefield Public Service Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>Don Eckhoff</td>
<td>Christopher Gerals</td>
<td>Elmer Gray</td>
</tr>
<tr>
<td>2013</td>
<td>Sam Stratton</td>
<td>Tony Chapman</td>
<td>Dennis Hancock</td>
</tr>
<tr>
<td>2012</td>
<td>Mark McCaslin</td>
<td>Don Moore</td>
<td>Gene Olson</td>
</tr>
<tr>
<td>2011</td>
<td>Bill Bracy</td>
<td>Todd Clark</td>
<td>Dan Undersander</td>
</tr>
<tr>
<td>2010</td>
<td>Jeff Medlin</td>
<td>Charles Powell</td>
<td>Don Ball</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Joe Bouton</td>
</tr>
<tr>
<td>2009</td>
<td>Ken Carpenter</td>
<td>John McCoy</td>
<td>Ray Smith</td>
</tr>
<tr>
<td>2008</td>
<td>Mike Phillips</td>
<td>Clayton Gerals</td>
<td>John Baylor</td>
</tr>
<tr>
<td>2007</td>
<td>Bret Winsett</td>
<td>Bill Payne</td>
<td>Dan Grigson</td>
</tr>
<tr>
<td>2006</td>
<td>Scott Cooper</td>
<td>George Eckler</td>
<td>Laurie Lawrence</td>
</tr>
<tr>
<td>2005</td>
<td>Barney Booher</td>
<td>Roy Reichenbach</td>
<td>Ken Johnson</td>
</tr>
<tr>
<td>2004</td>
<td>Gary Coughlin</td>
<td>Minos Cox</td>
<td>Mike Collins</td>
</tr>
<tr>
<td>2003</td>
<td>Phil Howell</td>
<td>Lee Robey</td>
<td>Monroe Rasnake</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Jimmy Henning</td>
</tr>
<tr>
<td>2002</td>
<td>Tom Keene</td>
<td>John Nowak</td>
<td>Billy Ray Smith</td>
</tr>
<tr>
<td>2001</td>
<td>Bill Talley</td>
<td>Larry Jeffries</td>
<td>Timothy H. Taylor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>W. C. Templeton, Jr.</td>
</tr>
<tr>
<td>2000</td>
<td>Warren Thompson</td>
<td>Sue Schnitzler*</td>
<td>Garry Lacefield</td>
</tr>
</tbody>
</table>

*Accepted on behalf of her father who was tragically killed in a farming accident on March 11, 1991.
# Table of Contents

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role and Importance of Alfalfa in WKU Teaching/Research/Farm Programs</td>
<td>1</td>
</tr>
<tr>
<td>Elmer Gray</td>
<td></td>
</tr>
<tr>
<td>Alfalfa Baleage/Silage Preservatives: Do they Work? Are they Economical</td>
<td>3</td>
</tr>
<tr>
<td>Ray Smith</td>
<td></td>
</tr>
<tr>
<td>Lessons Learned in Australia - UK Forages Study Tour</td>
<td>7</td>
</tr>
<tr>
<td>Garry Lacefield, Ray Smith &amp; Traci Missun</td>
<td></td>
</tr>
<tr>
<td>Alfalfa for Summer Grazing</td>
<td>15</td>
</tr>
<tr>
<td>Roy Burris</td>
<td></td>
</tr>
<tr>
<td>Why aren’t Big Square Balers used more in Kentucky.</td>
<td>21</td>
</tr>
<tr>
<td>Tom Keene</td>
<td></td>
</tr>
<tr>
<td>Advances in Alfalfa Promotion</td>
<td>25</td>
</tr>
<tr>
<td>Bill Talley</td>
<td></td>
</tr>
<tr>
<td>Adjustments and Maintenance of Haying Equipment</td>
<td>29</td>
</tr>
<tr>
<td>Clayton Geralds</td>
<td></td>
</tr>
<tr>
<td>John McCoy</td>
<td></td>
</tr>
<tr>
<td>Cris Scudder</td>
<td></td>
</tr>
</tbody>
</table>
ROLE AND IMPORTANCE OF ALFALFA IN WKU TEACHING/RESEARCH/FARM PROGRAMS

Elmer Gray
Agriculture Professor
Western Kentucky University
Bowling Green, KY

Alfalfa is the oldest and most widely grown forage legume in the world and in Kentucky, where approximately 250,000 acres are produced. It has gained this top position through producing forage suitable for most classes of livestock, by being drought tolerant, and by fixing atmosphere nitrogen.

Over the centuries alfalfa has encountered problems that have been alleviated through breeding and management practices. Bacterial wilt was a major threat early in alfalfa’s introduction into the U.S. Ranger and Buffalo varieties provided wilt resistance. In the 1960s, alfalfa weevil challenged researchers from both public and private agencies and across different disciplines. The search for weevil resistance involved screening thousands of plants. An effective chemical treatment for weevil control was prohibited because of its potential toxicity to human health. Alfalfa continues to be adversely affected by diseases and insects, especially in hot humid climates.

Alfalfa’s high yield of nutritious forage can only be obtained by careful, timely management. The soil must be deep and well-drained with adequate nutrients, especially potassium. For quality of forage, the plants must be harvested or grazed at the proper stage of maturity. Carefully monitored rotational grazing is required for high production and stand longevity. Harvesting alfalfa for feed is difficult because the high moisture content and level of nutrient contributes to microbial activity. Also, drying and transporting can result in leaf loss, lowering nutritious value. The recent application of “wet bag” technology to alfalfa storage has given positive results.

Weed competition has been a major factor in alfalfa seedling survival and stand longevity. The problem is being greatly diminished through the utilization of genetically modified (GMO) varieties that are resistant to glyphosates. Roundup resistant varieties growing on the WKU farm show great promise.

Expectation for an increasing need for alfalfa in Kentucky and beyond is based upon several conditions: greater emphasis on sustainability of food production, demand for more high quality forage in livestock rations, legumes nitrogen fixation, drought tolerance, and environmental protection. Indications are that alfalfa will continue to maintain its status as Queen of forage legumes.
Alfalfa Baleage/Silage Preservatives: Do they Work? Are they Economical

Ray Smith
Extension Forage Specialist
University of Kentucky
Lexington, KY

There are many variables with silage production including - type of silage operation (silo, bunk, tube, or wrapped bale), weather, packing or bale density, speed of covering. Therefore, no two silage crops are ever the same, which is why researchers are reluctant to give blanket statements regarding when and how to use silage inoculants. There has been a lot of good research though in recent years about the effect of silage inoculants under various management and conditions. What follows is an overview of this research and some general recommendations. Much of this overview was taken from a very good fact sheet written by Richard Muck from the USDA-ARS Dairy Forage Research Center in Wisconsin. I have listed how to download this and related publications in the reference section.

I will begin with an overview how the silage inoculants work and the different types of inoculants. In short, silage inoculants work by shifting silage fermentation in a direction that better preserves the crop. That happens when the lactic acid bacteria in the inoculants overwhelm the natural lactic acid bacteria on the crop.

Two types: homofermenters and heterofermenters

There are now two main types of silage inoculants: the traditional homofermentative types, such as Lactobacillus plantarum, the Pediococcus species, and Enterococcus faecium; and the more recently used heterofermentative bacteria, Lactobacillus buchneri. A third type of inoculum combines both. Combining homofermenters with L. buchneri, is beginning to be marketed. Homofermenters get their name because they turn 6-carbon sugar molecules into one product – lactic acid. Heterofermenters produce multiple products. I will mainly discuss the traditional homofermentative types since they make the most sense for alfalfa. With alfalfa the goal is to preserve crop quality as close as possible to that of the crop at ensiling, and the lactic acid bacteria produce a strong acid so they give the best chance for this to occur. One comment though, while lactic acid preserves the crop well, it is not as stable once
silage tube is opened or a plastic wrapped bale is unwrapped, therefore with alfalfa keep exposure time limited except in cold weather.

**Studies with homofermenters**

A review by Kung (1997) of a series of studies showed using homofermentative inoculants reduced pH on average, but not all of the time; and it lowered the pH more often in hay crops versus whole grain silages. The percentage of studies in which the pH dropped was: alfalfa silage, 58 percent; grass silage, 63 percent; corn silage, 43 percent; and small grain silage, 31 percent. In terms of dry matter recovery, it was improved in 38 percent of the trials. In the trials that showed an improvement in dry matter recovery, it improved by an average of 6 percent. When all trials were averaged, the improvement in dry matter recovery was 2-3 percent. Dry matter recovery simply means that the silage maintained it prewrapping weight during ensiling. Under poor ensiling conditions the forage is degraded and carbon dioxide is released.

The most important aspect of silage is whether there is an improvement in animal performance. In the studies that Kung reviewed 27 percent of trials showed an improvement in feed intake; 52 percent showed an improvement in weight gain; and 46 percent showed an improvement in milk production. In the trials that showed improvement, the increases in feed intake, weight gain, and milk production were typically in the range of 3 to 5 percent. Improvement in silage “shelf life” and stability were generally positive in hay crop silages and negative in corn and small grain silages.

**Harvest conditions when inoculants work the best**

While some forage producers use inoculants nearly all of the time – an insurance policy, others strive to use it when they suspect it will be most useful – an educated guess. In the studies outlined earlier in this article, inoculants were used no matter what the harvest condition, so results could be lower than if a forage producer used the ‘educated guess’ approach of when to use inoculants. Research points to the following conditions when positive outcomes are more likely to occur when homofermentative inoculants are used:

- In hay crop silage—wilting times 1 day or less;
- First-cut and fall-cut silage (lower wilting temperatures)

**Wet or dry inoculants?**

Are wet inoculants or dry inoculants the best? There appears to be no research that has specifically studied this issue. However, there is some anecdotal and common sense advice. Any inoculant works only if the bacteria are alive when they’re put on the
crop! Consequently, store them properly – generally in a cool and dry place. This is easier with inoculants applied wet because the packages are small and can be kept in a refrigerator until you need them. With the wet products, don’t use chlorinated water to dilute inoculants unless the chlorine level is less than 1 ppm or unless the inoculant contains chemicals to take care of the chlorine. Chlorine can’t discriminate between the bad bacteria it is meant to kill and the good lactic acid bacteria in your inoculant. Also remember that these bacteria cannot move around on their own; they depend on the forage producer to spread them uniformly across the crop. This is often easier with the wet products that can be sprayed onto the crop at the chopper. So you should choose a wet or dry product based on how well you can keep the product alive both before and while applying, and how well you can get it mixed with the crop.

Summary

Standard homofermentative inoculants (lactic acid producing inoculants are the best route to improve DM recovery and animal performance. They’re a good fit for hay crop silages. There are no good economic studies to prove that prove cost effectiveness conclusively, but most researchers agree under the conditions listed above they are useful. Remember though that the most important thing is proper silage management, especially in a crop like alfalfa. Harvest at the correct stage of maturity, chop or bale at the right moisture, pack tightly or bale tightly, cover the silage or wrap the bales within as soon as possible.


LESSONS LEARNED IN AUSTRALIA - UK FORAGES STUDY TOUR

Traci Missun, Ray Smith & Garry Lacefield
Oldham County Extension Agent for Agriculture and Natural Resources
and
Extension Forage Specialists
University of Kentucky

In September 2013, twenty Kentuckians traveled to Australia to tour farms and attend the International Grasslands Congress. The group included ten county agents, five farmers, four UK faculty/staff and a teacher. This study tour allowed participants to gain a new perspective of agriculture and how Australian farmers deal with adversity. Farmers there face many challenges each year with change in precipitation, ranging from severe drought to flooding. These challenges have forced them to incorporate different methods to be successful, including intensive grazing, use of overhead and drip irrigation for pasture and hay production, and fallow farming.

The planted forages used where the group toured (eastern New South Wales) are primarily alfalfa (called lucerne), ladino and red clover, phalaris (a relative of reed canarygrass), novel endophyte fescue, annual ryegrass, perennial ryegrass, and kikuyu. Kikuyu is a warm season perennial grass similar to bermudagrass but with higher quality. It is the main pasture grass used on the coast and some inland, and it is often overseeded with annual ryegrass in late fall, winter and spring to provide nearly year round grazing. Kikuyu is drought tolerant, withstands high stocking rates, responds well to grazing and is highly competitive with weeds. Like bermudagrass, it responds well to nitrogen fertilizer. Kentucky 31 tall fescue has never been introduced in Australia because of fescue toxicity. Earlier introductions of endophyte free fescue have been largely unsuccessful due to poor seedling vigor and short lived stands. Novel endophyte fescue use is on the rise.

Tour participants traveled in two of Australia’s six states—Queensland and New South Wales. New South Wales alone is nearly eight times the size of Kentucky. Terrain and plants varied in the traveled areas and included coastal land, rain forests, mountains and valleys. The average farm size in New South Wales is about 3,100 acres.

The group’s first stop was the Commonwealth Scientific and Industrial Research Organization near Townsville, Queensland. CSIRO is Australia’s national science agency and one of the largest and most diverse research agencies in the world. They
carry out research much like the United States Department of Agriculture, the National Institute of Health and the National Science Foundation do here in the United States.

One of the first things learned at the CSIRO research farm is that kangaroos are pests. While kangaroos are often considered iconic of Australia, they are pests on farms because they compete with livestock for a limited forage supply. One average sized kangaroo can consume as much forage as a mature ewe. Regulations have increased over the last several decades, and permits are required to hunt kangaroos to reduce populations. Kangaroos were plentiful in areas traveled during the tour.

Just like climate change is debated and studied here, the same is true in Australia. CSIRO is currently working on research assessing methane produced by cattle based on forages consumed. The hope is that farmers can reduce methane by choosing specific forages and grazing systems for their cattle. More information about this and other research can be found online at www.csiro.au.

While this trip focused on forages, the group saw other crops on the drive from Brisbane south into New South Wales. Most notable were the sugarcane fields and macadamia nut groves. One interesting practice in sugarcane production is burning the dry undergrowth leaves when the stands are ready to harvest in the late fall and winter. This practice reduces the amount of material that needs to be transported to the sugar mill. Fires could be seen in the distance while driving at night.

The first farm stop was Rockvale North, home to Rob, Sue and Luke McClenaghan. Their farm includes over 5,000 acres, over 5,000 head of merino sheep and 600 head of cattle. The McClenaghans were the first in their region to use management intensive rotational grazing. This helps them overcome the challenges of low rainfall and drought. The average annual rainfall in the nearest town, Armidale, is about 31 inches (+/- 20 inches). The high variability in rainfall from season to season makes livestock management very difficult. Additionally, this area is also prone to flooding. It is not uncommon for 8 – 10 inches of the annual rainfall to occur in one precipitation event. This means there is less rainfall later when crops may need it the most. As Mr. McClenaghan said, "We don’t wonder if there’s going to be drought – it’s just a matter of when. We are always prepared for drought, because the next one may start next week, next month, or next year."

The McClenaghans’ intensive grazing system has allowed them to farm more sustainably, with reduced fertilizer inputs, improved weed control, and better forage productivity. This has allowed them more resiliency and recovery during and following drought periods.

The biggest income from their farm is the super and ultrafine merino wool. This wool is the grade that is used in high end wool suits that sell for thousands of dollars. Wool value has varied tremendously over the last several years. In 2012, Mr. McClenaghan received $15 per lb. for ultrafine wool. Before the European financial crisis started a few years ago, they sometimes sold the same type of wool for $150 per
lb. The average fleece production per sheep in Australia is about 10 lbs., but the ultrafine merino sheep don’t produce as much (5-8 lbs).

Interestingly, Great Britain’s Prince Charles began a marketing initiative in 2010 called the Campaign for Wool in response to low wool prices. He hoped to encourage interest in this natural fiber and support global wool producers.

Dr. Wal Whalley, Grassland Ecologist with the University of New England, joined our group at Rockvale North. He spoke to the group about forages used on the McClenanaghan farm and in the area. Dr. Whalley’s research on native grasses has proven that landowners can maintain native grass stands and improve pasture productivity with little input. Examples of productive native grasses in this region include several Danthonia species, Kangaroo grass, and Wallaby grass.

Australia is decidedly British in many customs, including afternoon tea. The McClenanaghans welcomed the tour group to the sheep shearing shed for tea following the farm tour. Another British custom witnessed there is driving on the left-hand side of the road. This continued scaring many on the bus when they saw oncoming traffic in the right lane.

The group attended the University of New England Robb College Rural Focus Dinner and Lecture as guests of Dr. Whalley. In keeping with the British influence, dinner guests were greeted with bagpipe music as they entered the building. Robb College is the residential college for agriculture & mining degree programs. Coal and other mineral mining are big industries in Australia. Mining is often at odds with agricultural land use in Australia. Many UK participants were surprised to hear the guest lecturer, a mining industry professional, talk about mining’s role in the area and industry successes.

Extension exists in Australia but personnel are limited, and government support for Extension has decreased in recent years. For example, New South Wales has only one beef specialist, Todd Andrews, serving the state. Todd rode with the group during part of the trip and shared information about beef production. New South Wales farms account for about one-fourth of the country’s beef production, while Queensland farms account for about half. There are many cattle breeds raised on farms in Australia. Brahmin and Brahmin cross cattle are sometimes used because they are better adapted to drought conditions. Angus, Hereford, Shorthorn, Charolais, Belted Galloway, Limousin and Simmental cattle were noted on different farms during the trip.

Todd noted that most Australian consumers prefer grass fed beef because of the higher omega 3 fatty acid content. (According to the U.S. Cattlemen’s Beef Promotion and Research Board, one 3.5-ounce serving of grass-finished beef offers 15 milligrams more omega-3 than other kinds of beef. However, in general, beef is not considered a primary source of omega-3 fatty acids.) But since Australia experiences many drought periods, about 10 % of cattle produced also receive grain to supplement forages.
Some farmers also rely on private agriculture consultants like Ross Watson. Ross rode with the group for two days during the trip. His expertise includes pasture establishment and management recommendations for horse and other livestock farms. Ross shared common farming practices and ways farmers deal with the drought. One of these management tools is fallow farming, and he described a typical rotation: Following barley harvest, ground lays fallow (no crop planted) from December through November of the following year. During that time enough rainfall is collected in the soil to sustain the next crop which is usually sorghum, followed by wheat.

Due to the large areas that must be covered, herbicide application to prepare pastures for new seedings is sometimes done by helicopter. Phalaris and novel endophyte fescue may also be seeded in pastures using helicopters, with livestock used to trample the seed in to sow it.

The next farm stop was Sundown Pastoral near Kingstown, New South Wales. This family farm was founded by Neil Statham in 1964 and is still owned and operated by the Statham family. Sundown backgrounds 80,000 head of cattle each year, primarily on pastured forages. Their prime beef is marketed domestically and exported. Their properties total 143,000 acres. 32,000 acres is planted in novel endophyte fescue and clover. They are the largest purchaser of novel endophyte fescue in Australia, perhaps even in the world. The farm also includes cotton, wheat, sorghum, alfalfa hay and other forage crops.

Dung beetles are purchased and released in Sundown’s pastures each year to help decompose the cattle manure. This helps recycle nutrients for forages, plus it helps control flies and other livestock pests. This concept is not new, but it is certainly not commonplace in Kentucky. Foxhollow Farm in Oldham County has been using this practice during the last few years.

Another practice not new to Kentuckians but certainly one that should be emphasized is training weaned cattle. When Sundown brings weanlings onto the farm they put them in pens with horses and ATV’s to accustom them to people and handling methods. Acclimating cattle to their surroundings and working practices typically results in calmer, easier-to-move animals. Their working facility is large and includes scales and a tag reader system to track each animal.

The group also visited a dairy farm co-owned and managed by Rob Cooper near Upper Manilla. The operation includes 1,000 cows and 800 heifers on 8,000 acres. This area receives only about 25 inches of annual precipitation each year, so irrigation is used on the farm. The dairy herd gets 2/3 of its daily ration from pasture and 1/3 from grain grown on the farm. Mr. Cooper uses GPS collars on the cattle to monitor animal health and heat cycles. UK Extension has researched this practice with several farms in the state, including Harvest Home Dairy in Oldham County.

Like Kentucky, Australia has seen its share of dairy operations being sold or going out of the business. Over the last twenty years, the number of dairies has
dropped dramatically. For example, in just one small region of New South Wales (the Dorrigo Plateau) the number of dairy farm dropped from 150 to 20

Manuka Chaff, owned and operated by David and Martin Wallis, was another farm toured by the group. The Wallises grows oats, wheat and alfalfa—these are chopped to produce fodder called chaff. He also produces baleage. Chaff and baleage are sold for horse and other livestock. These products are processed and bagged on the farm in 20 kilogram packages. They also process and bag crops for other producers, including hemp which is marketed as horse stall bedding.

The most surprising practice at Manuka Chaff was the use of drip tape irrigation installed in alfalfa fields. Because water use is limited there, they decided to install this system to guarantee the success of their alfalfa crops.

The final farm stop before heading to Sydney for the Grasslands Congress was Coolmore Stud. Coolmore is the sister farm to Ashford Stud in Woodford County and Coolmore Ireland. Coolmore Stud is made up of 7,500 acres in the Hunter Valley. The farm has 1,000 horses, including 600 mares that produce around 300 foals. Thirteen international quality stallions stand here each spring. Coolmore also has many shuttle stallions used in Ireland and Kentucky during the northern breeding season and in Argentina and Australia during the southern breeding system.

Coolmore uses rotational grazing systems for thoroughbreds and uses pasture irrigation to maximize production. Coolmore also runs beef cattle on the farm—something typically not seen on Kentucky horse farms.

Attending the International Grasslands Congress gave participants opportunities to meet forage researchers from around the world and hear about findings that could benefit Kentucky farmers. A key point made in the opening session was the rising world population and food production needs. Jimmy Smith, Director General of the International Livestock Research Institute, pointed out that by 2050, 60% more food must be produced to meet needs of population. There is a great demand for meat in diets of those living in developing countries. He predicted that 1/3 of the world’s small farms would become larger to help meet this need, and that the role of the ‘weekend’ farmer was also important in feeding the world.

Another focus of the conference was climate change. Similar to the U.S., it was clear that not all scientists at the conference agree on what constitutes climate change and what effect humans have on climate. One thing scientists seemed to agree on was that a rise in atmospheric carbon dioxide actually favored legume production over grasses.

Concern for the future of forage research and Extension or Extension-like entities was also expressed. The number of forage professionals is not increasing, and speakers noted the need for more people to continue research in this field.
Researchers commented about their need for Extension personnel to communicate their findings with farmers.

The Farmer Forum was a highlight of the conference. Farmers from around the world were filmed and featured in a video highlighting their forage operations. Several of these farmers attended the conference and were available to answer questions.

Through the film, participants could see farms in both developed and undeveloped countries, look at the farm business through each farmer’s eyes, and appreciate the diverse challenges each faces. Perhaps one of the most striking images was a farmer from a developing country who manually harvested forage and carried it to her dairy cows and goats daily. Her forage system was set up this way because of the limited acreage of her farm.

Fayette County farmer Todd Clark was a featured U.S. farmer in the film. He raises turkeys, sheep, cattle, hay and tobacco. His livestock are raised to provide meat for local consumers. It was special for Kentucky participants to see Todd representing Kentucky’s little spot on the globe and share about his farm business.

Most importantly, the film showed that no matter the cultural differences that exist, farmers share many of the same aspirations and needs no matter where they live or the size of their operation. The trip was a once in a lifetime learning opportunity for participants, thanks in large part to graduate student Krista Lea, who organized travel and logistics and was part of the tour group; Dr. Gary Palmer, who provided financial assistance for agent participation; and the Forage & Grassland Foundation, which provided financial assistance for farmer and young scientist participation.
**Alfalfa for Summer Grazing**

*Roy Burris and Garry Lacefield*

Extension Beef Specialist and Extension Forage Specialist
University of Kentucky
Princeton, KY

Alfalfa is most commonly used as a hay crop in the United States. However, with proper management, it can be utilized as a grazing crop with very good results. Liveweight gains per acre are quite high for grazing beef cattle with total season grains of 500 to 800 pounds per acre being reasonable. The authors realized 732 lb/acre of gains on 16 acres of alfalfa in 1991, with beef steers at Princeton.

**Reasons to Graze Alfalfa**

*Alfalfa makes excellent growth during the summer* – Most cool season grasses, like fescue, can almost be dormant during the hot summer months. Alfalfa can make excellent growth during that period of time and is drought tolerant due to its deep root system. Alfalfa can add high quality grazing when cool-season grasses won’t support adequate gains, especially for stocker cattle.

*Reduced machinery costs* – Over 40 percent of the cost of producing alfalfa for hay is machinery and equipment. Many producers, especially with small herds, could graze alfalfa without making any large investment for the long term.

*Lower fertilizer costs* – Eighty percent of the plant nutrients which are ingested are returned to the soil under grazing conditions. However, manure distribution may not be uniform due to concentration around water points and shade.

**Obstacles of Grazing Alfalfa**

*Additional fencing* – Alfalfa should be grazed rotationally. However, this can usually be accomplished mostly with temporary fencing – like polywire.

*Attitudes* – Producers must develop a “grazing” mindset to take care of details. Our experience has been that isn’t nearly as hard as it seems once producers get comfortable with the management requirements.
Stand decline – Short grazing duration with a long rest period is essential. Mimic hay harvesting with the animals. Use a “sacrifice” paddock with good grass sod when fields are wet and muddy.

Fear of bloat – The fear of bloat occurring when grazing pure stands of legumes is prevalent. But the actual occurrence can be minimized or eliminated with management and bloat-control products.

Requirements for Grazing Alfalfa

Establishing the Stand

Requirements for establishing an alfalfa stand for grazing are the same as for hay. A thick, healthy, and productive stand has the greatest potential for animal performance and production per acre. Although purestands can be grazed successfully, alfalfa/grass mixtures have advantages in grazing situations. Alfalfa/grass pastures may minimize bloat and reduce the amount of hoof damage and soil erosion. Alfalfa can compete well with cool-season grasses with adequate fertilization and rotational grazing.

Maintaining the Stand

Stands of alfalfa are best maintained under grazing when stresses from insects, diseases, and weeds are minimized. In general, practices that result in long-lived stands under hay management will have the same result under grazing. While grazing returns significant amounts of plant nutrients to the soil, it is important to continue soil testing to determine fertility needs. Dung and urine spots are often concentrated where animals congregate, so nutrients returned in dung and urine are unevenly dispersed.

Choosing a Variety

Significant advances have been made in the development of alfalfa varieties that are more tolerant of grazing conditions. Alfalfa varieties selected under grazing pressure will better tolerate hoof traffic and allow more flexible grazing schedules than hay-types while maintaining thicker stands. The University of Kentucky has done several studies to document persistence and tolerance to abusive grazing in alfalfa varieties. The grazing tolerance trait provides a safety net or insurance against stand damage from overgrazing. Any variety for grazing should meet the same requirements for yield and disease resistance that would be expected in a hay variety.

Rotations (Graze-Rest)

Research has shown that rotational grazing is better than continuous grazing for yield, quality, and stand persistence.
General recommendations are to graze a paddock for one week and allow four to six weeks for plants to recover before grazing again. First growth grazing in spring is determined by weevil infestation, plant growth stand, and the need to establish the rotation to manage yield, quality, and plant persistence. Considerable flexibility exists in the grazing time, but plants should not be grazed for more than a week. If they are grazed for longer periods, new shoots developing from crown buds will likely be damaged. Stocking density should be heavy enough to remove growth in five to seven days or less.

**Number of Paddocks**

Dividing the alfalfa field into smaller paddocks is necessary for rotational grazing. You need enough paddocks to permit proper grazing management but few enough to meet individual management resources.

Begin with a minimum of five individual paddocks. Having this number allows you to rotate animals to a new paddock each week with a four-week recovery. During peak growth, you may need to cut one or more paddocks for hay or silage to maintain high-quality grazing in the rotation. In times of slow growth, you may need to further divide one or more paddocks to permit longer recovery periods.

**Stocking Rate**

Stocking rate is the number of animals grazing over an area during the grazing season. Stocking density is the number of animals grazing an area at a particular time. Past experience with productivity can give a good estimate of how many animals a given area will support (carrying capacity).

Alfalfa has the yield potential to support a high stocking rate. On good, productive stands, stocking rates of 1500 to 3000 pounds of animal liveweight per acre are generally suggested. Adjustments can be made based on stand productivity, animal needs, experience in grazing management, and risk levels a producer is willing to assume.

**Bloat Precautions**

No management practice can ensure that bloat will not occur. However, its likelihood can be greatly reduced when grazing alfalfa. The following suggestions can reduce the risk of cattle bloat:

- Grow grass with alfalfa.
- Provide grass hay or grain during the first week or two of grazing alfalfa.
- Feed Rumensin®.
• Feed bloat-preventing compounds,
• Do not turn hungry cattle into an alfalfa field, especially when plants are wet from dew.
• Do not graze immature alfalfa or alfalfa/grass.
• Provide salt and minerals.
• Observe cattle closely when turning in for the first time.
• Observe cattle closely during cool, cloudy, and rainy weather for signs of bloat.
• Do not graze alfalfa for three days following a killing frost (below 24°F). The harder the frost, the greater the risk for bloat during this brief period.

A Case Study

The following data came from a field trial which we conducted on 16 acres of alfalfa which was divided into 8 paddocks with a sacrifice area of fescue. Grazing began on May 1 with 52 steers averaging 626 lbs. The 32 heaviest calves were sold on July 17 and 15 calves were added on July 25. Two pounds of supplement (containing poloxalene, salt-minerals and corn) were fed daily. Overall gain was 732 lb/acre. Results indicated that grazing alfalfa could be a viable economic alternative to marketing alfalfa as a hay crop.

<table>
<thead>
<tr>
<th>Performance of Steers Grazing Alfalfa-1991</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERIOD</td>
</tr>
<tr>
<td>5/1 -6/4</td>
</tr>
<tr>
<td>6/4 – 6/17</td>
</tr>
<tr>
<td>6/17 – 7/17</td>
</tr>
<tr>
<td>7/18 – 8/27</td>
</tr>
<tr>
<td>8/28 – 10-1</td>
</tr>
<tr>
<td>7/25 – 8/27</td>
</tr>
<tr>
<td>Calves, no</td>
</tr>
<tr>
<td>Days</td>
</tr>
<tr>
<td>Gain/hd, lb</td>
</tr>
<tr>
<td>ADG, lb</td>
</tr>
<tr>
<td>Gain/acre, lb</td>
</tr>
</tbody>
</table>

(Overall 732.4 lb/acre)
WHY AREN’T BIG SQUARE BALERS USED MORE IN KENTUCKY

Tom Keene
Extension Hay Marketing Specialist
University of Kentucky
Lexington, KY

The history of making hay dates back for centuries and centuries. When mankind began to grow crops and livestock rather than being nomadic, they had to have some type of forage to feed their livestock during the cold and winter months. Since that time there has been a slow and steady progression from harvesting material by hand to today’s modern hay making equipment that maximizes time, labor, fuel, etc. However some countries to this day still use the methods that are thousands of years old when it comes to hay making.

Not only did farmers need hay for the winter months they also needed for traveling with their livestock. Whether it was across and ocean or across a continent, hay was a necessary commodity to bring with you when you were traveling any distance whatsoever. For instance, when building the transcontinental railroad, where the horses would haul the rails and the cross ties ahead of the track being laid, they needed hay especially when they were in the desert and mountains. In the book, “Nothing in the World Like It”, author Stephen Ambrose cites hay costing $120.00 a ton in the mid-to late 1860’s.

Soon after that hay nuking equipment began to be manufactured by individuals like Cyrus McCormick and then commercially by companies like International Harvester. From there we have never looked back when it comes to advancing and modernizing our haymaking equipment. From sickle bar mowers to stationery balers to self-propelled bale stackers to today’s modern big balers, mechanization of hay making equipment has evolved dramatically.

We now have multiple baling and storing options for making high quality hay. We still have small square bales but the vast majority of hay nowadays is put up in big packages whether they be round bales (various size bales, mid-size square bales (3*3*8 or 3*4*8) or large square bales (4*4*8). Other packing options include baleage, pellets, cubes and loafs.

While those different type packages can be found nationwide, some areas of the country have more of one version of type of bales than other parts of the country. East
of the Mississippi river, round bales and small square bales are most prevalent. West of
the Mississippi, big square bales are found in greater numbers.

In Kentucky, while any of those bales will get the job done, moisture is our sworn
enemy when it comes to making high quality hay. Our high humidity levels here in the
Ohio Valley make it very difficult to consistently bale hay at moisture levels in the 10 to
18% moisture range. The larger the bale the further the moisture has to travel from the
center of the bale to escape during the curing process.

While size of bale is one concern, there are others that influence bale density;
baler settings, tightness of wrapping of round bales, some forages are denser than
others, plant maturity as well as what forage species is being put into the bale. An
example might be that alfalfa in the bale is denser than orchardgrass, while
orchardgrass would be denser than wheat straw.

The following chart shows different bale densities and how that can affect bale
weight in a 5 * 5 round bale.

<table>
<thead>
<tr>
<th>Bale Width, ft</th>
<th>Bale Diameter, ft</th>
<th>Bale Density lb/ft³</th>
<th>Bale Weight, lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5</td>
<td>9.53</td>
<td>935</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>10.09</td>
<td>990</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>10.65</td>
<td>1,045</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>11.21</td>
<td>1,100</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>11.77</td>
<td>1,155</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>12.33</td>
<td>1,210</td>
</tr>
</tbody>
</table>

*Texas A&M, Texas AgLife Extension
Kentucky grain farmers have experienced several successful years seeing high prices and good yields, with the exception of the drought in 2012. If you were insured in 2012, which most lenders required, you probably also came out with a profit during that challenging time. Alfalfa producers in Kentucky have also seen high prices and decent yields. While the drought of 2012 affected them, most still harvested an 80% crop with extremely high prices and demand. The fact that alfalfa is a deep rooted plant, coupled with timely rains proved beneficial to this group. Alfalfa is the third most valuable crop across the US. Even with this success, the current crop insurance program is very antiquated and need to be updated. The number of farmers that sign up for alfalfa forage insurance is surprisingly less that 10%.

The National Alfalfa and Forage Alliance was formed in 2006 to promote alfalfa and forages. This alliance has worked closely with AFGC, of which KFGC is also a member. Ray Smith and myself are liaison members from AFGC, and also serve on the board for NAFA. In February, NAFA will host a trip to Washington D.C., with the purpose of heightening the awareness of the nation’s third most valuable crop. Efforts are focused on enhancing research funding, and networking with congressional offices and regulators as they set agricultural, conservation, and renewable fuel polices. Initiatives addressed:

ARS funding & projects
Bioenergy
Biotechnology
Crop Protection Farm Bill NIFA Funding
Risk Management – Alfalfa Crop Insurance

The Alfalfa Forage Research Program just received 1.35 million in Research Funding for 2014. Senator Jerry Moran of Kansas was very helpful in this success.

NAFA was also instrumental in keeping crop payments from being coupled to only the crop planted. Had this not been addressed, bankers would not have been eager to loan money on non program crops.
Alfalfa genetics will also be promoted heavily with the upcoming stacked Roundup Ready and Low Lignin from Forage Genetics. Dow has made a significant investment in Alfalfa Research with the acquisition of CalWest/Producers Choice which will compliment Dairyland Seed. These programs have the resources to put out some value added products.

Seed coatings and seed treatments are also becoming prominent and companies are now selling specific coatings for certain agronomic regions. We see this as the largest growing market, and the major companies are consistently looking at seed treatment and additives in the early screening process.

Alfalfa is being promoted as it never has in the past, and with new technology it looks to a bright and successful future.
ADJUSTMENTS AND MAINTENANCE OF HAYING EQUIPMENT

Clayton Geralds, Geralds Farms, Hart Co., KY
John McCoy, McCoy Simmenttal Farms, Warren Co., KY
Cris Scudder, Ag. Instructor, Western KY University

Clayton Geralds runs a commercial hay farm in Hart County near Munfordville, Kentucky. His total farm size is 740 acres, 430 of which are leased. The focus of his operation is producing small square bales for the horse market. Clayton currently grows a range of forage species including 560 acres of alfalfa and alfalfa/orchard grass and 160 acres of timothy and orchard grass. On average he puts up 100,000 small square bales a year. In his presentation Clayton will discuss the importance of proper adjustment of harvesting equipment as well as maintenance of that equipment. In 2009, Clayton, along with his son Christopher, received the KFGC Grassroots Producer award. In September 2013 he was elected to serve on the National Hay Association’s Board of Directors.

NOTES
John McCoy is owner and manager of McCoy Simmental Farms in Bowling Green, KY. McCoy has a deep rooted history in agriculture. He has been farming since the age of 5 years old and is now known for premium alfalfa and quality registered Simmental cattle. He runs a herd of 115 registered Simmental cattle and raises 96 acres of alfalfa. He planted his first alfalfa field in 1964 and is the go to person for high quality alfalfa for many horse, sheep, goat and alpacas farmers. In October 2013, he was the recipient of the 2013 KFGC Grassroots Producer award which was given at the 14th Kentucky Grazing Conference.
Cris Scudder is an Instructor in the Department of Agriculture at Western Kentucky University in Bowling Green, KY.

<table>
<thead>
<tr>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Mark your calendars for

Thursday, February 26, 2015

for the

35th Kentucky Alfalfa Conference

to be held at the

Cave City Convention Center