

# ***Spring Ranchers Forum Proceedings***

a program by the

***Central Florida Livestock  
Agents' Group***

***Thursday, March 25, 2010***

***Yarborough Ranch***

***1355 Snow Hill Rd.  
Geneva, Florida***



# **SPRING RANCHERS FORUM**

## **MARCH 25, 2010**

### **PROCEEDINGS**

**Central Florida Livestock Agents Group**

**Agents**

Randy Bateman (Osceola)  
Sharon Fox-Gamble (Volusia)  
Ed Jennings (Pasco / Multi-County Livestock)  
Dennis Mudge (Orange/Seminole)  
Martha Thomas (Lake)  
Mark Shuffit (Marion)  
Joe Walter (Brevard)  
Mark Warren (Flagler)

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# **SPRING RANCHERS FORUM**

**A program by the  
Central Florida Livestock Agents Group**

**THURSDAY, MAY 25, 2010  
YARBOROUGH RANCH  
1355 Snow Hill Road, Geneva**

## **AGENDA**

**8:30 am - Arrival - Meet with Allied Exhibitors**

**9:00 am** - Hosts: Dennis Mudge, CFLAG, IFAS Extension Agent, Orange & Seminole County; Imogene Yarborough, Yarborough Ranches;  
Welcome by Lynn Hanshew.

**9:15 am - “Mole Cricket Control”** - Dr. Norman Leppla, University of Florida IFAS, Insect Pest Management, Entomology and Nematology

**10:00 am - “Emerging Trends in Parasite Management”** - Sharon Fox-Gamble, Livestock Extension Agent, Volusia County, CFLAG, University of Florida/IFAS

**10:45 am - Trade Show Break**

**11:00 am - “Seeded Bermudagrasses for Florida”** - Dr. Yoana Newman, University of Florida IFAS, Forage Extension, Agronomy

**11:45 am - Give-Aways**

**12:00 pm - Steak Luncheon** - Yarborough Family - Invocation - Al Johnson.

**12:30 pm - Give-Aways**

**12:50 pm - “Saving Your Grass: Grazing Management Strategies for Horse Pastures”**  
- Mark Shuffitt, Livestock Extension Agent, Marion County, CFLAG, University of Florida/IFAS

**1:10 pm - “Phosphorus Removal with Sod Harvest”** - Joe Walter, Livestock Extension Agent, Brevard County, CFLAG, University of Florida/IFAS

**1:30 pm - “How Can You AFFORD Not to Fertilize”** - Martha Thomas, Livestock Extension Agent, Lake County, CFLAG, University of Florida/IFAS

**1:50 pm - “Toxic Plants: Recent Farm Animal Poisonings”** - Dennis Mudge, Livestock Extension Agent, Orange & Seminole County, University of Florida/IFAS

**2:10 pm - “Dry Matter Supplementation”** - Mark Warren, Livestock Extension Agent, Flagler County, CFLAG, University of Florida/IFAS

**2:30 pm - Survey & Closing**



**A 30-Year Effort to Deploy the Mole Cricket Nematode and Wasp  
2010 Spring Pasture Forum**

**Norm Leppla, Howard Frank, Ed Jennings and Randy Bateman  
University of Florida, IFAS Cooperative Extension**

**Al Clarke  
Becker Underwood**

For many years the research committee of the Florida Cattlemen's Association has listed research on mole crickets as its most important concern. In the 1980s, biological control research resulted in the introduction and establishment of a beneficial nematode and wasp. These beneficial organisms are effective in controlling mole crickets and can be adopted widely by ranchers. An Extension education program and associated action is providing the necessary assistance for this adoption.

The mole cricket Extension Action Team composed of researchers, Extension agents and cattlemen have determined the best methods for applying the nematodes and most useful plants for attracting and maintaining the wasps. This information has been communicated to Florida cattlemen by UF/IFAS Cooperative Extension Agents but the per acre cost of materials is as much as the cattlemen can afford, leaving no means of paying for nematode applications and establishing the wasps.

To bridge the gap between developing these biological controls and making them available to Florida cattlemen, we have secured grants from the Southern Region IPM Center and UF/IFAS Extension. These funds have been used to purchase two swept-back chisel rigs with trailers for transport, develop an Extension education program to train cattlemen in how to use the equipment, and make the equipment available to them on loan. The plan is to:

- 1) To develop an Extension education program and demonstrate to Florida ranchers the use of a beneficial nematode and wasp to control pest mole crickets in their pastures. It will instruct in how to identify damage caused by mole crickets, apply the nematodes, distribute the wasps, and determine if the nematodes and wasps have established.
- 2) To make the nematode application equipment available on loan during and far beyond the limits of the project.
- 3) To assist cattlemen in installing the specified wildflowers as nectar sources for the wasp.
- 4) To help spread the nematode and wasp to all areas where mole crickets are still a problem in Florida, so as to provide a permanent solution.

## A 30-Year Effort to Deploy the Mole Cricket Nematode and Wasp

2010 Spring Pasture Forum

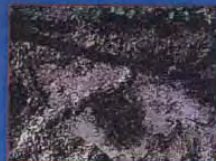
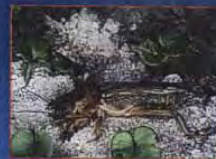
Norm Leppla, Howard Frank, Ed Jennings, Randy Baleman &



Al Clarke



## Mole Cricket & Damage



## Chemical Control



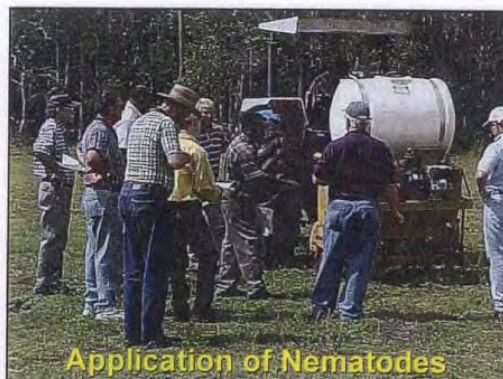
- Mole cricket damage and chemical control cost ~ \$100 million annually in the S.E. United States.
- Chemicals are too expensive for use on pasture land.
- Mole crickets rebound in most treated areas.
- Concern about non-target effects of chemicals.

## Mole Cricket State Program

Objective: To conduct research and Extension demonstration projects that will widely distribute the mole cricket nematode and wasp in Florida, determine their establishment and impact on pest mole crickets, and support commercialization of the nematode.

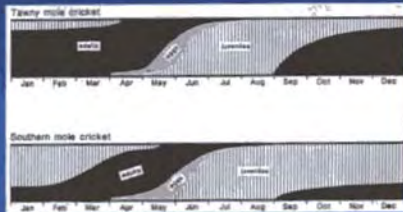


## In vitro Nematode Production

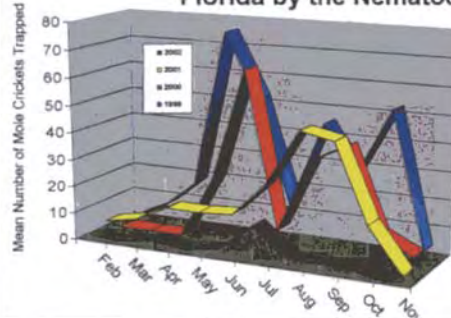


Application of Nematodes

## Seasonal Distribution of Mole Cricket Stages

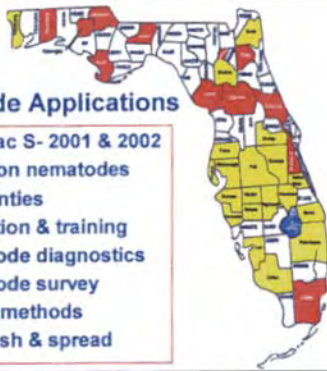


## Biological Control of Mole Crickets in Florida by the Nematode



## Nematode Applications

- Nematac S- 2001 & 2002
- 80 billion nematodes
- 32 counties
- Education & training
- Nematode diagnostics
- Nematode survey
- Refine methods
- Establish & spread

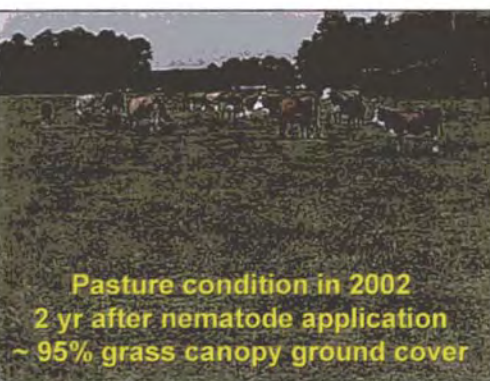


## Pasture Evaluations



## Mole Cricket Nematode in Florida

- 6 months- 80% mole crickets infected
- 1 year- infected mole crickets spread nematodes across the pasture
- 3 years-
  - 85% decline in mole crickets
  - 40-95% recovery of bahiagrass
  - 20-35% infected mole crickets



**Pasture condition in 2002**  
**2 yr after nematode application**  
**~ 95% grass canopy ground cover**





## Suppliers of Nematac S

### Pasture and Soil Larvae

- Helena Chemical
- ProSource One
- Diamond R Fertilizer
- Griffin Fertilizer
- Triangle Chemical
- Growers Fertilizer



## Survey: Do You Need Mole Cricket Nematodes?

- Do you have significant mole cricket problems in your pasture? **Yes**
- Would you use Nematac S with technical assistance from Becker Underwood and UF/IFAS? **Yes**
- Are you willing to pay up to \$50 per acre for both the product and application? **No**
- Would you prefer to pay \$25 per acre and borrow the application equipment? **Yes**

## Actions to Increase Deployment of Nematac S

- Provide application equipment and assistance in applying the nematodes
- Keep the cost to \$25 - \$50 per acre
- Conduct field demonstrations to assure that the nematodes are used effectively



## How to Add Larra Wasps to Control Pest Mole Crickets

- Plant shrubby false buttonwood, *Spermacoce verticillata*



*Larra bicolor* on a spermacoce flower



Larra attacking a mole cricket






**McCricket**

<http://entomology.ifas.ufl.edu/fasulo/molecrickets/>



<http://ipm.ifas.ufl.edu>



# **INTERNAL PARASITE MANAGEMENT – A NEW WAY OF THINKING FOR CATTLE, HORSE, SHEEP AND GOAT OWNER/PRODUCERS**

Gamble, S. F., UF/IFAS Extension Agent, IV

Parasites exist in livestock and are normal to the animal. Anyone that has had animals for any length of time sooner or later has had to contend with the control or management of parasites. Heavy parasite infections can kill animals while lesser infections can reduce profits due to decreased efficiency of production. This paper will focus on gastro-intestinal nematodes (GIN).

Only a few years ago, recommendations for control were based on the premise that anthelmintics should be used in a strategic manner to maximize animal productivity. This approach was used because it was known that sub-clinical parasitic infections are responsible for significant economic loss once clinical disease was noticed in a group of animals. Much economic loss in terms of animal productivity had already occurred in some animals. Dr. L. Gasbarre demonstrated in a trial in 2004 that control of sub-clinical parasites returned \$50 per head treated. Parasite control was therefore aimed at preventing animals from becoming highly parasitized, thereby maximizing productivity. Keys to the success of this theory were the availability of inexpensive and effective anthelmintics. The drugs were cheap, easy to use and readily available. Unfortunately, locally, in the Southeast United States and worldwide, we have learned this approach was short-sighted and unsustainable. Parasites have developed resistance to individual drugs, classes of drugs and multiple classes of drugs. Research indicates that the resistance problem is occurring in sheep, goats, horses and cattle. The problem is very real in the Southeastern United States as warm humid climates are the number one environmental factor that encourages parasite reproduction. In fact, they have adapted to conditions that best favor forage production. So if forage is growing, you can bet parasites are being transmitted.

Parasites are very simple in all their biological systems except one and that is their ability to reproduce at a high rate and they have an extraordinary ability to remain on pastures.

Parasites have had millions of years to co-evolve with their hosts. They have taken advantage of that time to ensure that they can reproduce at high levels. Parasite infestations are quantitative. Unlike the flu, once you have the disease then you have a problem, for them it is all about the numbers, the numbers of parasites that are infecting the host. A producer needs to ask, how many larvae are available to the host. It is important for the producer to understand the parasite life cycle, in efforts to modify animal infection.

## **Effects of GIN**

The single most effect of GIN is the suppression of appetite. This is in part an interaction with the animal's immune system by stimulating appetite suppressing cytokines. Another response by the immune system is making the intestine a poor place to live. Mammalian response is to get rid of anything foreign to it. You get rid of things in the gastrointestinal tract most effectively by forcing them out, therefore, the body masses explosive diarrhea because parasites are poor swimmers upstream. The body tries to flush them out and stimulates increased mucous production. Unfortunately, while the immune system is trying to rid the body of parasites; it also has created conditions not conducive to absorbing nutrients. GIN are stimulators of the immune system and because the immune system is a finite body, it can only handle so many things at a time. The immune system is highly regulated therefore you will see loss of certain aspects of the immune response in animals that are heavily to moderately parasitized.

## **Historical Perspective**

Historically we controlled parasite infection rates by either modifying how many eggs were shed in the feces or by altering the time interval between fecal egg shedding and animal ingestion. Prior to the 1970's, most of the effort was aimed at modification of pastures and parasite survival. Over the past 40 years, producers have enjoyed the simplicity of using basically cheap, easy to use and relatively safe products with repeated dosing if necessary to kill GIN. Additionally, producers/owners have also developed an attitude that any parasite level is bad and therefore all parasites should be eradicated from the animals. Leading parasitologists have warned that wide-spread eradication of gastro-intestinal parasites is not feasible, nor advisable. Producers/owners need to re-think their approach to parasite infection rates, treatment methods and management practices as there are no new classes of parasite control products coming from the "research pipeline" for animal use. In short, the products that we have are the products we are going to have and once the GIN develop resistance; we will have nothing with which to provide effective treatment. Our traditional management over the past 40 years has enabled the strongest, most resistant parasites to survive and reproduce with great abandon. We are in a new era and we must adapt our management if we are to keep up with these rudimentary nematodes. So, throw out the traditional management and the thought "this is the way daddy did it."

If you haven't been following the literature lately, the concepts you are about to be exposed to "fly" in the face of our thinking. For many of you, it will be all but impossible to let go of the concepts of "one dose" treats all, rotate products, treat everyone in the herd, flock or barn and treat based on the calendar. Not to mention that we actually want to have a "resident" parasite infection rate.

To understand where we are and where we must go, it is important first to understand how we got into this situation to begin with. When anthelmintics first became readily available, we used them. We knew for whatever reason that we didn't always kill off all the parasites. Research indicated that not all products killed the parasites at all stages of life cycle development so when we treated, we might kill the adult but not the stages leading up to adulthood. We also knew that sometimes not all the adults were killed for whatever reason. So over a period of time the surviving GIN were un-phased by the product being used. As we targeted specific parasites, we increased the selection pressure, those remaining parasites genetically developed super-resistance. Basically, its immune system ward off the product yielding it ineffective.

The resident pool of GIN are termed "refugia." Refugia are the GIN that remain in the animal and they will play a major role in how we address GIN in the future. To further the resistance issue, producers/owners rotated products. All this did was to enable the development of resistance to a wider array of products. Research on a 4,000 head stocker operation in Southeastern U.S. showed cattle (2004) had resistance by *Ostertagia* and *Cooperia* to some products. Research on 44 equine farms with 1274 horses across 5 states indicated that 40% of equine farms had resistance in the small strongyle population. In 2001 Dr. Kaplan reported that 90% of goat/sheep farms in Georgia had multiple drug resistance to drug classes in the U.S. By the close of 2001 an additional 30% of those farms had resistance to yet a third drug class.

Research has also shown that not all animals in the herd have equal susceptibility or resistance to parasites. Younger animals are more susceptible but as animals age, they develop a natural level of resistance to low levels. Research has shown that 20% of animal shed 80% of the parasites while the other 80% of the animals in a herd shed very few. And many parasite life cycles favor conditions for warm, humid conditions and when birthing occurs. Culling criteria may include resistance factors as further genome typing occurs across species.

## **Refugia**

Several leading parasitologists believe the current answer lies in the refugia. Refugia are the resident parasites in the herd. If refugia populations reside in the 80% of animals that are tolerant of parasites

they then harbor the genetic gene pool to “dilute” the genetics of the resistant parasites. When the parasites mate, they mate with GIN of less tolerance to current anthelmintics.

The concept is simple. Evaluate animals individually and only treat those that are moderately to heavily parasitized. Additionally only treat those animals with suitable anthelmintics. Do not rotate to another product until it is known that one is no longer effective on the current parasite gene pool.

Pasture management can go a long way in preventing resistance by minimizing the dependence on anthelmintics. Parasite larvae crawl up grass blades about 1 – 2 inches. Therefore animals that are not forced to graze forage close to the ground will ingest fewer larvae. A common practice has been to treat a herd with anthelmintics and then move the herd to a “clean” pasture. This is no longer a good practice. All that we are accomplishing is spreading “super resistant” worms to a clean field, while taking the genetically more susceptible worms out of the gene pool.

So how does one determine which animals need to be treated? In sheep and goats, the FAMACHA method can be utilized. FAMACHA is nothing more than comparing the pink eye tissues to a color chart that rates parasite loads on a scale of 1 – 5. Further information regarding FAMACHA and ordering charts can be found on the Southern Consortium for Small Ruminant Parasite Control website: <http://www.scsrpc.org/SCSRPC/FAMACHA/famacha.htm> Producers are cautioned not to rely solely on this technique. Integrated approaches must be used to control GIN.

### **Fecal Egg Counts**

Another method is to have fecal egg counts (FEC) conducted. While it is best to collect samples directly from the rectum, floor samples can be utilized. FEC can be used to determine which animals in a herd are the chronic shedders and which are not. Also from this data, test can be performed to determine which products are and are no longer effective in the GIN gene pool for a particular herd. For further information regarding FEC collection and submission, please refer to the attachment at the end of this paper under the heading of FECAL EGG COUNT DETERMINATION. FEC are conducted before treatment of animals with an anthelmintic and then tested once again about 10 days later. There should be at least an 85% kill or reduction of eggs.

Given the sampling program, four things will influence the value you get from a sample: the year you took it, the individual animal you took it from, the day you sampled and the error that is inherent in the assay. In a study by Gasbarre, 7,200 samples were collected from 800 animals. The research showed that the year didn’t make much difference. The day you sampled had little influence. The highest source of variation was between different animals (56%) and sampling error accounted for 36%. It is important to do as much as possible to account for and minimize this error.

While spreading manure redistributes nutrients, it also distributes parasite larva throughout the pasture. Horse and cattle instinctively will not graze immediately around their manure piles, where larvae have been deposited. Larvae do not travel more than 12” from a manure pile. In Florida, most of the parasite transmissions occur in the fall and winter months. The intense spring and summer solar radiation will kill many larvae. Therefore, a new approach may be to stockpile/compost manure during the winter and spread manure during the summer months where solar radiation can kill any of the larvae, not killed by composting.

To implement any type of integrated parasite control program it is essential to know when loads will be highest, such as at lambing/kidding/calving/foaling. Where the young animals will stay at those high egg producing times and how pastures can be divided and rested in order to have eggs and larvae die. Often a 21 - 30 days pasture rest period is utilized to permit adequate forage re-growth, unfortunately that is not



generally long enough for many parasite cycles. Therefore managing forage height is increasing important to minimize egg/larval ingestion.

### **Alternative Dewormers**

Most alternative dewormers have not been shown by scientific research to have any effect on the numbers of worms. Diatomaceous earth (DE) has popularity by some for controlling internal and external parasites. In many cases, DE is utilized in cases where producers also practice very good management. Additionally in many cases, the producers have very “clean” animals due to their management and do not have a significant parasite load to begin with.

### **Conditions with Signs Similar to Parasitism**

Often, it is easy to assume animals are wormy if they are unthrifty, thin, have rough hair coats and the presence of diarrhea. However, it should be pointed out that stress brought about by weather extremes can cause sub-clinical parasitism to become extreme. Lack of good body condition into the winter will cause additional stress resulting in blood loss and death as compared to an animal on a higher plane of nutrition. It is the animal's lack of nutrition that causes the disease, GIN are the symptom.

### **Conclusion**

Gastrointestinal worm control techniques will have to be integrated in order to reduce dependence on chemical deworming products. Parasite resistance has been well documented in the Southeast United States, throughout the United States and worldwide. The genetic adaptation by gastrointestinal parasites is making many products and family of products ineffective. What may work on one farm may not at another location.

Owner/producers will need to accept a certain level of parasites in their animals as normal and beneficial. These parasites will serve to dilute the resistant strains via mating to extend the effectiveness of the current anthelmintics on the market as the future of additional products becoming available is dim.

Pasture management will play an increased role in parasite control methods by reducing egg shedding and larval ingestion. Fecal egg counts will be used increasingly to determine infestation levels and product efficacy.

No one single method will be effective in managing parasite populations in the future. Producers will have to “re-think” their management strategies.

### **References**

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## FECAL EGG COUNT DETERMINATION

February 19, 2010

The research lab of Dr. Ray M. Kaplan offers laboratory services to veterinary practices as well as farmers and producers (institutions and researchers should contact the lab for the research service and price list) to aid in the management of livestock parasites. This document serves as a list of available services as well as the price and a brief description of each service provided by the Kaplan Lab. The instruction sheet and sample submission form is attached. Services can be arranged by contacting the lab at (706) 542-0742.

### 1. Fecal Egg Counts:

- a. 2 or 4 gram modified McMaster method - \$12.00 per sample
- b. High sensitivity McMaster (8 epg sensitivity) - \$15.00 per sample
- c. Wisconsin or Stoll method - \$20.00 per sample

2. Coproculture and Larval Identification (fecal culture for - \$100.00 per culture speciation of parasites present) - \$75.00 each when multiple samples submitted.

3. DrenchRite Larval Development Assay\* - \$450.00 per assay  
a. Processing fee for un-testable sample - \$50.00

4. PCV & TS (hematocrit and total protein) - \$15.00 per sample

5. Blood smear examination (*M. haemolamæ*) - \$20.00 per slide

6. Fecal Sedimentation (test for liver fluke) - \$20.00 per sample

7. Lectin Staining (quantifying relative percent of *H. contortus* in a given sample) - \$40.00 per sample

\* Performance of this test requires pre-arrangement with lab prior to collection and submission of sample.

Ray M. Kaplan, DVM, PhD, DipEVPC

Professor of Parasitology

PLEASE READ THE COLLECTION/ SUBMISSION PROTOCOL BEFORE  
COLLECTION TO ENSURE PROPER SAMPLE SUBMISSION.

PLEASE CONTACT THE LABORATORY TO ENSURE LAB PERSONNEL  
ARE AWARE SAMPLES ARE BEING SUBMITTED. (706) 542-0742

Sue Howell or Bob Storey, Dept. of Infectious Disease, College of Veterinary Medicine  
501 D.W. Brooks Dr., University of Georgia, Athens, GA 30602

DIRECTIONS FOR FECAL SAMPLE SUBMISSION FOR FECAL EGG COUNT (FEC),  
COPROCULTURES AND LECTIN STAINING:

It is best to collect samples directly from the rectum, however, feces can be collected off the ground if the animals are first put into a shed with a clean floor (free of bedding, grass and dirt). Feces are easily



collected from the rectum of mature animals using a latex glove with a little OB lubricant or KY jelly. The size of the sample that is needed to perform the test depends upon the tests requested per animal (several pellets (FEC) to a golf ball or lemon size clump for coproculture or lectin stain). We can always dispose of extra feces – better to include too much than too little.

On the day of collection, it is critical that feces be kept cool to prevent hatching of eggs, but care must be taken not to get the samples too cold because this will inhibit hatching. At the time of collection, feces should be placed in a cooler containing ice packs to keep the sample cool and can be placed in the refrigerator overnight. However, if requesting the coproculture, feces should not be kept refrigerated more than 48 hours as prolonged chilling will inhibit hatching of eggs making it impossible to perform the coproculture. We have also found that samples in direct contact with ice packs for 24 hours often do not hatch well. Therefore, if kept cool with ice packs, place something like newspaper, cardboard, etc, over the ice pack to prevent the samples from touching the ice packs. Because of the problem with cold-inhibition, fecal collections should be shipped the same or the next day. If feces are to be shipped to the lab, it is important that air be excluded from the feces as much as possible to prevent the development of nematode eggs prior to their isolation and testing (see below).

#### SAMPLE PREPARATION (for shipping):

We currently recommend two different methods for packaging samples for fecal egg counts, coprocultures and lectin staining (see below). Samples can be sent by priority mail, so long as they arrive in our lab within 3 days of collection. Samples should not be exposed to extreme temperatures (i.e. do not freeze or leave in the sun). Refrigeration is not needed and is not desirable after samples are processed to exclude air. If the samples will be hand-delivered to the lab within 48 hours, then they can be kept cool and do not need “air-exclusion processing”.

1. Utilize the “Reynolds Handi-Vac” system which utilizes a small handheld vacuum pump and special zip lock type bags for vacuum sealing. The Reynolds Handi-Vac kit is available at most grocery stores and at Walmart for around \$10.00. The sample is placed in the Reynolds Handi-Vac bag and sealed. The Handi-Vac pump is used to evacuate all of the air out of the bag, providing an anaerobic environment that will delay the hatching of the nematode eggs until they arrive at our lab. Place a piece of tape over the vacuum seal to keep the bag air tight. Label the bag with the species (sheep, goat, llama, etc), farm name, and date of collection.

2. Samples may also be placed in individual baggies. Compress the pellets together and exclude the air as much as possible before sealing the ziplock on the baggie. Label the bag with the species (sheep, goat, llama, etc), farm name, and date of collection. Ship by overnight or priority express\*.

\* If using the US Postal Service for the overnight delivery, be sure to check ahead of time to make sure they deliver to Athens, GA. With FedEx or UPS there should not be any problems.

#### INFORMATION TO BE INCLUDED WITH SAMPLE: (Submission form attached).

1. Owner name and contact information (including email and fax if available)
2. Name and contact information of veterinarian
3. Species and breed of animals
4. Number of animals feces were collected from, and manner of collection (from rectum or ground)

5. Date of last deworming and drug used

A check must be submitted with the sample. Samples received without payment may be discarded unless prior arrangements have been made. (This policy was required because we have had instances where payment was never received for the services provided despite repeated attempts to collect).

FOR MORE INFORMATION CONTACT:

Ms. Sue Howell or Mr. Bob Storey (in lab of Ray M. Kaplan, DVM, PhD)  
Department of Infectious Diseases  
College of Veterinary Medicine  
University of Georgia  
Athens, GA 30602  
voice: (706) 542-0742  
fax: (706) 542-0059

e-mail: [jscb@uga.edu](mailto:jscb@uga.edu) or [bstorey@uga.edu](mailto:bstorey@uga.edu)

Please include Sue Howell or Bob Storey on the address when shipping the sample.

## **Kaplan Lab Clinical Submission Form**

Client Name:

Farm Name (if applicable):

Client Address:

City, State, Zip:

Home Phone Number:

Cell / Other Number:

Fax Number (if applicable):

E-mail Address:

Name of Veterinarian / Clinic:

Address:

City, State, Zip:

Phone Number:

Cell / Other Number:

Fax Number (if applicable):

E-mail Address:

TESTS REQUESTED:

NUMBER of SAMPLES:

DATE of COLLECTION:

Animal Species / Breed Submitted:

Last Deworming Date and Dewormer Used:

Manner Samples were Collected (from Ground or Rectum):



## Seeded Bermudagrasses

Yoana Newman, PhD, Forage Extension Specialist

Bermudagrass is a highly productive warm-season grass adapted to the humid southeastern US where mild winters and warm climate are prevalent. Hybrid bermudagrasses are one of the most important grasses in Florida for hay and pasture production yet the most productive varieties do not produce viable seed; they are sterile hybrids like 'Coastal' or 'Tifton 85' that must be planted by vegetative cuttings that requires specialized equipment.

Seeded bermudagrass varieties have a viable sexual seed. Although not as productive as some hybrids, they offer an alternative that is less expensive to establish and is not as labor intensive in seedbed preparation than the sprigged types fitting small to medium acreage producers. This publication presents an overview of seeded bermudagrasses and description of the different types currently under evaluation in Florida.

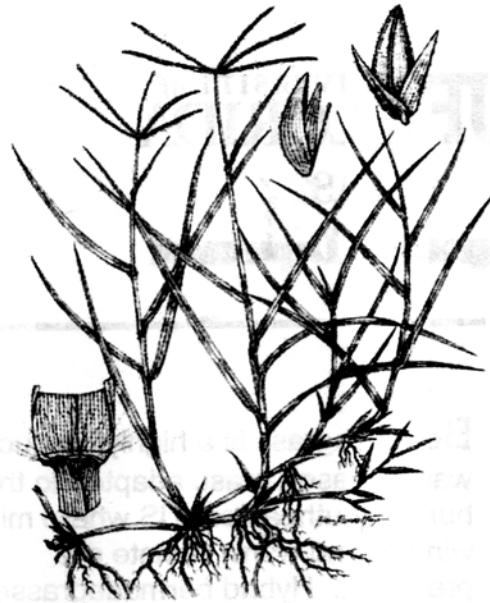


### **Description and Adaptation**

Seeded bermudagrass, known scientifically as *Cynodon dactylon*, is broadly distributed worldwide. It is called 'couch' grass in Australia, and 'quick' grass in India. It is also referred to as the 'worst weed' when growing in an undesired place! This grass is highly variable with small types that are only a few inches in height to tall growing types that can reach 18 to 22 inches. Seeded bermudagrass spreads by both seed and vegetative material (stolons or above ground stems, and rhizomes or below ground stems). The stolons or runners root readily at the nodes. Flower and seedhead production is highly variable, and seeds are very small.

In terms of adaptation, bermudagrass in general is a warm-season perennial with high light requirement and does not grow well under shady conditions. It is sensitive to freezing temperatures, but many of the seeded types have been selected for cold tolerance. Temperatures below 30°F kill the leaves and stems but growth will continue with night temperatures as low as 34°F if day temperatures are near 70°F. It is adapted to a wide range of soils but prefers sandy loams or sandy to clay soils that are well drained. The pH tolerance is broad (pH of 5.0 to 7.5). Although drought tolerant, it is adapted to areas of high moisture and rainfall.

They are most productive from May to September when average daily



**Fig. 1. Illustration of bermudagrass plant**

temperatures are above 75°F. Optimum daytime temperature is between 95 and 100°F. Soil temperatures of 65°F and above are necessary for growth of rhizomes/roots and stolons. Optimum soil temperature for root growth is around 80°F.

The seeded types used for pasture or hay production are selections of common types that offer a good alternative to hybrid bermudagrass because of their ease of establishment for the areas with small to medium acreage, or areas that present some physical barriers that make traditional seedbed preparation difficult. For example, they will fit better than hybrid types in cut under timber production or fields with a slope or other physical impediments where good seedbed preparation is not economical or possible.

## **Seeded Bermudagrass Varieties**

There are numerous seeded bermudagrasses available. Some are single types but most of the seed that is marketed are actually blends that contain improved selections of common and Giant bermudagrass. Many of the seeded types have been developed for cold tolerance in upper latitudes, and in turfgrass breeding programs, which have turned them to market for livestock production because of their high yields.

Currently, under evaluation in Florida are varieties: Cheyenne, Mohawk, and Wrangler, which are cold tolerant, and blends: Texas Tough, Sungrazer, Riata, and Stampede. A description of these types and some of the blend components follows.

**Common** is a bermudagrass type that is not improved, that is low-priced, and can produce a fair amount of forage with quality comparable to coastal.

**Giant (NK-37)** is a tall growing selection from a much taller and leafier 'common' from the Yuma, Arizona river valley (by Northrup King Co). Under high moisture climate, persistence has been observed to be 2 to 3 years, fact associated with fungal disease. It is used as a component of many blends, and as a single variety by many because it breaks dormancy 10 to 14 days earlier than most types in the market.

**Cheyenne** is a synthetic variety developed for vigorous growth habit and cold tolerance by Jacklin Seed Co and Pennington Seed; originally developed for turf and later used as a pasture.

**Mohawk** is a fine textured, cold tolerant variety named after the Mohawk Valley in Arizona, where the seed is produced. It is regarded as one of the most salt tolerant varieties on the market.

**Wrangler** is a variety released by Johnston seed Co., developed for cold tolerance that is comparable to the hybrid bermudagrass Tifton 44.

**Texas Tough** is a blend of 1/3 Giant and 2/3 common; marketed by East Texas Seed Company in Tyler, TX.

**Sungrazer** is a blend with tall growth selected for drought and cold tolerance. Marketed by MBS seed in Denton, TX.

**Riata** is a blend of Wrangler and Riviera, two bermudagrass varieties with improved tolerance to grazing and cold tolerance. Marketed by Johnston Seed Co.



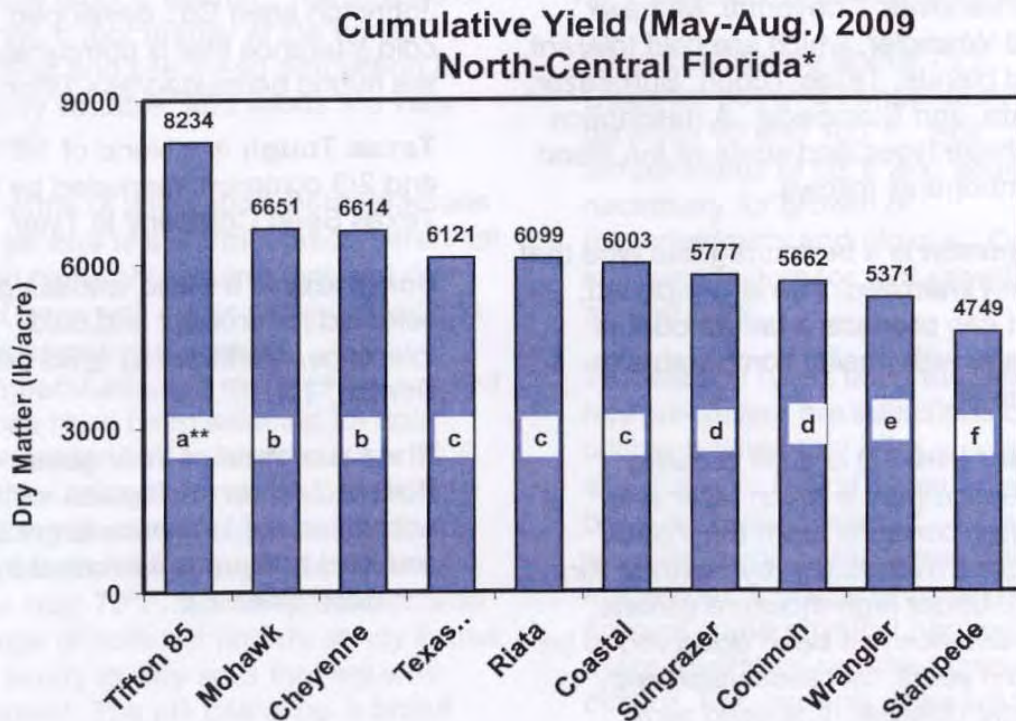
### Forage Quality and Production

Seeded types are usually high in nutritive value. However, as with most warm-season grasses, the quality will vary depending on management and variety. Usually, they present medium crude protein and medium digestibility.

Production of the seeded types in Florida is under evaluation but is expected to be variable with some of the varieties that have cold tolerance having more production

early in the year. However, in general, dry matter yield should be expected for many of them to be comparable to Coastal but lower than high yielding hybrid Tifton 85.

Result from the first year evaluation (Figure 1) corroborate findings from a long term study conducted in Texas (Table 1), where the hybrid Tifton 85 is highest yielding, and the production of the seeded types is similar to that of Coastal.



**Figure 1. Dry matter yield comparison of seeded bermudagrasses with hybrids Tifton 85 and Coastal during 2009 evaluation in Central Florida**

\* Seeding rate for seeded types 15 lb/acre; Date planted: June 10, 2008; number of harvests= 4 (May 26, June 23, July 17, August 18, 2009)

\*\*Yields followed by the same letters are not significantly different.



**Table 1. Comparison of Seed Bermudagrass with Hybrids (Tifton 85 and Coastal). A 5-year study conducted at Overton, Tx (Adapted from Evers and Parson, 2002)**

	1997	1998	1999	2000	2001	Average
	-----lb dry matter/acre-----					
<b>Tifton 85</b>	5044	8064	12915	12032	15680	10747
<b>Texas Tough</b>	2480	5262	11749	7956	10993	7688
<b>Coastal</b>	1611	3739	8507	9440	11549	6969
<b>Cheyenne</b>	2408	3430	6640	8928	13431	6967
<b>Common</b>	-----	-----	383	7445	11352	6393
<b>Wrangler</b>	-----	-----	0	7620	5539	4386



# Grazing Strategies for Horse Pastures

Lori K. Warren, PhD, Institute of Food and Agricultural Sciences, University of Florida

Many horse pastures in Florida, particularly small pastures, suffer from overgrazing. Repeated heavy grazing that removes too much leaf material weakens plant root structure making it difficult for plants to recover. As a result, less forage is available for grazing and pastures are vulnerable to weed invasion and erosion.

Horse owners have several options for managing the grazing of horses. Some grazing strategies are better at maintaining pasture ground cover and reducing the risk of overgrazing than others. Grazing strategies include:

- Continuous (season-long) grazing
- Partial-season grazing
- Limited turnout time
- Rotational grazing

## Continuous (or season-long) grazing

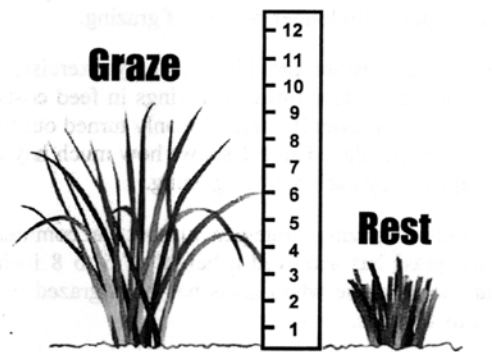
When horses have access to pasture 24 hours a day, 7 days a week, for the whole grazing season (or even 365 days a year), they are being managed under a *continuous (or season-long) grazing system*. Unfortunately, this grazing strategy often results in overgrazing, particularly on smaller acreages.

Continuous access to pasture allows horses to be very selective. Horses repeatedly graze the best-tasting plants, stressing them beyond their ability to survive. Plants are never given a rest or allowed to recover from grazing. Not surprisingly, under this type of grazing management, once-lush pastures are soon turned into dry lots where only weeds survive.

Unless large amounts of acreage are available, or pastures are irrigated, continuous grazing is not recommended for horse pastures in Florida.

## Two Essential Rules of Grazing Management

- 1) Avoid grazing until plants have reached an average height of 6 to 8 inches.
- 2) Remove horses and rest pastures when plants have been grazed down to 3 to 4 inches.



## Partial-season grazing

Restricting grazing to only part of the year, and then removing horses from pasture for the rest of the year, is referred to as *partial-season grazing*.

For example, some horse owners take advantage of the rapid plant growth in the spring and early summer, when forage quality is also at its highest, to graze their horses. When sufficient forage has been grazed, horses are moved off the pasture and hand-fed hay in a stall or small dry lot. Horses are not returned to the pasture until next spring.

By comparison, horse owners that spend their summer traveling to shows, rodeos and other events may choose to defer grazing over the spring and summer while they are gone. When their activities slow down in late summer and fall, they can turn their horses out to pasture to graze forage that has been stockpiled (saved back) over the summer.

Allowing access to pasture for only a portion of the grazing season reduces the risk of overgrazing as long as horses are denied access until the grass is ready (6 to 8 inches high) and removed from the pasture when sufficient grazing has taken place (3 to 4 inches high).

### Limited Turnout Time

Allowing horses daily access to pasture for shorter periods (½-hour to 12-hours per day) is referred to as *Limited Turnout Time*. This grazing strategy is ideal for horses managed on small properties, particularly operations that house more horses than their pastures can support with longer periods of grazing.

Turnout to pasture provides not only exercise, but may also provide significant savings in feed costs in the long-term, even if horses are only turned out for 1 – 2 hours per day. Table 1 shows how much hay can be replaced by each hour of grazing.

As with all grazing strategies, turnout can commence when grass has achieved a height of 6 to 8 inches, and should cease when grass has been grazed down to 3 to 4 inches.

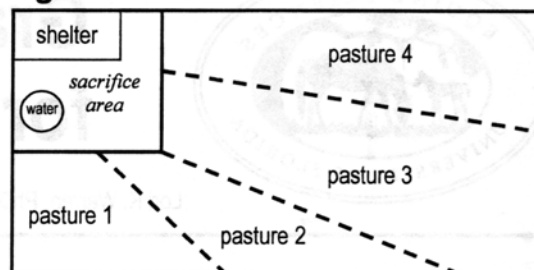
**Table 1:** Amount of hay that can be replaced per hour of grazing in spring or summer.

Season	Grass hay	Alfalfa hay
Spring	2.75 lbs	2.25 lbs
Summer	1.75 lbs	1.25 lbs

### Create and Use a Sacrifice Area

A "sacrifice area" is a dry lot, pen, corral, or stall run where horses can be housed and hand-fed whenever pastures need a rest from grazing. In essence, this area is "sacrificed" to spare your pasture from overgrazing and hoof damage at critical times.

**Figure 1**



### Rotational Grazing

Dividing a pasture into smaller "cells" and rotating the use of each cell is referred to as *Rotational Grazing* (Figure 1). Even small (1 – 2 acre) pastures can be effectively set up as a rotational system.

Using this grazing strategy, horses are allowed access to one cell at a time. When forage has been grazed down to 3 – 4 inches, horses can be rotated into the next cell. The previously grazed cell is then allowed to rest and recover. If sufficient regrowth occurs (6 – 8"), horses can be returned to a cell for more grazing. With sufficient moisture in the form of rain or irrigation, regrowth may take 15 to 30 days in the spring and early summer. In contrast, regrowth will take longer in the heat of the summer and into fall.

The size and number of cells can vary based on available acreage, the number of horses, the productivity of the pasture, and how long the horses will have residence in the cell. Ideally, each cell should contain enough forage to sustain the grazing horses for 4 to 7 days. Grazing for longer than 7 days may increase damage due to hoof tread, particularly near water and salt sources. Horse owners using rotational grazing for the first time will have to experiment with the size and number of their cells. Be flexible! Following a strict calendar of entrance and exit dates should be avoided. Instead, monitor the grazing progress and remove horses to another cell (or sacrifice area) when it's appropriate.

Confining horses to a smaller area of the pasture eliminates selective grazing, resulting in more complete utilization of the available forage. In addition, providing rest periods from grazing allows the grass to recover, which maintains desirable species and makes plants more competitive with weeds. Over time, the amount and quality of the forage growing in the pasture increases, which can potentially allow a greater number of horses to be supported by the same acreage. Rotational grazing can also improve the effectiveness of partial-season and Limited Turnout grazing systems.

## "Saving Your Grass"

### Grazing Management Strategies for Horse Pasture

2006

Florida Equine Institute

Mark Shuffitt

OVERGRAZED



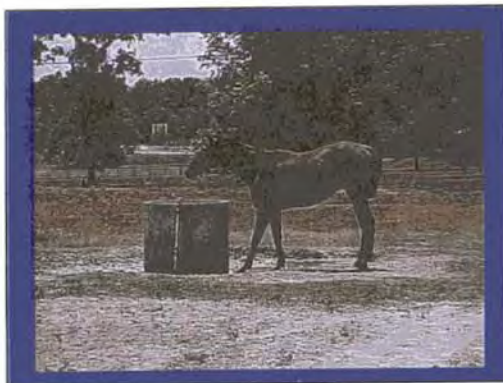
NOT  
OVERGRAZED



DRY LOT



## High Traffic Areas



## Problems

- Too Many Horses
- Not enough acreage
- Drought or Too much rain
- Too much shade
- Selective or Spot Grazing
- Lack of fertilization and/or liming
- Lack of mowing and maintenance

## Strategies

### Continuous Grazing

- 24/7 access to pasture
- All season long or All year long
- Selective or Spot Grazing
- Usually requires a significant amount of acreage
- Stocking rate is extremely critical



## Strategies

### Partial-season Grazing

Grazing pasture for only part of the year

- During times of rapid plant growth (spring & summer) then moved to Stall or Sacrifice Area
- Stockpile grass through the growing season (graze late summer - early fall)

## Strategies

### Partial-season Grazing

Reduces risk of overgrazing

IF Grazing Rules

Grass is 6 - 8" (bush hog height) before grazing  
AND

Horses are removed when grass is 3 - 4"

## Strategies

### Limited Turnout

- Allow access to pasture 1/2 to 12 hours a day
- Ideal for small acreage
- Follow grazing rules  
6 - 8 inches before grazing  
remove horses when grass is 3 - 4 inches
- Provides exercise and reduces feed cost

## Strategies

### Rotational Grazing

Divide pasture into sections

Rotate use of each section

Follow Grazing Rules

Grass is 6 - 8" (bush hog height) before grazing  
AND

Horses are removed when grass is 3 - 4"

## Rotational Grazing



## Strategies

### Rotational Grazing

- Each section should have enough forage for 4 - 7 days
- Allows for more complete use of forage (reduces spot grazing)
- Allow previously used sections to recover
- MONITOR progress and move horses to another section or sacrifice area as needed

### Rotational Grazing



### How Much Grass Do You Have?



# Phosphorus Removal in Harvested Sod in Central Florida

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Dr.

Maria Silveira, Asst. Professor, Dept. of Soil and Water Science, Range Cattle Research and Extension Center, Ona, FL

## ABSTRACT:

Ranchers in central Florida are facing increasing pressure from the public and regulatory agencies to reduce the use of nutrients, particularly Phosphorus (P) in their operations. Most of the regulations are aimed at reducing the amount of Phosphorus used in the production of agricultural crops. These regulations encourage or require the use of nutrient budgets to document and track the imports and exports of Phosphorus to agricultural lands. Regulatory agencies are also encouraging ranchers to increase the amount of phosphorus exports as agricultural products. In addition, some recent regulations require that Ranchers show that there is no net increase of Phosphorus if they apply certain soil amendments.

Nutrients budgets are relatively easy to create when hay or silage is harvested. However, it is difficult to create nutrient budgets when sod is harvested because of the lack of reliable estimates on the amount of phosphorus contained in harvested sod. Consequently, it is not possible to accurately estimate the amount of phosphorus removed when sod is harvested.

To address this issue the Florida Grazing Lands Conservation Coalition (FGLC) funded a project to determine the amount of phosphorus removed when sod is harvested. The goal of the project was to quantify the amount of phosphorus removed when different types of sod are harvested. The project investigated St. Augustine Grass (*Stenotaphrum secundatum*) and Bahiagrass (*Paspalum notatum*) sod harvested for use in landscape plantings and the revegetation of roadsides and other disturbed areas.

## PROJECT:

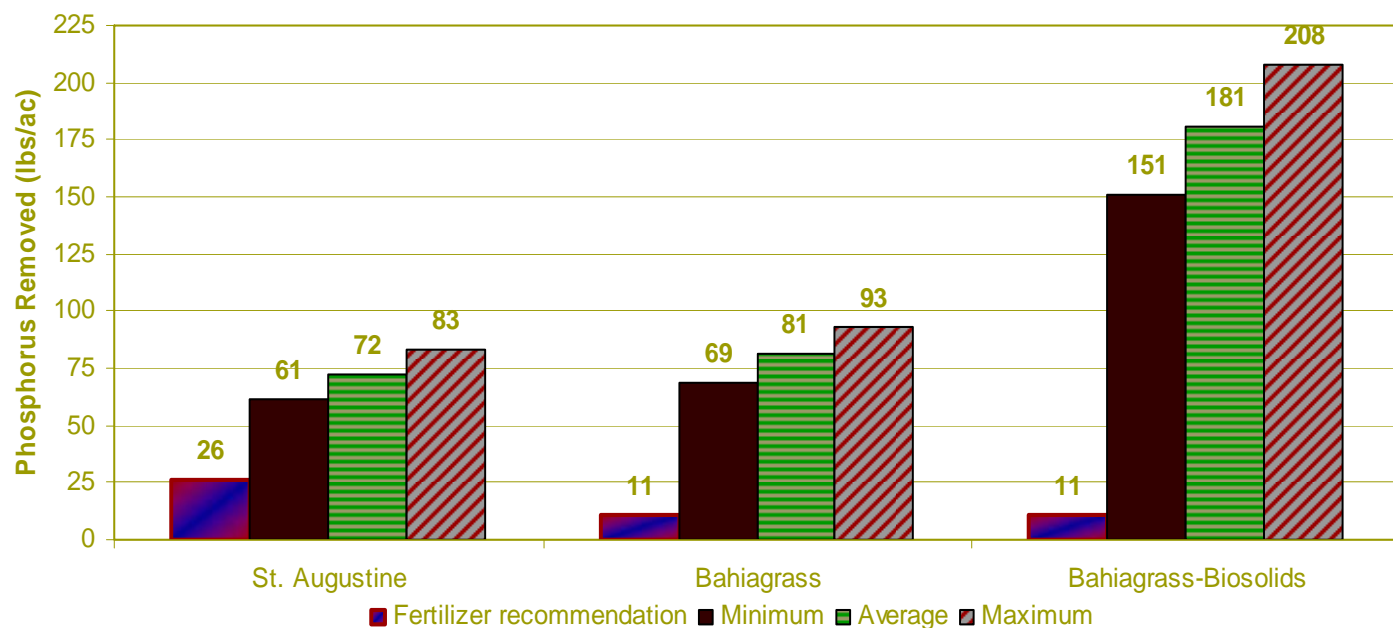
- Fifty-two (52) pieces of sod were collected from 12 central Florida production fields in April 2009.
  - Four (4) samples were collected from each production field.
  - Samples were collected from sites used to produce:
    - St. Augustine grass (*Stenotaphrum secundatum* (Walt.) Kuntze) sod for use in urban landscapes.
    - Bahiagrass (*Paspalum notatum* Flugge) sod for use in urban landscapes
    - Bahiagrass sod used for erosion control along roadways.
- Four (4) fertility management regimes were represented in the sampling project.
  - Landscape Quality St. Augustine grass: Commercial fertilizer applied frequent intervals throughout the year. Sod harvested on 10 to 12 month intervals
  - Landscape Quality Bahiagrass: Commercial fertilizer applied frequent intervals throughout the year. Sod harvested on 12 to 24 month intervals

- **Roadside Quality Bahiagrass:** Commercial fertilizer applied on annual or less frequent intervals. Sod harvested on intervals greater than 24 months. Crop is managed primarily for grazing, sod is a secondary crop.
- **Roadside Quality Bahiagrass with Municipal Biosolids applied:** Municipal biosolids applied on intervals greater than 24 months. Phosphorus is applied as commercial fertilizer or municipal biosolids. Site is managed primarily for grazing, sod is harvested as a secondary crop.
- **Samples were collected and transported to the UF/IFAS Range Cattle Research and Education Center (RCREC) near Ona, Florida for analysis. Samples were divide into three compartments to determine the amount of phosphorus in the above-ground biomass, the below-ground biomass, and the soil pool. Plant and soil samples were dried separately and analyzed for total P. To account for possible contamination from soil the samples of plant biomass were ashed prior to analysis.**
- **All samples were obtained from soils mapped as sand or fine sand.**

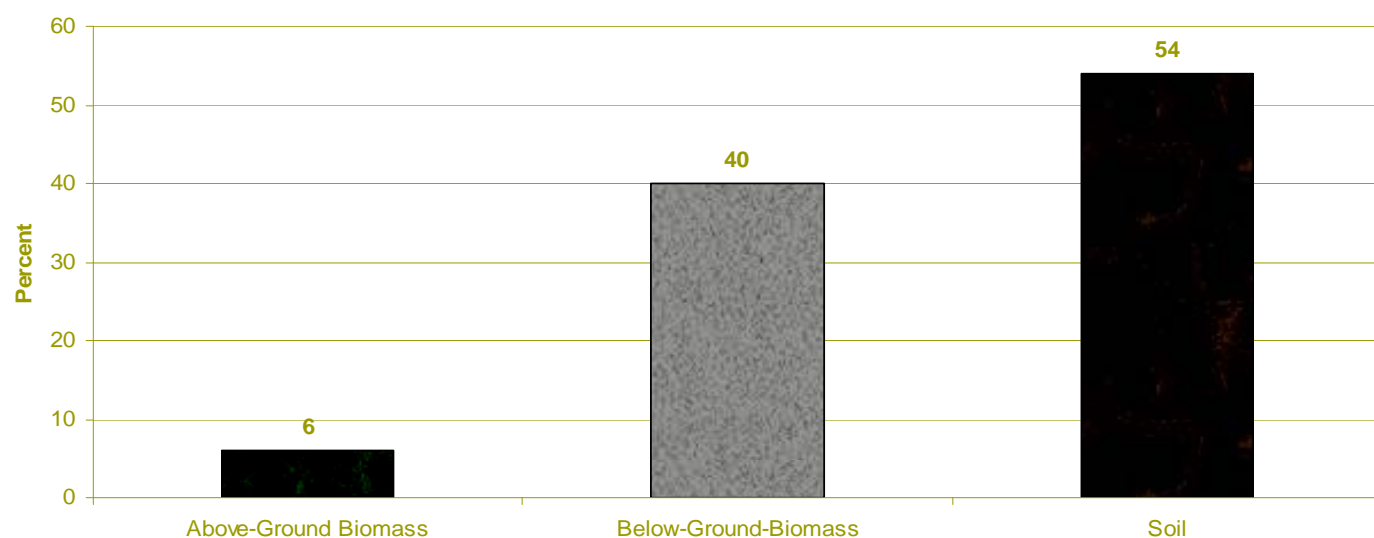
#### **OBSERVATIONS:**

- **P removal rates varied from 60 to 500 pounds of P per acre. This is to approximately 140 to 1,160 lbs of  $P_2O_5$  per acre. This estimate assumes the entire area will be completely harvested.**
- **Typical sod harvest yields range between 28,000 and 38,000 square feet per acre.**
- **Assuming an medium yield of 33,000 sq. ft./acre, the average P removal is estimate to be:**
  - **St. Augustine grass – 72 pounds per acre (163 lbs.  $P_2O_5$  per acre)**
  - **Bahiagrass (grown on chemical fertilizer)– 81 pounds per acre (185 lbs.  $P_2O_5$  per acre)**
  - **Bahiagrass (grown with bio-solids) – 181 pounds per acre (411 lbs.  $P_2O_5$  per acre)**
- **Soil removed from the site during harvest account for most of the phosphorus removal (54%).**
- **Below-ground biomass contains approximately 40% of the p removed.**
- **Above-ground biomass contains approximately 6% of p removed.**
- **Phosphorus removal rates are significantly higher than current University fertilizer recommendations, SL 129.**
- **Soil removed from the site during sod harvest varied from approximately 58 to 223 tons per acre.**

# Estimated Phosphorus Removal Rates During Typical Sod Harvest (33,000 sq. ft per acre = 82.5 pallets per acre)



## Percent of P Removed by Sod Faction





## **CONCLUSIONS:**

- 1. Sod harvest can remove significant amounts of phosphorus.**
- 2. Greater amounts of phosphorus was removed from sites that had been fertilized with bio-solids.**
- 3. Sod harvesting can effectively reduce phosphorus build-up on nutrient application sites.**
- 4. Large amount of soil is removed from the site during sod harvest.**

Special Caveat: All samples were obtained following a cold, dry winter, which severely stressed sod production in central Florida. Therefore, additional analysis are recommended to confirm the conclusions of this project.

This project was completed with the financial support of the Florida Grazing Lands Conservation Coalition (FGLC) and the University of Florida Institute for Food and Agricultural Sciences (IFAS). The authors also would like to acknowledge the sod producers who voluntarily participated in this project.

## The Basics of Fertilizing Pasture<sup>1</sup>

Martha Thomas and Maria Silveira<sup>2</sup>

### Introduction

Producers who are managing their pastures for maximum forage production need to understand how to read and apply fertilizer recommendations correctly. The soil lab report recommendations supply the pounds per acre of certain nutrients and this must be converted to pounds of a manufacturer's mixture which is bought and then applied. By applying these recommendations properly, producers will get the most out of money spent and also protect the environment from excess nutrients.

Pasture management is the key to cost-effectively feeding grazing livestock. Forages are an effective way to supply nutrients, protein and energy to animals. However, productive pastures that supply sufficient amounts of nutrients to livestock require careful management of soil pH and fertility. Liming and fertilization are common management practices that can increase both forage production and nutritive value.

This article outlines the basics of pasture fertilization whether you are fertilizing for grazing,

seed harvesting, or hay production. To begin with, what is N-P-K and what does it do for the pasture?

There are 17 essential mineral nutrients that plants require to survive. Some essential nutrients are found in sufficient amounts in the soil, such as zinc (Zn) and iron (Fe), while others need to be added as fertilizer. Nitrogen (N), phosphorus (P) and potassium (K) are known as macronutrients because plants require them in large amounts. These nutrients are typically applied as a fertilizer mixture. When reading the label on a fertilizer bag, the grade or ratio identifies the percentage by weight of  $N-P_2O_5-K_2O$  in the mix. The chemical symbols shown on the label that designate various fertilizer constituents may confuse users who have no chemistry background. For example, nitrogen is listed on the label as the element N; phosphorus is given as the oxide  $P_2O_5$  (i.e., diphosphorus pentoxide); and potassium is listed as the oxide  $K_2O$ .

For example, a 100 pound bag of off-the-shelf 20-5-10 fertilizer contains 20% N, 5%  $P_2O_5$  and 10%  $K_2O$ , which equates to 20 pounds of N, 5 lbs of  $P_2O_5$ , and 10 lbs of  $K_2O$  in the bag. The remainder of the weight is filler, which is often sand, limestone, and/or

1. This document is SL269, one of a series of the Soil and Water Science Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date October 2008. Revised November 2008. Visit the EDIS Web Site at <http://edis.ifas.ufl.edu>.

2. Martha Thomas, extension agent, Lake County Cooperative Extension; Maria Silveira, assistant professor, Department of Soil and Water Science, Range Cattle Research and Education Center (REC)-Ona; Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL 32611.

All chemicals should be used in accordance with directions on the manufacturer's label.

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organic materials like biosolids. Producers who purchase fertilizer by the ton can customize the fertilizer grade depending on their fertilization need.

It is essential to test the soil every 2 to 3 years to determine lime, P and K requirements. Fertilizer application rates are calculated based on the forage crop needs and soil test results. Do not apply fertilizer if a soil test indicates the soil nutrient content is sufficient.

Unlike P and K, N application rates are based on expected yields (Table 1). It is important to use realistic yield expectations to avoid excessive cost and the environmental hazard associated with over-applying N fertilizer. Nitrogen is the most limiting nutrient in Florida pastures, therefore N fertilization usually results in an increase in forage yield and crude protein. Fertilizer should be applied in early spring to maximize growth and a decrease feed cost. If a second application is needed, it should be done after the first hay cutting. The more N you apply, the more P and K will be taken up as grass yield increases.

Table 1. Nitrogen fertilizer rates needed for three levels of forage growth.

Forage growth	N rate (lbs/acre)
Low	50 – 60
Medium	100
High	80 + 80 split application
* N recommendations shown in this table are only valid for grazing bahiagrass pastures. Other forage species or management (hay, seed, etc) will require different N application rates.	

### Fertilizer Rate Calculation Example

A producer wants to fertilize a pasture with 100 lbs N, 25 lbs  $P_2O_5$ , and 50 lbs  $K_2O$  per acre. He/she could select a common blend like 20-5-10 and calculate the lbs of fertilizer needed per acre:

100 lbs N per acre / 0.20 = 500 lbs of 20-5-10 per acre.

Notice that if you use  $P_2O_5$  or  $K_2O$  to calculate the rate, the answer is the same:

25 lbs  $P_2O_5$  per acre / 0.05  $P_2O_5$  = 500 lbs of 20-5-10 per acre.

50 lbs  $K_2O$  per acre / 0.10  $K_2O$  = 500 lbs 20-5-10 per acre.

Therefore, 500 lbs of 20-5-10 per acre will provide the desirable rates of N-P-K. Applying this rate of fertilizer can be very expensive, so you should only fertilize for your production needs. This is a situation where custom blends may be an attractive option.

Fertilizer recommendations can vary according to the forage-management system. For example, if the pasture is only used for grazing, less fertilizer is needed than the amount necessary for a hayfield. Similarly, some forages like bahiagrass can persist with less nutrients than others like Tifton-85 bermudagrass. With the high cost of fertilizer, it is important to consider all the factors discussed above when developing cost-effective fertilization programs for forage crops in Florida. For more detailed information about N fertilizer rates for specific forage crops, refer to *Fertilizing and Liming Forage Crops* by Y. C. Newman, C. Mackowiak, R. Mylavarapu,

and M. Silveira. This document is available online at <http://edis.ifas.ufl.edu/AG179>.

### Sources of Nitrogen

N fertilizers typically used in forage production include:

- Ammonium nitrate (33-0-0)
- Ammonium sulfate (21-0-0-24S)
- Urea (46-0-0)
- Organic sources (e.g., biosolids, animal manure, poultry litter)

## How can you AFFORD not to fertilize?

MARTHA THOMAS  
LAKE COUNTY UF/IFAS  
LIVESTOCK AGENT



## Production Goals

- What are your production goals?
  - Raising feeder calves
  - Raising replacement heifers
  - Raising bulls
  - Growing Hay
  - Growing Annual Grasses
- How can fertilizing help you meet your production goals?
  - Fertilizer promotes healthy forages

## How Does Fertilizing Pay You

- Higher Pregnancy Rates
- Heavier Weaning Calves
- Healthy weed free pastures
- High protein hay
- Higher yielding hay crops



## Hay

- Why do we care about the protein in Hay?

If hay is poor quality you are wasting time and money bailing. If hay is lacking nutrients you will still have to provide more feed to get cattle to rebreed.

So your goal should be to fertilize and cut at the proper time to get the most out of each cutting.

Less rolls of high quality hay is better than a bunch of poor quality hay.

## Pregnancy Rates

The first goal in a beef operation is to increase pregnancy rates because this effects the bottom line more than any other factor.

Forages are the most economical means of feeding cattle.



## Why fertilize pastures in spring

- Spring is when grass is low in supply and high in demand.
- Spring is optimum time for breeding cattle so you want nutrient intake high so they will cycle and rebreed.
- When summer rolls around there is usually plenty of grass available.
- Summer bahia grass is poor quality because of increased lignin and high in moisture content.



### Weaning Weights

- Besides good genetics why do calves grow?

Mothers Milk

Good Forage

Both of these are dependent on fertilizing pastures.

### Replacement Females

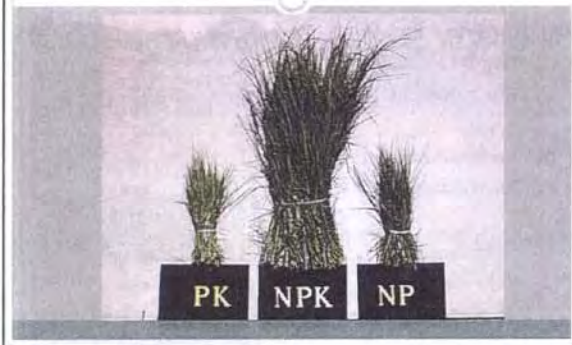
- If you are raising your own replacement females they have to be 65% of mature weight to breed at 1 year of age.
- How much do your heifers weigh at weaning and what are you doing to prepare them for breeding?
- This is impossible to do with out really good forage and supplemental feeding after weaning.

### Soil Condition

- If the pastures are left unfertilized for several years it can be detrimental to the growth of forage.
- Thus negatively impacting cattle health and production.



### Balance Nutrients



### No Fertilizer - Cattle

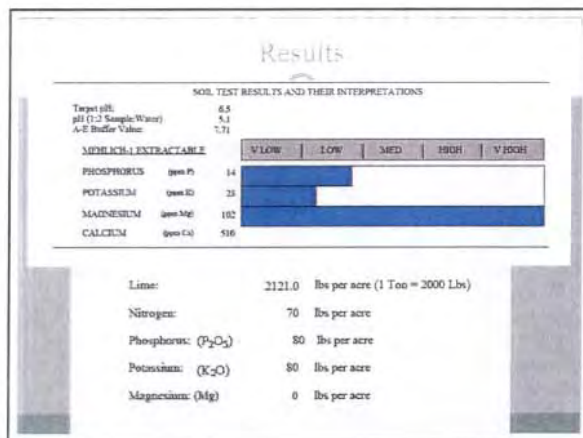
- A sure way to save money is no fertilizer but that leads to a loss of about 1,700 lb per acre per year of bahia forage.

Is this a loss you are willing to take thus reducing productivity of herd and your cattle's reputation?

### No Fertilizer - Hay Fields

- Cutting out required nutrients will lead to a loss of stand thus drastically decreasing yield.
- This loss in stand will take several years to make right.
- It will take several years of fertilizer application to get nutrients back to the proper levels.





### Bermuda Hay

Bermudagrass Production in Florida

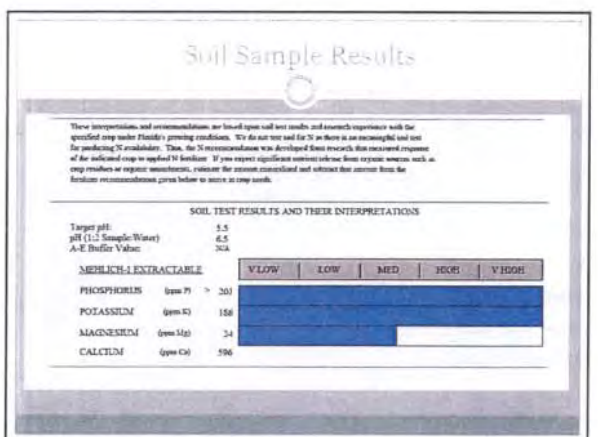
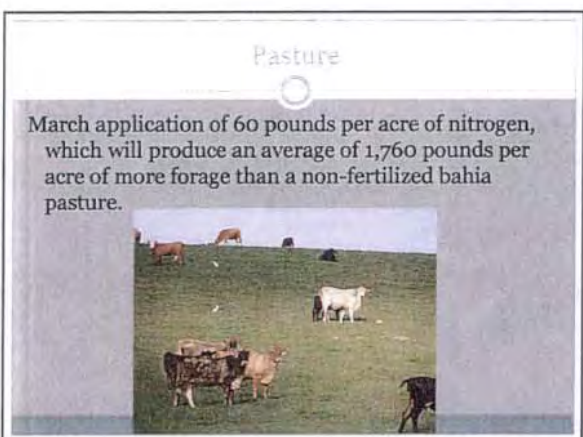
Table 1. Estimates of crude protein, dry matter yield and nitrogen removal for bermudagrass harvested every six weeks.<sup>1</sup>

Applied N (lb/acre) <sup>2</sup>	Crude Protein (%)	Optimum Season		Dry season	
		Dry Matter (tons/acre)	N Removal (lb/acre)	Dry Matter (tons/acre)	N Removal (lb/acre)
100	9.2	5.0	160	2.5	75
200	11.0	7.0	250	3.5	125
300	12.2	8.8	340	4.4	170
400	13.1	9.8	410	4.9	205
500	13.8	10.4	460	5.2	230

<sup>1</sup>University of Florida, IFAS, Circular 838, "Estimation of bermudagrass production in Florida" by A. R. Overman et al.  
<sup>2</sup>Applied in split applications over growing season.

- ### Weeds
- Weeds are caused from bare spots in the grass. These spots are caused from stressed caused by overgrazing, drought, and poor nutrients.
  - After killing weeds best way to control them is help the grass to out grow them by fertilizing it so it will fill in those bare spots.
  - Low pH encourages growth of undesirable grasses.

- ### Application Timing
- Timing of application to coincide with the expected season of maximum growth response is the desired goal.
  - When the quantity and quality is most beneficial to the cattle for which it is targeted.
- Bermuda- spring and after 1<sup>st</sup> cutting  
 Bahia-spring  
 Winter Annuals- at planting and 1 month after grazing



## Soil Sample Results for Hay

For hay fields apply 80 pounds of Nitrogen per cutting.

LIME AND FERTILIZER RECOMMENDATIONS	
Clay:	Improve soil potential per acre after that: <a href="http://soilslab.ifas.ufl.edu/pdf%20files/diagnostic/diag100p.pdf">http://soilslab.ifas.ufl.edu/pdf%20files/diagnostic/diag100p.pdf</a>
Lime:	0.5 lbs per acre (1 Ton = 2000 lbs)
Nitrogen:	100 lbs per acre
Phosphorus (P <sub>2</sub> O <sub>5</sub> ):	0 lbs per acre
Potassium (K <sub>2</sub> O):	0 lbs per acre
Magnesium (Mg):	0 lbs per acre

Recommendations are based on soil test results. These recommendations are for general use only. For more information, contact your local extension agent.

Soil Test Results: 1/15/12 121 121 121

## Soil Sampling

### All Forage Soil Sample

<http://soilslab.ifas.ufl.edu/pdf%20files/SS18600.pdf>

### Bahia Soil Sample

<http://soilslab.ifas.ufl.edu/pdf%20files/BahiaProtocolForm.pdf>

## Basics of Soil Nutrients

- If you don't stick to the basics you will pay for it eventually.

**Lower**  
Weaning Weights  
Pregnancy Rates  
Hay Production



## What is 20-5-10

- N- 20% nitrogen  
 $.20 \times 300 \text{ lbs/acre} = 60 \text{ lbs per acre of N}$
- P- 5% phosphorus  
 $.05 \times 300 \text{ lbs/acre} = 15 \text{ lbs per acre of P}$
- K- 10% potassium  
 $.10 \times 300 \text{ lbs/acre} = 30 \text{ lbs per acre of K}$

## Practice

You have a 40 acre pasture that needs 60 pounds of Nitrogen, 0 pounds of Phosphorus, and 40 pounds of Potassium. Which mixture will you buy and how many pounds per acre are needed.

10-10-10- \$325  
20-0-10- \$390  
20-5-10 \$410  
18-0-9 \$350

## Answer

- 300 pounds per acre of 20-0-10  
 $300 \times .20 = 60 \text{ pounds of nitrogen}$   
 $300 \times .10 = 30 \text{ pounds of potassium}$

### Things to ponder

- Fertilize 1 acre per cow/calf pair each spring. Using a 20-0-10 that would be approximately \$55 per cow. Is having a bred cow and a nice calf to sell worth \$55?
- Rotate pastures that you fertilize. Don't try to do the whole ranch every year.
- If nothing else make sure the pH is right.

Questions?  
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# Toxic Plants

## Recent Farm Animal Poisonings

### Central Florida

Join University of Florida Livestock/Natural Resources Agent Dennis Mudge on any of the over two hundred farm visits he makes annually, and you will quickly value IFAS and what the County Extension Agents do for farmers.

On-site pasture visits reveal to animal owners dangerous weeds that frequent their animal's grazing areas. Dennis has found that "the average farm or ranch has six to fourteen weeds that they need to become very aware of. They have the potential to make farm animals ill and even cause death when ignored." Control of these weeds is very important for your animal's safety. Identifying poisonous plants is a learned skill that is the responsibility of all animal owners.

### Observational Study

**Horses:** Even the best managed horse farm must observe opportunistic weeds and dangerous trees. Horse ranches grazing up to wetlands or wood lots especially need to take care.

Recent poisonings have come from American Poke weed. This is a weed that seems to appear over night and often causes gastrointestinal problems including colic, but does occasionally cause death.

Hemlock kills horses every year due to the seriousness of its toxicity. Common in Florida, it is often along fence lines and next to stables.

Bracken Fern must be mentioned in that horses will actually seek it out when they develop a taste for it. Common in Florida wetlands, when present in large amounts it is a serious concern. Ornamentals are often toxic and proximity to these can be dangerous. Probably the most dangerous is oleander.



Pokeweed



Poison  
Hemlock



Spotted Hemlock



Bracken Fern



Oleander

### Farm/Ranch Case Studies Series

#### Fact Sheet #032710



**Dennis Mudge**  
Extension Agent III  
Livestock/Natural  
Resources/Public Policy

Orange County/University of  
Florida IFAS  
Extension Education Center  
6021 S. Conway Road  
Orlando, FL 32812  
407-254-9200





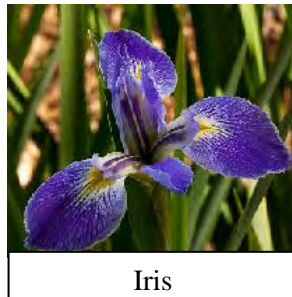
**Cattle:** Lantana kills cattle every year. This plant is very difficult to kill but diagnosis is often easy. Yet cattle experience discomfort and die each year from it.

Wet areas always propose a threat to cattle in that many weeds in these areas are poisonous. Left alone for most of the year, cattle can get in trouble when spending too much time looking for “green feed” or trying to “cool off” in the water. Iris, lilies and horsetail have all killed cattle recently.

When cattle travel daily through wooded areas to reach nearby pastures, care will need to be taken. If they stop to feed, woodland greenery can kill them. Recent poisonings have occurred with Coral ardesia and Coffee senna.



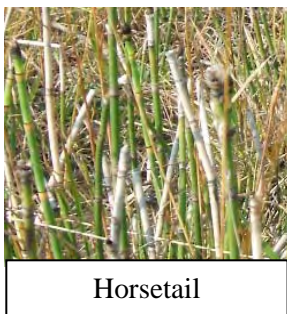
Lantana



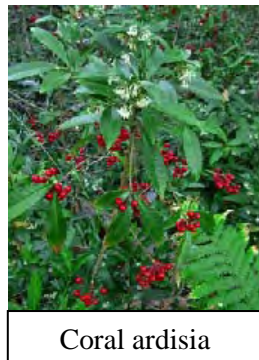
Iris



Lillies



Horsetail



Coral ardisia



Coffee senna

**Goats:** We say that goats can “eat anything”... they are “browsers” and are “tough.” None of this is true. Goats too can be killed by toxic plants if they are allowed to eat them. Recent poisonings have occurred from Black Oak, Cherry Laurel, Yellow Jasmine, and Pin Cherry.

A poor practice is to cut off tree branches and throw them to your goats. Goats can clean out areas by picking and choosing what and how they eat. But a farmer who gives toxic trees to his goats as the only food that day will quickly learn how fast he or she can kill them. Jasmine is a vine that is toxic and some varieties are extremely toxic.



Cherry Laurel



Yellow Jasmine



Black Oak



Pin Cherry

**Poultry:** “Free ranging” poultry is a recent phenomenon in Florida which is, of course, just a return to bygone practices. If your free ranging poultry escapes the predators, they may not the toxic plants.

Recent poisonings have occurred from poultry eating toxic seeds from Bladderpod, Jimson weed and Sesbania.



Bladderpod



Jimson weed



Sesbania

**Rabbits:** Rabbits allowed to roam a yard or farm yard may also graze on toxic plants. Recently poisonings have occurred with crotons.



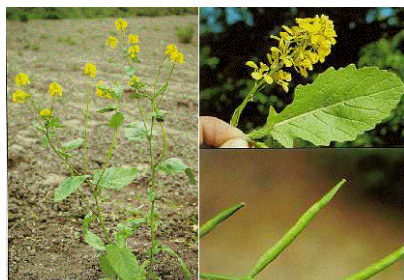
Croton



Sago Palm

**Farm Dogs:** Each year dogs are killed by eating the fruiting flower portion of the sago palm. This is an awful smelling part of the plant, but will kill a dog quickly if he or she devours it.

**Hay** is not always safe. Even northern hay needs to be examined. Burdock and buttercup dried in hay will kill any animal.



Mustard



Burdock



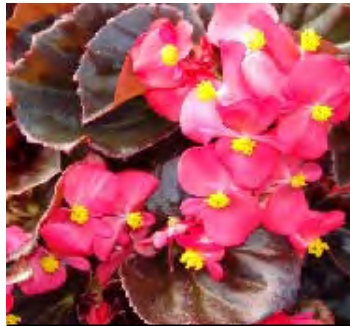
Buttercup



**Cats:** Cats eat grass commonly to help them regurgitate hairballs. If shut up inside, they will attempt to do the same with house plants. It may work or it may kill them. Recent poisonings have occurred with English Ivy, begonias and asparagus fern.



English Ivy



Begonia



Asparagus Fern

**All Animals and Children:** Each year Dennis makes farm visits where animals have died from the following plants: Nightshade, Sicklepod, Chinese Tallow, and butterfly plants like Milkweed, Crotalaria and Cassia. While Nightshade and Sicklepod are weeds that commonly occur, the butterfly plant weeds are escapees from your neighbor's yard.

Their control is very important. Ignoring them could kill your animals. Any farm animal, pet or child can die from eating plants provided for butterflies.

For further information, contact the Orange County/University of Florida IFAS, Extension Education Center office.



Nightshade



Chinese Tallow



Crotalaria



Cassia



Sicklepod



Milkweed

## **Winter Feed Estimator: A Practical Tool for the Beef Cow-calf Producer**

Mark Warren, Flagler County Extension, Ed Jennings, Multi-county/Pasco Extension, and Matt Hersom,  
Department of Animal Sciences

Producers often estimate hay needs for their beef cow herd based on rules of thumb and neighbor's advice that may not be accurate for their individual operation. One common approach is to allow two round rolls for every cow to be supplemented during the winter. While this may get you started, somewhere along the way there is likely to be a system failure. The focus of this paper and the supporting slide chart are to provide a simple approach for estimating dry matter feed requirements of the beef herd and then converting those requirements into an estimate of required hay or silage round rolls.

### **Factors Affecting Interpretation**

With a practical tool it not feasible to consider and account for all of the possible variables that might affect the feeding value of particular forages. However, some specific issues are important.

#### Nutrient value

Nutritional quality of conserved forages can be measured by a variety of terms and can be highly variable even when all other factors appear constant. Forage species, fertilization program, growing conditions, and harvest management all interact to affect forage quality. While these variables need to be taken into consideration, the feed estimations in this tool are based on cow dry matter requirements only. It is assumed that the nutritional quality of the feedstuffs (ie. stored forages) is adequate for meeting the daily requirements of the herd. Additional supplementation may be required if the forage quality is low or the livestock requirements exceed the nutritional value of the harvested forages.

#### Moisture measurements

Dry matter content is the portion of feed remaining when all of the moisture is removed. Hay probes for measuring bale moisture can be used to make an estimation of moisture however the results are only marginally accurate. Submitting a sample to a forage testing laboratory is the best approach for measuring moisture content. In addition to moisture, the test will also provide important nutritional information. Production lots should be sampled independently for both physical and nutritional parameters.

#### Alternative nutrient supplies



The use of other feedstuffs to supply dry matter and nutrients will affect the accuracy of these numbers. Standing forages (either stockpiled or cool season annuals), supplements, and other provided feeds may dramatically reduce the stored forage requirements. The herd requirements haven't changed but the nutrient source has.

#### Feeding/ storage systems

Ideally forages would be protected from nutrient losses during storage. The calculations in this tool assume no loss during storage or feeding. In this scenario feeding and storage losses would be minimized. Deviations from optimal storage and feeding can result in dry matter losses over 50%. Keep in mind that the outer six inches of a five foot diameter bale is 34% of the total mass and the outer twelve inches is over 60% of a bale weight.

#### Bale size determinations

Most bales are marketed based on assumed weights. Large bales are assumed to be over 1,000 pounds and small bales are assumed less than 800 pounds. In a study on storage losses, bale weights were averaged to establish a baseline. All bales came from the same baler and the dimensions were roughly 4x5 feet. The average weight of the bales was 785 pounds, 215 pounds less than anticipated 1,000 pounds. Overestimation of bale weight can be a serious issue. The best way to estimate bale weight is by weighing a representative sample utilizing a set of truck scales.

#### Animal condition and management

In this tool, body condition score (BCS) is assumed to be adequate (mean = 5) on the BCS scale of 1 to 9 and remain constant. Management to improve or decrease average herd body condition by manipulating supplementation will necessitate further interpretation of the stored forage estimation.

#### Frame score estimations

Producers often misjudge the frame size and body weight of their cattle. Keen managers utilize outside data to improve the accuracy of their estimations. Access to a set of scales removes the guess work. Alternatively, purchasing records, sale weights of culled cattle, or an unbiased expert may help. Once weight averages are determined the frame score can be used to place cattle into the small, medium, or large frame category. Be sure that averages are really herd averages by collecting data on a large number of individuals.

### **Utilizing the Winter Feed Estimator**

For this tool, daily dry matter intake requirements are calculated as 2.5% of body weight. For example, a cow with a body weight of 1,150 is a medium framed cow; her daily dry matter requirements are  $(1,150 \times 0.025 = 28.75)$  about 29 pounds per day.

Step 1. (Dry Matter Estimator *side*)

Pick a Frame Size based average cow body weight (Small, Medium, or Large).

Step 2.

Slide chart to appropriate number of cattle (top of chart “Determine Number of Cattle”).

Step 3.

Estimate number of weeks to be fed. Based on past years experiences and/ or predictive seasonal weather forecasts, try to accurately determine current year feeding needs.

**Read the value in the appropriate frame score column. This is the estimated number of tons of conserved forage required. Carry this number over to the other side.**

Step 4. (Dry Matter Conversion *side*)

Select bale size as produced (cured hay on left or balage on the right).

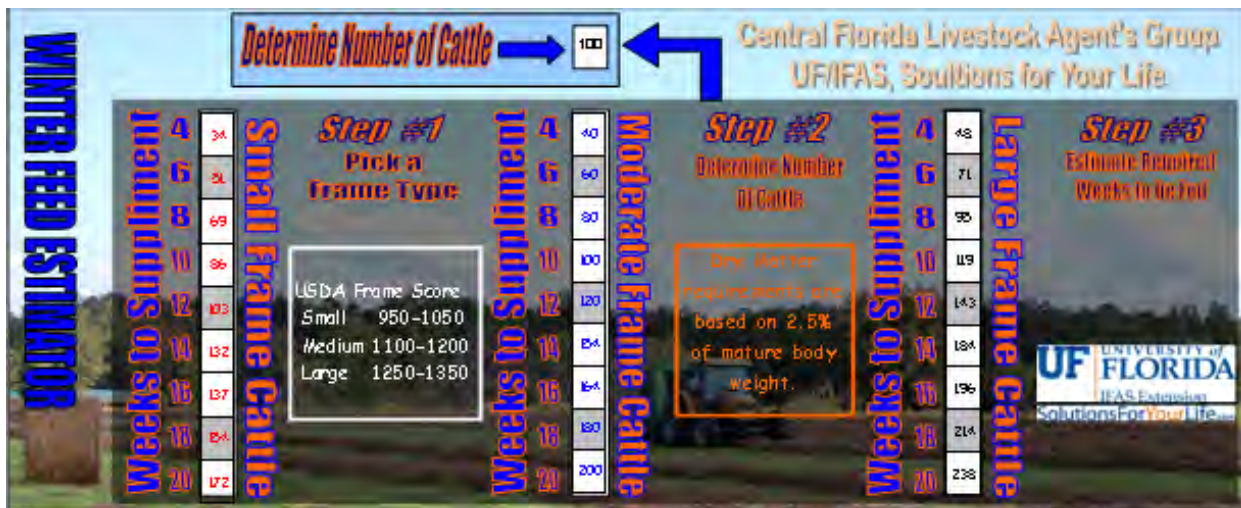
Step 5.

Find the nearest required tons in either the “Cured Hay” or “Balage” column (Orange print and arrows) then read the required bales based on measured moisture content. You may need to use a multiplication factor for large amounts of forage required.

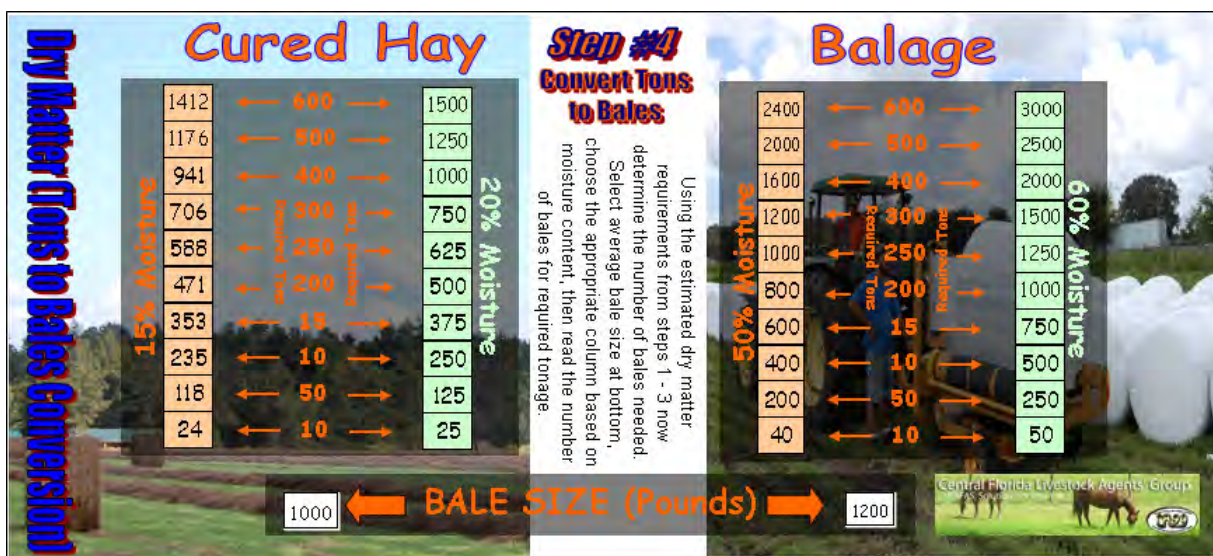
Many producers are shocked by the estimated needs, but they accurately reflect the dry matter / bale requirements of a typical cow-calf herd to supply all of the feed requirements. Adjustments can be made based on individual situations and alternatives can be planned to reduce your dependency on stored forages. Utilizing this tool can help to accurately plan cow-herd forage needs. For more information contact your local county extension agent.

Example of the sliding scale tool described in the proposed EDIS document. The tool will be a laminated sliding scale approximately 10 x 4 inches and double sided.

There are 10 different herd size options (10, 20, 30, 40, 50, 100, 200, 300, 400, 500)



There are 5 different bale size options for both hay (600, 800, 1000, 1200, 1400) and balage (800, 1000, 1200, 1400, 1600).



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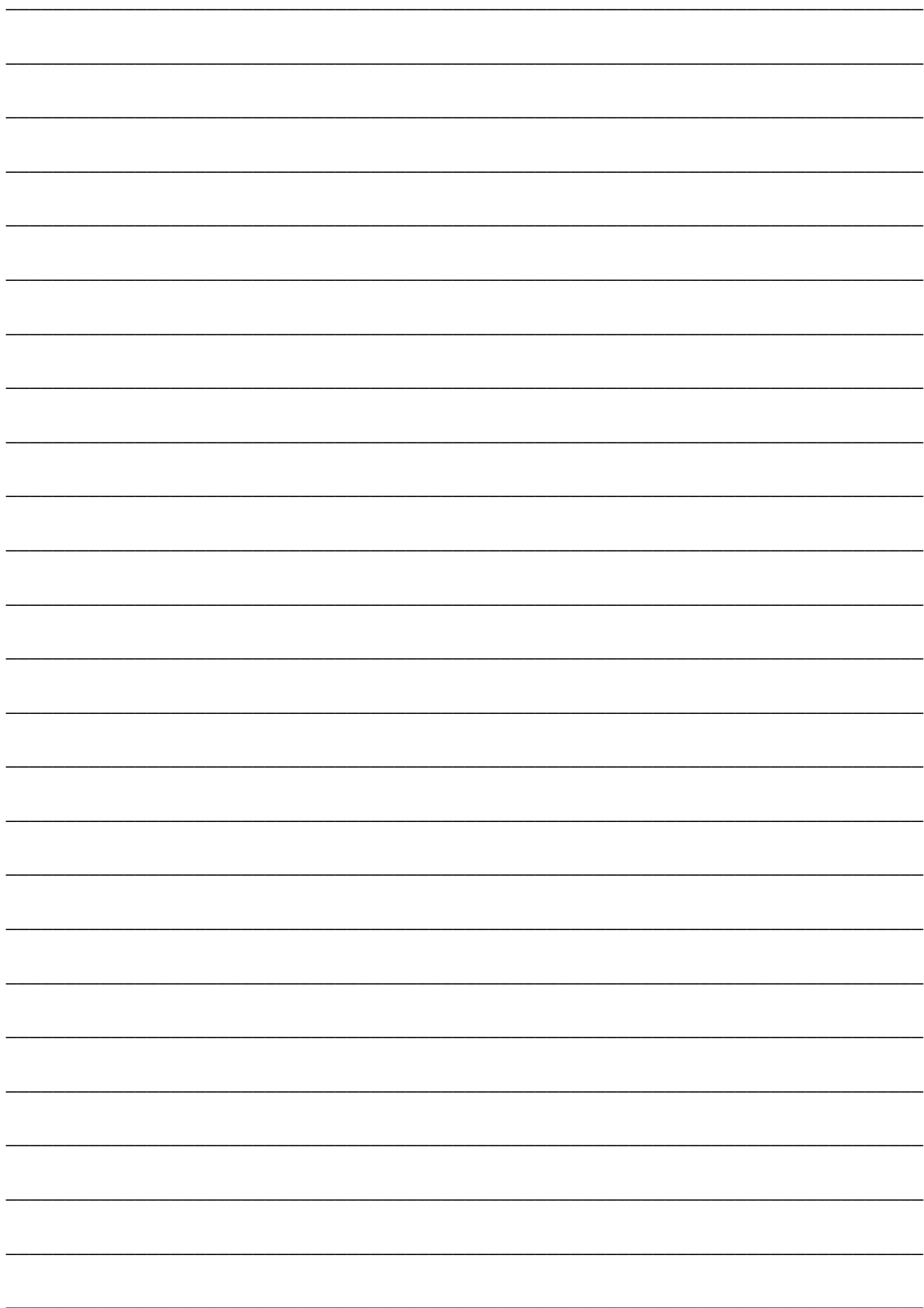
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**Spring Ranchers Forum  
Held at Yarborough Ranches  
Central Florida Livestock Agents' Group  
March 25, 2010**

**Overall Program Evaluation:**

**YES**

**NO**

Was this the first time you attended an Extension Program?			
Did you share this information with others?			
Did you improve your animal science skills because of this program?			
Did you follow the Best Management Practices given?			
Did you experience an improved economic return because of this program?			
Have you improved your agricultural and environmental skills because of this program?			
<b>Individual Topic Evaluation:</b>	<b>Useful</b>	<b>Somewhat Useful</b>	<b>Not Applicable</b>
<b>"Mole Cricket Control"</b> Dr. Dr. Norman Leppla, UF/IFAS/Insect Pest Mgmt., Entomology, Nematology			
<b>"Emerging Trends in Parasite Management "</b> Sharon Fox-Gamble, Livestock Agent, Volusia County, CFLAG, UF/IFAS			
<b>"Seeded Bermudagrasses for Florida"</b> Dr. Yoana Newman, UF/IFAS, Forage Extension, Agronomy			
<b>"Saving Your Grass: Grazing Management Strategies for Horse Pastures"</b> Mark Shuffit, Livestock Agent, Marion County, CFLAG, UF/IFAS			
<b>"Phosphorus Removal with Sod Harvest"</b> Joe Walter, Livestock Agent, Brevard County, CFLAG, UF/IFAS			
<b>"How Can You AFFORD Not To Fertilize?"</b> Martha Thomas, Livestock Agent, Lake County, CFLAG, UF/IFAS			
<b>"Toxic Plants: Recent Farm Animal Poisonings"</b> Dennis Mudge, Livestock Agent, Orange County, CFLAG, UF/IFAS			
<b>"Dry Matter Supplication"</b> Mark Warren, Livestock Agent, Flagler County, CFLAG, UF/IFAS			
If you have attended the Spring Ranchers Forum before, please tell us in what way the knowledge you gained impacted your farming/ranching operation.			
Why do you keep coming to the Spring Ranchers Forum?			
How did you hear about this year's Spring Ranchers Forum?			