



# Cooperative Extension Service

## Institute of Food and Agricultural Sciences



# RANGE CATTLE REC NEWSLETTER

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### *Calendar Of Events*

#### **March**

14 FCA Legislative Quarterly Meeting, Tallahassee, FL

#### **April**

25-27 Reproduction Management School. SFBFP, Wauchula, FL. Ph: 863-993-4846

#### **May**

3-5 University of Florida Beef Cattle Short Course, Gainesville, FL. Ph: 352-392-9095.

#### **June**

1 Range Cattle REC Field Day, Ona, FL. Ph: 863-735-1314.

28-30 FCA Annual Convention, Marco Island, FL.

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## Editorial:

### - Bahigrass Rejuvenation -

It seems that with the coming of spring, ranchers get an urge to overhaul their "sod-bound" bahigrass pastures with disks, choppers, or specialized equipment designed to open-up the sod. Several years ago Dr. Mimi Williams (USDA, Brooksville) and I (Range Cattle REC, Ona) compared April treatment of bahigrass in each of 2 years with a disk, Marden chopper, Lawson chopper, and an Aer-Way aerator. We measured soil compaction, water infiltration before and after treatment and compared bahigrass yield and tiller density in treated vs non treated areas. At both locations, Mardin and Lawson choppers reduced compaction in the surface 6 inches of soil, compared with untreated areas. At Ona, the Aer-Way treatment resulted in the greatest reduction in soil compaction, while at Brooksville it was not different from untreated areas. One of the claims for rejuvenation equipment is that there is a loosening of the soil, and we found this to be true down to the approximate depth of machine penetration. Immediately after treatment, there was no improvement in water infiltration at Brooksville. At Ona, the Aerway treatment had greater water infiltration than untreated areas, with Marden and Lawson treatments intermediate but not different from untreated areas. When it occurred, improvement in water infiltration did not last more than a month. Marden and Lawson machines reduced bahigrass tiller density at Brooksville by 10-20% compared with no treatment, while the Aer-Way had no effect. At Ona, there was no change in tiller density in either year. For 2 months after treatment, there was greater forage production in untreated areas compared to machine treatment at both locations in both years. **At 1, 2, and 3 years after treatment there were no differences in bahigrass forage yield at either location.** More recent studies on bahigrass at three locations in Mississippi have indicated that forage yield was not improved by machines designed to disrupt the sod. I believe that Florida cattlemen who are considering using a pasture renovator to enhance bahigrass forage production on flatwoods soils in the spring should be aware that their money may not be well spent. I think fertilizer or weed control could be better expenditures.

(RSK)

## - Sludge: Waste or Fertilizer -

Sewage sludge has generally been perceived by the public as well as the agricultural community as a waste which has little beneficial use and needs to be disposed of in landfills or incinerated. However, with approximately 12 million tons of sludge in USA, annually, landfill space has become scarce. Many states estimate that their landfill capacity will be exhausted in the near future. For this reason many states have banned disposal of sludge in landfills.

Diminishing landfill space, increasing landfill costs, and concern over air pollution from incineration of wastes have generated a strong interest in finding alternative methods for sludge disposal. One alternative is to use sludge as a fertilizer on pasture grasses. Not only is sludge a source of slow release plant nutrients (e.g. nitrogen, phosphorus, sulfur, micronutrients, etc.), it can also increase the organic matter content of soils. The concept of using organic wastes such as sludge is not new. Organic wastes have been used by people around the world for thousands of years to fertilize cropland. Prior to commercial inorganic fertilizers being introduced in the early 1940's, the major way of fertilizing was to use organic wastes!

In the past there had been concern over heavy metal contamination from sludges. Over the past 40 years sludges have become substantially cleaner and heavy metal contamination of the environment from sludge application is of little concern. A number of years ago the Environmental Protection Agency (EPA) came out with specific heavy metal limits for sludges which must be met before they can be applied to land. The concentrations of nutrients and heavy metals in sludge should be provided by the sludge hauler to the end user.

Sludges (biosolids) are organic, slow-release fertilizers. Using these materials as organic, slow-release fertilizers for crops and grasses grown in Florida would be a beneficial source of nutrients compared to inorganic fertilizers which leach readily in sandy soils. For the past number of years there has been a dramatic increase in the number of cattlemen using sludge on their pastures. In fact the demand by ranchers for sludge has become so high it is very difficult to find sources of sludge!

For the past six years researchers at the Range Cattle Research and Education Center have conducted field and laboratory experiments to determine the potential uses of biosolids as an alternative to more costly inorganic fertilizers for pasture grasses. Results indicate that yield, protein, and digestibility of bahiagrass and ryegrass were significantly increased with the addition of biosolids. Research has also shown that approximately 60-70% of the nitrogen in biosolids is available to the plant the first year with the other 30-40% becoming available over time. The studies also indicate that sludge lasts over a longer time than inorganic fertilizers. This is a great advantage on our sandy soils where it is quite common for inorganic fertilizers to leach rapidly. The studies have also shown that there are no detrimental effects on the environment from application of sludge or biosolids. Using sludge may in fact become a BMP to help reduce nitrogen and phosphorus runoff and leaching from sandy soils!

(JER)

## - Commercial Corn Varieties for South-Central Florida -

Corn can be extremely important in a livestock feeding program. With its rapid growth and high yielding ability, corn can be harvested and stored as silage and used as a supplement for beef cattle, or incorporated into dairy rations. High quality corn silage can provide dairy and beef cattle with substantial inputs of carbohydrates, possibly reducing the use of expensive grains.

Harvesting corn for silage at the proper stage of maturity can produce 7 to 10 tons/acre dry matter (DM) in 4 to 6 months. During the remaining 6 to 8 months this would allow the land to be used for other crops. In south-central Florida corn can fit into a pasture renovation program or be grown after a winter vegetable crop on mineral or organic soils.

Corn silage usually contains about 30% DM when harvested at the 50% kernel milk level, with a crude protein concentration of approximately 8%. It is high in energy, carotene, vitamin D but low in minerals. To produce high yields of quality corn forage, adapted hybrids, proper seeding date, correct plant population, high fertility, water control, weed, and insect control measures are required.

Trials have been conducted at the Range Cattle Research and Education Center over many years to evaluate commercial corn hybrids for silage and/or grain production and other agronomic characteristics when grown on sandy flatwood soils of central Florida.

Twenty commercial corn varieties were seeded on March 10, 1999.

**Fertility:** Fertilization practices consisted of 0-80-160 lb/acre (N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O) and 4 lb/acre each elemental Mn, Zn, Cu, and Fe (sulfate form) and 12 lb/acre elemental S prior to seeding. Nitrogen was pre-emergence applied at 50 lb/acre, and an additional 100 lb/acre when corn was 12 and again at 24 inches tall, for a total of 250 lb N/acre. Soil pH was 5.8, with adequate amounts of Ca and Mg.

**Plant Population and Pest Control:** Corn was seeded in rows 30 inches apart to a final population of 28,000 plants per acre. Herbicides used were 2.0 lb/acre Atrazine (active) and 2 lb/acre Dual 8E (active) pre-emergence in 30 gal water/acre. To control soil-borne insects, the insecticide Counter 20 CR, or (17 lb active/acre) was applied in 7 inch bands at seeding.

**Irrigation:** A total of 10.8 inches of water was applied in 13 applications using over-head irrigation sprinklers.

**Corn Maturity at Harvest:** Corn plants were harvested for DM yield when the kernels of most varieties were at hard-dent stage. This was coincidental with black layer

formation at the base of kernels. Other variables recorded for the experiment were oven dry grain yield, forage DM yield and percentage, kernel moisture, shelling percentage, and grain-to-stover ratio (DM basis). Grain yield values were converted and expressed in bushels of shelled corn/acre at 15.5% moisture.

**Dry Matter Yield:** Differences were obtained among commercial corn varieties harvested for forage DM (yield and percentage), grain yield, kernel moisture, shelling percentage, and grain-to-stover ratio. Forage DM yield of corn hybrids grown at Ona in 1999 averaged 9.9 tons/acre. These yields ranged from 11.0 tons/acre for 'Pioneer 3163' to 8.3 tons/acre for 'Northrup King NK N 811'. However, no difference in DM yield was obtained between the top 18 cultivars tested at Ona. Dry matter yield of corn forage for the 20 hybrids grown in 1999 was 1.4 tons/acre higher than the average yield obtained during the previous 7 years of testing. Cultural practices (seeding, fertilization, herbicides, etc.) have been essentially the same over all experimental years.

**Dry Matter Content:** Differences in percentage forage DM at harvest were obtained between corn hybrids. Dry matter at harvest averaged 33.4% in 1999, indicating that plants matured slower than 1997 when DM averaged 36.9%. In both years, corn was grown for approximately 106 days. Two Northrup King varieties 'NK 73-N8' and 'NK 83-N5' were among the top yielders, producing 10.9 and 10.7 tons/acre at a DM of 35.4 and 37.0%, respectively. **Varieties that produce high forage yields (Northrup King NK 83-N5) and dry down rapidly, with a high percentage DM at harvest, should be considered for silage.** This variety selection allows the grower to obtain high DM yields and allow plants to mature early enough in the season to be removed from the field before excessive summer rains.

**Grain Yield:** There were differences among varieties for grain yield which averaged 185.3 bu/acre corn (adjusted to 15.5% moisture). Average grain yield for the 20 hybrids grown in 1999 was 20.8 bu/acre higher than the average yield obtained during the previous 7 years of testing. The highest grain yielding varieties were 'Northrup King NK 83-N5', 'Pioneer 3223', 'Pioneer 32K61', 'Pioneer 3163', 'AgriPro AP 9099', and 'Northrup King NK 73-N8', yielding 224, 205, 205, 204, 202, 201 bu/acre, respectively. Pioneer 3163 produced a high forage yield (11.0 tons/acre DM), along with a high grain yield. For grain production, growers should consider Northrup King NK 83-N5, which produced 224 bu/acre shelled corn and had a low kernel moisture averaging 33.8%.

**Grain-to-Stover Ratio:** Grain-to-stover ratio is the proportion of shelled corn relative to the amount of stover (stalk, leaf and cob), on DM basis. The commercial variety Northrup King NK 83-N5 produced 10.7 tons/acre DM and yielded 224 bu/acre shelled corn. This variety had 37.0% DM at harvest, kernel moisture of 33.8%, and grain-to-stover ratio of 57.5:42.5%. This would suggest that for every mouthful of silage consumed by livestock, 57.5% would be corn grain and 42.5% would be stover. This type of silage would be more desirable for backgrounding beef cattle or lactating dairy cattle which requires high energy feed.

Southern corn rust (*Puccinia polysora*), which is normally observed on corn varieties, was not a problem in the 1999 season. Some armyworm damage (*Spodoptera frugiperda* Smith), commonly called bud-worm, was evident on corn plants 4-6 ft tall. No insecticide was used because less than 20% of the plants had bud-worm damage.

**CONCLUSION:** When selecting commercial corn hybrids to be grown and stored as silage, it is best to select varieties that produce high forage and grain yields resulting in a high (approximately 50:50) grain-to-stover ratio. Selected varieties should have a high forage DM percentage and low kernel moisture. If corn hybrids are grown for grain, high grain yields and low kernel moisture are important. Hybrids with low kernel moisture indicate rapid field drying, and earlier harvesting with lower storage costs. Some varieties that produced high forage DM and grain yields in 1999 at Ona were Pioneer 3163, Northrup King NK 73-N8, Pioneer 3146, Northrup King NK 83-N5. Corn varieties consistently producing high yields of forage and grain over a 3 year period were Pioneer 3223, Pioneer 3146, Pioneer 3163, and Pioneer 3085. (PM & MBA)

## - New Bahiagrass Fertilization Recommendations and Phosphorus -

With the revised fertilizer recommendations for bahiagrass pastures by the University of Florida/IFAS, many cattlemen are applying little or no phosphorus. The South Florida Beef/Forage Extension Group collected field data on ranches from nine counties that showed the phosphorus concentration in bahiagrass was reduced by 20% (from an average of 0.32% to 0.26%) when phosphorus was omitted from the fertilizer. Although 0.26% phosphorus concentration is more than adequate for all grazing beef cattle, phosphorus concentration of bahiagrass on one ranch averaged 0.17% when phosphorus was not applied in the fertilizer. Seasonal trends in phosphorus concentration of bahiagrass also occur, with highest levels in the spring and summer and lowest levels in the fall and winter.

The National Research Council recommends that diets of 1000 lb lactating cows contain 0.21% phosphorus at peak milk production (2 months after calving). The recommended concentration progressively decreases to 0.12% at 8 months after calving. Diets of 1000 lb pregnant heifers are recommended to contain 0.17% phosphorus, increasing to 0.23% for the 3 months before calving. At times, the phosphorus content of unfertilized bahiagrass pasture can be deficient for lactating cows and pregnant heifers, particularly during the fall and winter when phosphorus levels in the forage are the lowest. On many ranches in central and south Florida, the fall/winter period coincides with the calving and breeding season when the phosphorus need of cows is the greatest. I recently worked with a ranch that was having bone problems where winter bahiagrass contained less than 0.10% phosphorus.

Even when the phosphorus content of bahiagrass may be below that needed for proper nutrition, it poses no problems to cow/calf production if a good mineral formula is

provided free-choice year-round. It is more economical to provide phosphorus directly to the cow as a mineral supplement than through pasture fertilization that is not contributing to a higher forage yield and quality.

Cattle do not crave for other minerals like they do salt, but they tend to eat more mineral mix during the fall and winter, the period when forages are the lowest in phosphorus and other essential minerals. Under- and over-consumption of a mineral mix offered free-choice may present problems at times. A chronic under-consumption problem requires adjustments in the mineral formula by reducing the level of salt and increasing the level of palatable ingredients such as cottonseed meal, citrus pulp and/or molasses. Over-consumption of a mineral mix is usually not a problem, but can be costly. When over-consumption is a short term problem, feed the mineral mix on a set schedule. It is not a problem if cattle eat all the mineral mix provided before the next feeding because excess minerals are stored in bones, liver and other tissues for use when minerals are not provided by the diet for short periods.

Mineral mixtures and their recommended intakes are formulated for the average ranch situation. It would be prudent for ranchers to occasionally have pasture forages analyzed for phosphorus and other minerals to determine how much of these essential nutrients are provided by the forage. Then make sure cattle are consuming a proper mineral mix in adequate quantities to meet the needs of the cow for phosphorus and other essential nutrients. **(FMP)**

## - Organic Trace Minerals - What are they and do I need them? -

The spring season is a good time to consider the ingredients of our free-choice trace mineral supplements. In most cases, formulations differ only slightly in the mineral source offered. Now, the introduction of organic forms of trace nutrients offers producers a new and potentially productive bullet in our supplementation arsenal.

Over the past decade the introduction of organic trace minerals have made their way into the "main-stream" and are now a common inclusion alternative in many grazing cattle trace mineral formulations. Organic mineral is a generic term used to describe the condition where an inorganic, soluble salt is joined with an organic carrier or ligand, typically an amino acid or small peptide. This complexing action may occur in a variety of manners, most of which are defined and controlled by the American Feed Control Officials. Often the term "chelated mineral" is used to describe all organic mineral sources. This is a misnomer. Some common organic mineral categories include, trace mineral amino acid complexes, trace mineral amino acid chelates, and trace mineral proteinates.

### Common organic trace minerals:

Zinc	Possess the most scientific support as an effective organic nutrient in cattle mineral supplements.
Copper	Second most relevant organic nutrient. Probably most important when forage molybdenum levels are above 3 ppm.
Manganese	Not much support as a single organic inclusion, however, organic manganese is often available in commercial organic trace mineral blends.
Chromium	Currently not approved in the USA. Data suggests that supplemental organic chromium may be effective during periods of increased stress.
Cobalt	Similar to manganese, probably not useful as a single inclusion, but often-found in commercial organic trace mineral blends.

The theory behind the benefit of organic minerals is based on the concept that many inorganic mineral nutrients are bound to an organic ligand, in the small intestine, prior to absorption. By offering a trace mineral source, already bound to an organic ligand, the absorption efficiency (bioavailability) may be improved. This theory has good supporting evidence for organic zinc sources and most likely holds true for organic copper as well.

Some production areas by which organic trace minerals have been shown to be important contributors, include:

1. Reproduction
2. Calf weaning weight
3. Immunity
4. Structural soundness (primarily hoof integrity)

Conclusive research supporting the benefits of organic mineral inclusion in grazing cattle supplements is lacking. Although some studies show a benefit to organic mineral supplementation, many do not. Therefore, it is important to carefully assess your existing mineral nutrition program, considering the economics against potential improvements in cow and calf performance. For example, organic trace mineral supplementation may be economically beneficial when formulated into supplements designed for individuals with special nutritional needs, such as, developing heifers, breeding bulls, high producing

herds, and stressed calves. In other cases, inorganic counterparts may be just as effective in achieving the same level of final production.

When considering the inclusion of organic minerals in a free-choice program, it is especially important to monitor intake. Intake control is best accomplished by offering a measured amount of mineral every two weeks. Because most minerals can be stored in the body for short periods of time, it is perfectly acceptable for mineral feeders to be empty during the final few days of the two-week feeding interval. This feeding strategy helps prevent over-consumption and increased annual mineral costs per cow.

### **Mineral Feeding (hypothetical example):**

Label recommends 2 ounces of mineral per head per day

100 cow herd

Provide mineral every 14 days

2 ounces x 100 head x 14 days = 2800 ounces (or 175 lb) twice monthly

Organic trace minerals will not be cost effective for every situation. However, as production practices continue to become more focused on efficiency and overall performance, advances in trace mineral supplementation may offer valuable tools to include in our management strategies. **(JA)**

### **- Tropical Soda Apple Control Following a Freeze -**

Research has demonstrated that spraying Tropical Soda Apple (TSA) regrowth 60 days after a freeze can eliminate a mowing treatment (saving \$10 to 15/A) and provide excellent TSA control. Applying Remedy<sup>®</sup> at 1.0 lb/A plus a silicone surfactant at 6 oz/100 gal water to TSA regrowth after a freeze provided 90 to 97% TSA control. Remember, this will not eliminate TSA because the many yellow fruits on the soil surface contain 400 to 500 seeds each. Therefore, a second herbicide treatment will need to be applied 60 days after the initial application in late May, using the same above rate. For additional information call P. Mislevy at 863-735-1314. **(PM)**

## Featured Ranchers: - Hay Field Day at McClure Farm



Most Florida beef cattle producers have to store excess forage produced during the peak of the growing season in order to have feed when production ceases in winter. The alternative is to purchase feed or hay produced elsewhere. Warm season grasses are normally stored as hay, a 12 to 15 percent-moisture material baled in rectangular or round bales; or haylage, a 50 to 70 percent-moisture partially fermented material stored under anaerobic (oxygen-free) conditions. It is estimated that about 250,000 acres of hay are annually harvested in Florida.

Last October, the South Florida Beef and Forage Extension Group organized a Hay Production Program at the Manatee Extension Office to discuss various aspects of hay-making. This was followed by a visit to McClure Hay Farm on Moccasin Wallow Road in Parrish.

Emerging from the discussion at the County Office, key factors that control the amount and quality of hay produced on your land during the growing season are 1) the stage of maturity when the grass is cut for hay, 2) the type of warm season grass grown for hay, 3) your hay-crop fertilizer program, 4) your harvesting, drying and storage methods, and 5) your hay feeding program.

Warm season grasses are well known to lose quality rapidly with maturity. To obtain good quality hay, these grasses must be cut every 4 to 6 weeks and dried to about 15% moisture as quickly as possible. In central Florida, perennial grasses such as stargrass (Florona or Ona), bermudagrass (Florakirk or Tifton 85), Pangola digitgrass, Floralta limpograss and Callide rhodesgrass produce more high quality forage than bahiagrass when cut at the proper stage of maturity. The grass cultivar selected should produce about 1.5 tons/A of dry matter yield per harvest or 6 tons/A/year including an early spring crop (March-May), 3 to 4 summer to early fall crops and a late fall (November-December) crop. The grass cultivar should also be persistent when frequently mowed. The final hay product should have a good green color, a pleasing aroma, void of weeds, debris and mold. Hay grass cultivars must produce good quality forage with 53 to 60 % IVOMD ( $TDN = 0.94 (26.8 + 0.595 \times IVOMD)$ ) and 10 to 14% crude protein (CP). To ensure best cattle utilization and performance, the hay should have a TDN/CP ratio of about 6. Hay that deviates markedly from this optimum TDN/CP ratio will require either energy or crude protein supplement as an extra expense during feeding time. The fertilizer formula used for a hay crop can be adjusted to sustain yield and achieve the desired TDN/CP balance. For example, Floralta limpograss normally has a high TDN but low CP relative to other warm season grasses and would require a concentrated N mixed fertilizer, preferably in liquid formulation, to promote both foliar and root absorption.

Hot, humid weather with frequent rain occurs during peak summer grass growth, making hay production difficult. An essential requirement of a hay grass cultivar is fast drying. When weather conditions permit, the grass needs be harvested one day, dried and baled the next day. A roller-conditioner system will improve drying time over the standard mower but the use of a flail conditioning system is even better. Regardless of the mechanical hay conditioning system used, there are major differences in the drying speed of grasses. Crops with large stems such as Floralta limpogross take several days longer to dry compared with fine stemmed grasses such as Florakirk and Florona. After baling, hay should be protected from the elements of weather to avoid losses. Hay may be stored in barns or under plastic covers. Feed hay in some type of feeder that restricts animal access so feeding losses are reduced.

Another forage conservation technology that has been developed to overcome the adverse humid summer conditions is the plastic wrapper for round bale silage or the plastic tube for chopped silage. The wrapper or tube method makes it possible to harvest and store forage immediately after cutting or up to 4 hours of wilting in the field. Round bales are separately wrapped tightly and chopped material tightly packed to exclude air. Several hay wrapping machines and plastic materials are available on the market. The plastic you select should be strong to resist punctures from stubble, rocks, etc., and withstand ultraviolet radiation (sun) without disintegrating. The white plastics film reflects sun rays and prevent overheating (110+ °F) during fermentation.

A hay wrapper machine was exhibited by Rite-Away company from Samson, Alabama to demonstrate the updated hay wrapping process. Additionally, Mr. Clay Newsome, the Hay and Livestock Production Manager of the farm, and Mr. McClure, the owner of McClure's West Coast Tomato and Hay Operations, were both around to provide a first class educational tour. Hay crop is rotated with tomato crop (5-year rotation) and each crop follows all IFAS recommendations on establishment, cultural practices, harvesting and storage regimes to the letter. No wonder the McClures have succeeded in developing more than 1,000 acres to stargrasses (Ona & Florona), Florakirk bermudagrass and Floralta limpogross in just 3 years and are winning over a lot of beef, dairy and horse owners with their high quality hay. We salute Mr. McClure and Mr. Clay Newsome for their foresight and for hosting the field day participants. **(MBA)**



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