AGRONOMY NOTES

UNIVERSITY OF FLORIDA
IFAS EXTENSION

December, 2003

DATES TO REMEMBER

Feb. 24-25, 2004	FL Weed Science Society Annual Meeting, Ft. Pierce
May 22, 2004	4th Annual Perennial Peanut Field Day, Moultrie, GA
May 27, 2004	Corn Silage Field Day, Citra

IN THIS ISSUE

Hay Feeding Losses

This is the time of year when we need to be concerned about hay feeding losses. This is especially true when feeding large round bales that have not only been stored outside (where considerable weathering loss has occurred), but will also be fed outside on the ground. Feeding losses can occur with any feeding system; the objective should be to minimize the loss so that animals can consume most of the hay given to them.

Most large hay packages are fed on sod and offers the advantage of distributing hay on pasture land rather than concentrating it along a feed bunk or in a barn. When hay is fed on sod, livestock usually waste and refuse less hay in situations in which they have a solid footing. Dry, well-drained, sites should therefore be chosen for feeding hay outside.

Feeding in only one area permits selection of a convenient feeding location which is easily accessible and which minimizes the size of the area in which sod is killed. However, it causes excessive sod destruction, may create muddy conditions, often results in heavy spring weed pressure, and can result in soil compaction and/or ruts in the pasture.

Some livestock producers who feed in only one area prefer to feed on concrete or to haul in large gravel so the hay can be placed on a solid foundation. Also, some producers feed the lowest quality hay first, thus initially causing excessive hay wastage but providing a foundation for further feeding.

Frequently moving the feeding area allows manure to be spread more uniformly over the pasture(s) and therefore improves the soil fertility in bare or thin spots, while reducing the severity (though not necessarily the total area) of sod damage.

When hay is fed on sod, the amount of hay wasted will be much less when only a one-day hay supply is given, and when hay is fed in such a manner that all animals have access. However, unrestricted animal access to large round bales or stacks will result in grossly excessive feeding waste.

If substantial quantities of hay must be put out at one time, erecting a barrier between the hay and the feeding animals will reduce waste. The barrier can be an electric wire, feeding racks or rings, panels, wagons or gates. Feeding racks and rings are available in a variety of shapes and sizes. Racks which prevent hay from contacting the ground are particularly effective.

When racks or panels are not used, enough animals are needed to eat the amount of hay offered in a relatively short period of time. Waste can be reduced by having at least one cow for each foot of outside dimension (circumference) of the hay package. (Source: Don Ball et.al. in Minimizing Losses in Hay Storage and Feeding).

CGC

Judging Hay Quality

Most of the hay fed to beef cattle in Florida is bermudagrass, bahia, or some other warm season perennial grass. Alfalfa and other temperate forages are often purchased and fed to horses. If a laboratory test is not available that gives protein and digestibility values, one can get some idea of the feeding value by "sensory" examination of the hay.

First determining the plant species in the hay can be helpful. Does one species tend to be higher in quality than the other. If the hay is pure perennial peanut, it is likely to be more digestible, more palatable, and have a higher protein content than a hay that is 50% peanut and 50% common bermudagrass. Mixed bermudagrass and bahia may have a nutritional value equal to a pure bermudagrass hay, but may be discounted by the buyer because of the difference in color of the two grasses in the hay.

Maturity of the plants at the time they are cut to make hay is the most important factor in determining hay quality. If you know when the previous cutting was made then you can determine the age of the hay crop. This can be

very helpful with bermudagrass or bahiagrass hay. Temperate grasses (timothy and others) produce seed heads as they mature and therefore the presence of seed heads in the hay is an indication of advanced maturity and perhaps lower quality, but the warm season grasses do not always produce seed heads before they are overly mature.
Examining the texture of the hay can be useful in determining maturity. Plant stems that are soft and pliable indicates young immature plants. As the plant matures the stems become more lignified and therefore stiffness of the stem increases. Are the stems stiff or even brittle?

Texture of the hay can be an important clue to maturity and forage quality. Very young immature hay is soft and pliable and stems are hardly distinguishable from leaves. Hays can range from very soft to harsh and brittle. Leaf content and moisture level at baling can also affect texture.

Leaf content affects hay quality. The higher the leaf content, the higher the forage quality. Plant species, maturity at harvest, and handling of the hay that results in leaf loss affect leafiness of the hay. The producer must be especially careful when tedding, raking and baling legumes hays in order to avoid excessive leaf loss.

Color is the first thing many buyers consider when purchasing hay. Color may or may not be a good indicator of forage quality. A bright green or light green color indicates that hay was dried quickly and stored under a cover. A hay crop will lose color when rained on, which may be due to leaching and mold or fungal growth. Prolonged exposure to sunlight will bleach hay. Baling at a moisture content of 20% or greater may result in heating and internal browning in the hay bale.

Smell the hay. A pleasant odor indicates hay was cured properly. Moldy, musty odors may occur in hay stored at moisture contents greater than 15%. Such odors may reduce intake by the animal. A caramelized odor is caused by heating to temperatures greater than 125 degrees F. Heating occurs when hay is baled at too high a moisture content. Is the hay **dusty**? Dust usually results from soil being thrown into the hay as it is raked. Excessive mold or mold spores may appear as a dust when the hay bale is fed.

Look for weeds. Often weeds do not dry completely and may cause localized molding. How much weed content is there in the hay? Does the weed have any nutritional value? Is it toxic? Coffee senna in a bale of alyceclover hay would be a serious problem.

Look for trash. Tree leaves, cow dung, plastic, aluminum cans, sticks and dead snakes are undesirable.

CGC

Frosted Pastures May Bring Problems

Over the past few years I have seen or heard reports of cattle eating coffee weed soon after a frost. Cattle producers should be aware of this potential problem and mow these poisonous plants before frost occurs. Animals may not have grazed coffee weed all year but may start grazing them after a frost.

CGC

Coffee Weed

A publication SP 57, "Poisonous Plants of the Southeastern United States" is available from the University of Florida Institute of Food and Agricultural Sciences for the cost of $4.00.

Recently, there have been reports of animal deaths from eating coffee weed. There are two plants commonly called coffee weed that can cause a problem; these are sicklepod (*Senna obtusifolia)* and coffee senna (*Cassia occidentalis).*

The following comes from the older book entitled "Poisonous Plants of the Southern United States": Both plants are summer annuals. Coffee senna is very similar to sicklepod but has mostly 8 or more leaflets rather than 4 to 6. The pods on coffee senna are flattened while those of sickle pod are nearly

four-sided. Also, coffee senna pods tend to be straighter and shorter than those of sicklepod. [The end of leaflets of coffee senna are pointed whereas those of sicklepod tend to be rounded]. These plants are found throughout the south but are more abundant on sandy soils of the coastal plain, and are most abundant in cultivated fields, roadsides, waste places and open pinelands.

Toxicity: The toxic principles have not been clearly established. The seeds appear to exert their toxicity upon the skeletal muscles, kidney, and liver. The leaves and stem also contain toxin, whether green or dry. Sicklepod is much more prevalent but somewhat less toxic than coffee senna. Animals can be poisoned by consuming the plant in the field, in green chop, in hay or if the seed is mixed in grain. Toxicity has been observed in cattle. It should be assumed that other animals are susceptible to the effects of these plants.

Symptoms: Diarrhea is usually the first symptom observed. Later, the animals go off feed, appear lethargic, and tremors appear in the hind legs, indicating muscle degeneration. As the muscle degeneration progresses, the urine becomes dark and coffee-colored and the animal becomes recumbent and is unable to rise. Death often occurs within 12 hours after the animal goes down. There is no fever.

Treatment: Once animals become recumbent, treatment is usually ineffective. Selenium and Vitamin E injections have been used with variable results.

CGC

Frosted Sorghums

Sorghums, sudangrass, and johnsongrass will produce prussic acid after a frost or freeze. The frosted forage will produce large quantities of prussic acid when the plant cells break down in the cow's rumen. This may cause prussic acid (HCN) poisoning. If the forage is allowed to dry for 3 to 6 days it should be safe to consume. As the plants dry, the toxic compound will be released to the atmosphere as a gas. In the fall, remove animals from these pastures when frost is eminent. [Pearl millet does not produce prussic acid.]

Also do not allow animals to graze young regrowth that may appear in south Florida after the tops have been killed by a frost. At any time during the growing season, always allow these plants to reach a height of 18 to 24 inches before grazing since the young plants have a higher concentration of prussic acid, frost or no frost, and can be dangerous.

Frosted sorghums can be harvested for silage. The danger of prussic acid poisoning is minimized since the forage is chopped coming out of the field and then handled again when taken out of the silo. This provides ample opportunity for the toxin to escape to the atmosphere. A light frost may even be helpful if sorghum is harvested for silage since it will allow the plant to dry down. The forage sorghums often contain too high a level of moisture when harvested direct (without wilting) for silage.

Sorghums and other warm season annual grasses that have received moderate to high rates of nitrogen fertilizer and have been under drought stress may contain toxic levels of nitrates. If levels are high enough, nitrate poisoning can occur. Drying or harvesting the plants for silage does get rid of the nitrate. In some situations, the potential for nitrate poisoning may be greater than for prussic acid poisoning.

CGC

Castor Bean

Castor beans can sometimes be found in a pasture. Yes, castor bean is poisonous. Castor bean is a perennial in the tropics and subtropics, but acts as an annual in much of the south (where frost occurs). Found throughout the Southeast; it is sometimes cultivated, occasionally escapes and persists in pinelands, waste places, and roadsides. I have seen it growing in South Florida along roadsides and on mounds of topsoil stockpiled by the highway department.

Toxicity: The poisonous principle is a phytotoxin called ricin. In the Southeast the plant is commonly planted not only as an ornamental but also in vegetable gardens to repel moles. Horses are most susceptible to poisoning, but all livestock and humans can be affected. All parts of the plant are toxic, especially the seeds. Toxicity is seen most often in spring and summer.

Control: Mowing of very large plants may provide all of the control that is needed especially in the fall. If only a few plants are present and if they are carrying seed, removal by hand will prevent the spreading of seed. In the spring as seed germinates and new plants develop, commonly used pasture herbicides will likely control small plants.

CGC

Grass Tetany in Cattle

Grass tetany sometimes called grass staggers or hypomagnesemia, can be a serious problem in Florida with cattle grazing small grain or ryegrass pastures. The problem is usually confined to lactating cows. The exact cause of the disease is unknown, although it is always associated with an imbalance in the mineral components of blood serum, especially reduced magnesium levels. In Florida, the disease is more severe when cattle are grazing young forage, particularly the first flush of growth during December and January. Once the forage becomes more mature, the likelihood of problems occurring is reduced. The disease is apt to appear under conditions of nutritional stress. Placing cattle on winter pasture directly after being on frosted or other low quality pasture may cause such a nutritional stress.

The **symptoms** of hypomagnesemia closely resemble those of milk fever or ketosis. These include nervousness, lack of coordination, muscular spasms, staggering and death. When the disease is suspected, a veterinarian should be called immediately to diagnose and to initiate treatment. However, in beef herds, the herdsman does not always have the opportunity to observe the signs of the disease and affected cattle may be found dead in the pasture.

Factors which have been associated with this disease include low levels of magnesium (Mg) and high protein and potassium levels in the forage. Use dolomitic limestone, which contains magnesium, to increase forage magnesium levels if the level of soil magnesium is low. On soils with a high pH level, magnesium can be included with fertilizer materials. Excess nitrogen in conjunction with high levels of potassium fertilization tends to reduce the magnesium level in most forage plants. Consequently, these fertilizer elements should not be applied in excess on temporary winter pastures. Follow recommendations based on soil test results.

Grass tetany can be **prevented** by feeding mineral supplements that contain magnesium. Commercial mineral mixtures containing 10-15% magnesium are available for feeding during periods of increased grass tetany probability. Cattle need to consume 6-12 ounces/head/day of this mineral. (For additional information on this problem, see the publication Agronomy Facts SS-AGR-64 “Grass Tetany in Cattle”).

CGC

Tobacco Varieties for 2004

Many of the older varieties that have been grown in Florida continued to produce excellent yields and quality in the 2003 variety trials at Live Oak. K 326, NC 55, NC 71, NC 72, NC 297, and Speight 168 were among the better entries in the test . Black shank was not present at this location. A new variety, NC 291, performed well in this test as well as in other states. NC 291 has high resistance to black shank and also has resistance to potato virus-Y and tobacco etch virus. RS 1410, another variety new for 2003, also performed well. NC 102 will be available for the first time in 2004 and may be of interest to some Florida growers. This variety has high resistance to black shank and is resistant to tobacco mosaic virus. It has resistance to some strains of potato virus-Y and tobacco etch virus. It should have less stunting from cucumber mosaic virus than other varieties

although the leaf mosaic symptoms will still be present. Other new varieties include NC 299, NC 810, and Speight 210. These varieties also have high resistance to black shank.

EBW

Tobacco Quota for 2004

The USDA will announce the 2004 flue-cured tobacco quota by December 15, 2003. The quota will be determined by three major components. The first is the buying intentions of the domestic manufacturers. They will report their intentions by December 1. A second component is the recent 3-year average export level. The third component is determined by the amount of tobacco in the loan program. Although the amount of tobacco sold at auction is only a fraction of that contracted, over 70 percent of non-contracted tobacco went into the loan program. Unless there are substantial sales of loan tobacco before December 15, the amount of tobacco in loan could cause a reduction in the quota. Finally, the Secretary of Agriculture can increase or decrease the calculated quota by as much as 3 percent. Most predictions are for about a 15 percent reduction of quota for 2004 as compared to 2003.

EBW

Checking Tobacco Barns

The winter is a good time to test tobacco barns for possible leaks in the heat exchanger. This can be done by use of a CO2 meter. If the CO2 level in the barn increases when the burner comes on, then it is possible that a crack has developed in the heat exchanger. There is no problem with increased levels of CO2 in the barn, but is used as an indicator of nitrogen gases that are also released during fuel combustion. The nitrogen gases can react with the tobacco to form nitrosamines, which is undesirable. There are no inexpensive and effective meters to measure the nitrogen compounds, so the CO2 measurements are used. A CO2 meter is available for county agents to use to check barns.

EBW

Bahiagrass Rotation

Peanut yields after 2 years of bahiagrass were 50% higher than peanuts after two years of cotton in 2003. We have known for many years that bahiagrass makes a good rotation for many crops and reduces nematodes. Recent research at the NFREC shows higher water infiltration, higher soil water content down to 18 inches, and better rooting depth of cotton grown after peanut which was planted after bahiagrass than on cotton grown after cotton which was planted after peanut with no bahiagrass in the rotation. These data indicate less need for irrigation and better soil quality, less runoff and the possibility of increasing soil organic matter from larger root systems and top growth occurring in the bahiagrass system. A business model of this system can be found at http://nfrec.ifas.ufl.edu/sodrotation/sodrotation.htm . This model is interactive and actual numbers from individual farms can be used to determine the profit of different proportions of crops and livestock.

DLW

Deep Tillage in Continuous Row Crops

A common question asked by growers is “how deep is deep enough for the deep tillage operation to break the compaction layer and obtain maximum benefit to crop yield”. We have several years of research that shows that ripping under the row of non irrigated corn can result in yield increases of as much as 50 bu/A and 15 bu/A for soybeans. It was noted on soybeans that when soils were ripped under the row highest yields occurred as compared with ripping different distances from the row. Wheat yields have also been increased by 15 bu/A by chisel plowing to a depth of 10 inches or deep turning 10-12” deep as compared to harrowing. Soils are normally compacted from a depth of 6“ to about 14” in typical fields in Florida. Fields that have had winter grazing and have been grazed over the winter when soils are typically wet will have surface compaction in the top 3-4” too. Therefore, to break the compaction layer,

we must do tillage operations down to a depth of at least 14". Several years of research with a paratill implement, which goes to a depth of about 18 inches, show that it breaks through the compaction layer. However, when compared to strip tillage, which usually goes to a maximum depth of 12", no yield advantage was found to the deeper tillage. When both paratilling and ripping under the row were done together in the same plot of land, paratill first followed by ripping under the row at planting, no yield advantage was found above ripping under the row alone. This occurs even when ripping under the row does not completely break through the compaction layer. With irrigated corn, no yield increase was noted to in row deep tillage as compared to using a harrow. This indicates that the compaction layer is not a problem for crops if water and nutrients are applied on a timely basis and meets all plant needs in a more shallow root system. However, due to irrigation systems breaking down during periods of highest need, it is still advisable to rip under the row to increase rooting depth. The standard practices of chisel plowing or turning or ripping under the row with a subsoiler appear to give just as good of results as using tillage implements that will go 6-8" deeper (18" total depth). Other good practices of rotation and fertility management are necessary to aid the practice of subsoiling under the row at planting to obtain consistently good yields.

DLW

November Crop Report

The National Agricultural Statistics Service estimated in November that the United States would set a new record for corn yield per acre and for total production in 2003. The average corn yield estimate was increased from the October estimate and stands at 143.2 bushels per acre. The previous records for yield per acre and total production was set in 1994. Soybean estimates for November were lowered and production is estimated to be 11 percent below 2002 and the lowest since 1996. Cotton production was estimated to be 6 percent above last year, and the estimated yield per acre of 722 pounds would be a record. Peanut yields for the United States are estimated to be 3205 pounds per acre which would be a new record. The Florida average yield estimate for peanuts is 3000 pounds per acre. The average sugarcane yield for Florida was estimated at 40 tons per acre, while the US average was estimated to be 36.2 tons.

EBW

NEW Publications

SS-AGR-195	Sugarcane Variety Census: Florida 1998
SS-AGR-196	Sugarcane Variety Census: Florida 1999
SS-AGR-197	Sugarcane Variety Census: Florida 2000
SS-AGR-198	Sugarcane Variety Census: Florida 2001

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