AGRONOMY NOTES

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DATES TO REMEMBER

October 3rd - Perennial Peanut Field Day, Marianna, FL.
October 11th – Weed Control Field Day, Ona, FL.

IN THIS ISSUE

Cotton Defoliation Problems in 2006

Cotton began to cutout early in many fields across Florida this year. Some of this was due to higher heat units experienced during the growing season and hastened maturity. However, dry weather was the culprit in many cases.

Early cutout was also caused by Cercospora, Alternaria, and Stemphylium leaf diseases in some fields. These diseases are often seen when the plant is under stress. Cotton was under moisture stress most of the season which resulted in potassium deficiency was common. Soil samples in these fields may have shown adequate potassium, but leaf samples showed deficiencies. These deficiencies start showing up when high demand coincides with slower root growth.

David Wright

Defoliating Cotton

The updated cotton defoliation guide can be found at http://edis.ifas.ufl.edu/AG188 .

Cotton fruit development in late September will often not result in any additional cotton yield. In most cases, blooms in July and early August will make 90% of the cotton yield or more. Bolls set in mid-summer are usually larger and mature in 40 to 50 days, while bolls set in August can take 60 days or longer to mature. Late flowers look attractive and may give the appearance of adding to the final yield of the crop, but should not be given preference over the fruit that was set during the first 3 to 4 weeks of bloom. Therefore, our experience is that September blooms contribute little to yield.

There are several ways to determine when to defoliate cotton. An old rule of thumb is to defoliate when 60% of the bolls are open. Another method is nodes above cracked bolls (NACB). Research has shown that cotton with four nodes above the highest cracked boll can be defoliated without significant weight or quality loss. If NACB counts average five or more, defoliant applications should be delayed.

David Wright

Herbicide Resistance

The National Cotton Council has recently developed a weed resistance on-line learning module. This program can be accessed through http://www.cotton.org/tech/pest/wrm/.

This is a very good program that contains a great deal of information about herbicides and weed resistance. There are four parts that to this module: herbicide mode of action, herbicide resistance, do I have resistance, and herbicide resistance management. I would encourage everyone to take time to view one or all of these modules. This was developed to help educate producers and agriculture managers and help everyone stay one-step ahead of these new and developing resistance issues.

Jason Ferrell

Cimarron® is replaced by Cimarron Plus®

Florida hay producers used Ally Herbicide for many years to control 'Pensacola' bahiagrass in bermudagrass. However, approximately 2 years ago DuPont decided to change the product name from Ally to Cimarron. The product was still metsulfuron-methyl (60%) and everything remained the same; the only difference was the new name.

Since then, DuPont has decided to phase out Cimarron. This herbicide will be replaced with Cimarron Plus. Cimarron Plus has two active ingredients: metsulfuron-methyl

(48%) and chlorsulfuron (15%). Considering that the amount of metsulfuron-methyl per ounce of material has been reduced from 60% to 48%, it will now be necessary to convert old Cimarron use rates to the new Cimarron Plus rates. This can be done by multiplying the Cimarron rates by 1.25. For example, if you wish to control 'Pensacola' bahiagrass and you have traditionally used Cimarron at 0.3 oz/A, you will now need to use Cimarron Plus at 0.375 oz/A.

It is currently unknown what additional weeds will be controlled by the addition of chlorsulfuron. However, Cimarron Plus is safe for use on bermudagrass hay fields and has a 0 day restriction for grazing and haying.

Jason Ferrell

Vista Herbicide for Pastures

Vista is not a new product, but has been sold exclusively for vegetation management on rights-of-ways. Recently, this herbicide was approved for use in pastures through a supplemental label. Vista contains fluroxypyr, which is also a component of Pasturegard (triclopyr + fluroxypyr). We have been happy with the results of Pasturegard over the past couple of years. So, why has Vista been approved for use in Florida? At this point in time, I do not believe that Vista will be a stand-alone product for weed control in pastures. However, it can be a good option for tank-mix partners for hard to control weeds.

The supplemental label for Vista was seen as an opportunity to increase the weed spectrum of Milestone and Forefront; two herbicides recently labeled for tropical soda apple control in pastures. Milestone is known to be weak on large dogfennel, but it was thought the addition of 2,4-D to aminopyralid (Forefront) would overcome this issue. However, recent complaints have shown that large dogfennel were not controlled with Forefront. Therefore, a test plot was established to examine potential tank-mix partners for Forefront to control dogfennel with one application. The dogfennel were approximately 40 inches tall at the time of application. It was found that the addition of as little as 8 fl oz/acre of Vista to 2 pints/acre of Forefront provided >90% dogfennel control 2 months after treatment (Figure 1). Control with Forefront alone at 2 and 2.6 pints per acre resulted in 61 and 66% control, respectively. The cost of Vista is approximately \$90/gallon. So, the tank-mix of Forefront at 2 pt/acre (\$16) plus Vista at 8 fl oz/acre (\$6) would cost approximately \$22/acre for excellent dogfennel and TSA control.

Figure 1. Response of dogfennel 2 months after treatment with 2 pint/a Forefront + 8 fl oz/acre Vista.

Similar to Milestone, there are no grazing restrictions for Vista for beef or dairy cows. However, hay and silage should not be harvested for 7 days and meat animals should be removed from treated pastures at least 2 days before slaughter.

Brent Sellers

How Herbicides Work – Atazine

Atazine, which is also the common name, is one of oldest and most widely used herbicides. It was first registered for use in corn, but later registered in other grass crops such as sorghum and sugarcane. Atrazine can also be used in certain warm-season turfgrasses. Atrazine is generally applied pre-emergence to the soil, but can also be used postemergence on several weeds. This herbicide is very effective on broadleaf weeds and has fair to good activity on several grasses.

Atrazine is classified as a photosynthesis inhibitor and is a member of the triazine herbicide family – based on chemical structure. When atrazine is applied to the soil, it is taken up by the plant roots and moved upwards via the water stream. Thus, it is moved in the xylem tissues and gets into the leaf through the process of transpiration. Once inside the leaf, via the leaf veins, atrazine diffuses into cells and then into the chloroplasts of cells. Chloroplasts are those tiny dark green dots within the leaf cells as shown in figure 1; an expanded view in figure 2.

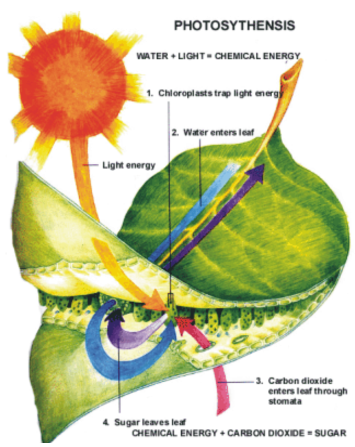
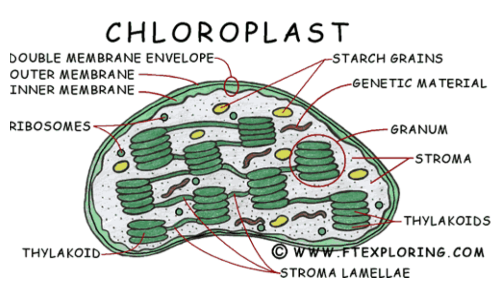


Figure 1. Adapted from:



www.caribbeanedu.com

Figure 2. Adapted from: www.ftexploring.com

Once inside the chloroplast, atrazine moves to the thylakoids, which are membranes within the chloroplast (Figure 2). Thylakoid membranes contain a series of complex proteins with figure 3 showing a cross-section of a thylakoid membrane. These proteins are embedded within the thylakoid membrane and function to direct the light energy captured by the chlorophyll molecules. This energy is captured in the form of electrons (e- in the figure below) which are passed through the proteins to form intermediates used for carbon fixation. Atrazine binds to a protein in photosystem II, thereby blocking the flow of electrons.

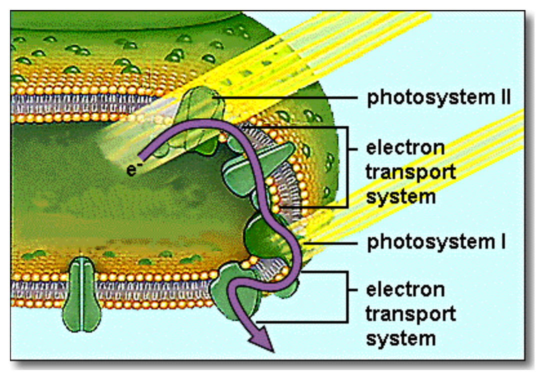


Figure 3. Adapted from: www.icb.ufmg.br

When this electron flow is blocked, intermediates are not formed and the plant cannot fix carbon. Without carbon, the plant cannot continue to grow and perform normal functions. In addition to blocking electron flow, another important problem arises within the chloroplast. Sunlight continues to shine and the chlorophyll molecules continue to absorb light energy. There are approximately 300 chlorophyll molecules feeding energy into each complex shown above in figure 3. With electron flow blocked by atrazine the chlorophyll molecules cannot release the energy absorbed from sunlight. Unable to dissipate energy, they self-destruct.

Atrazine can also be applied postemergence, over the top of both weeds and crops. It is absorbed by the leaves and diffuses into cells and then into the chloroplasts of cells. Basically, atrazine follows the same path as the arrow for sunlight as shown in figure 1. When atrazine is applied postemergence, it does not move within the plant and acts like a contact herbicide.

This cascade of events helps to explain the symptoms observed after applying atrazine. First, the plant begins to show yellowing of the leaves as the chlorophyll molecules disintegrate. Once the chlorophyll begins to destruct, oxygen radicals are formed. Then the chloroplast membranes are destroyed and eventually outer cell membranes become ruptured. This leads to necrotic tissue, taking on the appearance of a brown paper bag.

The images above show 2 types of injury observed with atrazine. The first image is injury symptoms from a carryover situation, where atrazine was used in the previous crop and there was sufficient residue to affect the soybean plant above. Notice the chlorotic (yellow) tissue. In the second image, the plants are dead from atrazine applied to the soil before emergence. As the plants emerged, the atrazine moved to the young leaves, causing rapid chlorosis and necrosis. Plants that are killed from atrazine in this manner are often called "mummies".

Atrazine has a moderate amount of persistence in many soils, but rarely causes a carryover problem in Florida due to our warm and humid climate.

Greg MacDonald

Small Grain and Forage Variety Information for 2006-2007

Information on ryegrass and small grain varieties for Florida and Georgia can be found at www.griffin.uga.edu/sevt .

David Wright

Asian Soybean Rust Update

Asian soybean rust (ASR) did not spread as fast in 2006 as we anticipated since infected kudzu survived throughout the winter in North Florida, Georgia, and Alabama. The reduced spread of ASR was mainly due to dry weather conditions from late February to late July. Tropical storm Ernesto swept through Florida and appeared as if it could carry the disease into the corn/soybean belt, but turned and hit the Carolinas which has seen higher infection levels on soybeans than most of the country.

Rust has been identified in many sentinel plots in Florida, but not in 100% of the plot areas. We have monitored these plots throughout the season and have watched the disease progress. Only a few of the early planted sentinel plots have been defoliated from the disease. We have not observed any commercial fields with high levels of infection to this point and it is probably too late to influence yield. Fungicides did an excellent job of controlling rust where we had early planting and relatively early infection on the research station. We would like to thank counties extension faculty who worked with us again this year on plots in their counties and it is also appreciated by farmers from the mid west watching where rust spread. Asian soybean rust has stayed in the south this year being found widely on both soybean and kudzu. Much research effort is being expended to find out about this disease and NFREC in Quincy has been the center for much of the work in the U.S.

David Wright and James Marois

Fall Soil Test

Soil tests taken immediately after harvest of crops in the fall can be used to determine fertility requirements as nematode levels to develop a plan of action for the coming year. If soil pH needs adjusting, fall is a good time of the year to apply needed lime since it takes several months to change pH. Most of the fertilizer should still be applied in the spring prior to planting the crop. Knowing nematode levels can also help growers to determine what crop should be planted in certain fields as well as what variety or nematicides should be used. This may make the difference between making a good yield and losing money on the crop.

David Wright

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