Mississippi Crop Situation

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This Weeks Planting Report

National Agricultures Statistics Services (Mississippi) Crop Progress for Week Ending 8/24/09

Crop	This Week	Last Week	Last Year	5- Year Average
Corn Dough	100	100	100	100
Corn Dent	99	98	99	98
Corn Mature	83	59	80	85
Corn Harvested	--	8	--	--
Cotton Setting Bolls	100	99	100	100
Cotton Open Bolls	8	3	11	30
Rice Headed	95	84	87	97
Rice Mature	14	6	22	38
Rice Harvested	0	0	1	3
Sorghum Coloring	94	76	86	96
Sorghum Mature	45	23	39	72
Sorghum Harvested	0	0	10	33
Soybeans Setting Pods	99	98	98	99
Soybeans Turning Color	35	26	37	62
Soybeans Dropping Leaves	15	7	14	42

Cotton Agronomics

Dr. Darrin Dodds

The late start that the 2009 cotton crop got off to is beginning to translate into a late finish. Examination of percent open bolls this week compared to the five year average reveals that only 8% of the crop had open bolls this week compared to a five-year average of 30%. In addition, average heat unit accumulation over the past five to seven days has been approximately 36% less than the previous several weeks in August. Generally, we continue to accumulate 16 to 18 heat units per day until mid-September after which time we typically see a 6 to 8 heat unit per day reduction. A reduction of this magnitude is inconsequential if it occurs for only a few days; however, over a period of two to three weeks this can significantly impact the crop maturation process. As we are headed towards fall and strive to harvest maximum yields, do not lose sight of the forest due to the trees. In other words, it is logical to wait as long as possible to make defoliation applications and begin harvest; however, do not sacrifice bolls on the bottom of the plant that will pay the bills for bolls on the top of the plant that may not.

Last week my newsletter article centered around fiber quality, and more specifically, fiber length and micronaire. Strength and uniformity will be covered this week. The dominant factor in determining strength of a given fiber is variety. Fiber strength is measured in grams per tex which is a measure of breaking strength in grams of one tex unit. A tex unit is the weight in grams of 1000 meters of fiber length. Environmental conditions, weathering, and excessive heating can have an impact on strength; however, not all of these impacts on fiber strength are well understood. In addition, severe potassium deficiency can reduce fiber strength by up to 2 grams/tex. Fiber strength is highly correlated to yarn strength. Additionally, fiber strength can impact the ability to withstand manufacturing processes as well as types of products that are manufactured from cotton.

Table 1. Strength classification.

Degree of Strength	HVI Strength (g/tex)
Very Strong	31+
Strong	29 – 30
Average	26 – 28
Intermediate	24 – 25
Weak	< 23

Length uniformity is a measure of the ratio of the mean length and the upper half mean length of the fibers. In other words this is a measure of the average length of all fibers to the average length of the longest fibers. If all fibers in a bale were the exact same length, fiber uniformity would be 100. Length uniformity is expressed as a percentage. However, unlike length or strength, uniformity index is only slightly influenced by variety. Variations in fiber length can exist among fibers that originate from the same seed due to each fiber strand elongating independently of each other. In addition, fiber length is impacted by ginning and cleaning processes. Length uniformity affects fiber evenness and strength as well as efficiency of the spinning process. Cotton that has weathered in the field and begun to deteriorate is subject to breakage during processing thereby decreasing the uniformity index. Also, bolls located on vegetative branches or those set late in the season may have increased short fiber content leading to a reduced uniformity index.

Table 2. Uniformity classification.

Degree of Uniformity	HVI Length Uniformity Index (%)
Very High	85+
High	83 – 85
Intermediate	80 – 82
Low	77 – 79
Very Low	< 77

Cotton Insects

Dr. Jeff Gore and Don Cook

Most of you are aware of the widespread resistance problems with plant bugs in the Delta regions of the state. Currently, pyrethroids provide little, if any, control of tarnished plant bugs. Similarly, control with the OP's has declined over the last few years despite increased rates. We recently conducted a test in Stoneville to investigate the use of an insecticide synergist for control of tarnished plant bugs in cotton. The synergist that we used is PBO (piperonyl butoxide). PBO works by tying up the enzymes that break down insecticides in the insect and has proven to be an effective way to temporarily overcome resistance problems in several species. The table below shows the results of the study we conducted with plant bugs. As you can see, the addition of PBO increased the level of control when added to either Acephate or Brigade and the combination of the two. This shows that addition of a synergist may provide some short term benefits to the current situation with tarnished plant bugs in Mississippi. More research is needed to determine the optimum benefits that PBO will provide. We currently have additional tests in Mississippi and other researchers across the mid-South will be conducting similar trials. Gus Lorenz in Arkansas and Scott Stewart in Tennessee have told me that they will be looking at the use of PBO in those states. At this time, it is not available locally, so it probably will not be an option this season. However, we will be trying to find a source before next season and will keep everyone updated.

Treatment	Rate/A	Nymphs/Drop (5 ft)
Acephate	0.5 lb ai	9.25
Acephate + PBO-8	0.5 lb ai + 4 oz	5.25
Brigade + PBO-8	6.4 oz + 4 oz	3.5
Brigade + Acephate + PBO	4 oz + 0.5 lb ai + 4 oz	1.75
Brigade	6.4 oz	14.75
Non-treated	---	32.0

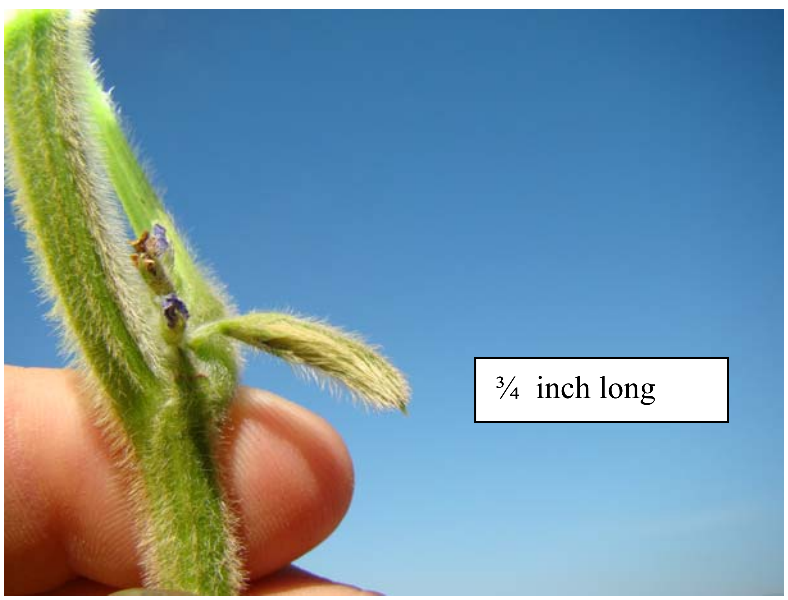
Soybean Agronomics

Dr. Trey Koger

Soybean Growth Stages: Late-reproductive growth stages: Much of the soybean crop in the state ranges in growth stages from R3 to R8, with the latest planted crop in the north 1/3 of the state and in areas where soybeans were replanted or planted behind flood waters. One of the most common questions we get is what growth state are my soybeans at?

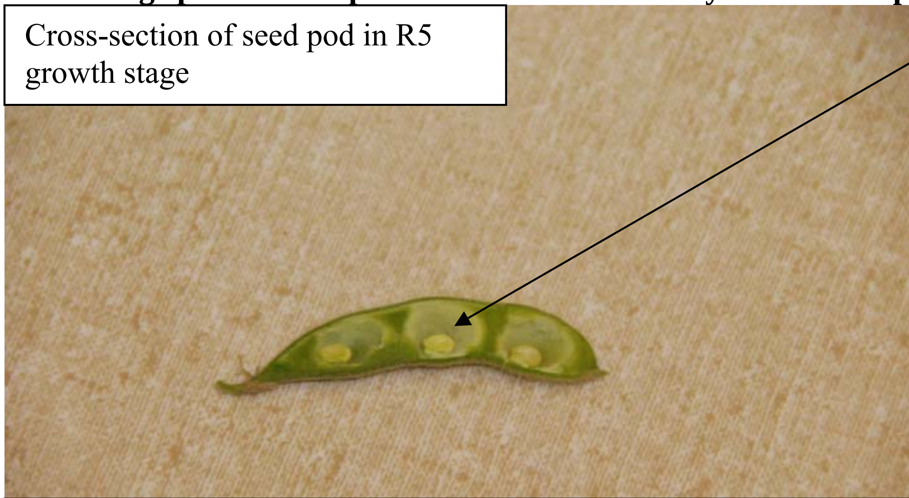
To determine the late reproductive growth stage of soybeans direct your attention to averaging the growth stage of all pods in the top four nodes of the plant. It is better to take an average of the top four nodes rather than going down to the fourth node from the top. Below, are a series of pictures of pods from R4 to R8 growth stages. It is important to determine the growth stage of your soybean crop for purposes of determining when to apply a fungicide, terminate irrigation, terminate sprays for soybean loopers, bean leaf beetles, and stinkbugs; as well as when to apply a harvest aid if needed.

R4: average pod size in the top four nodes is ¾ inch in length.



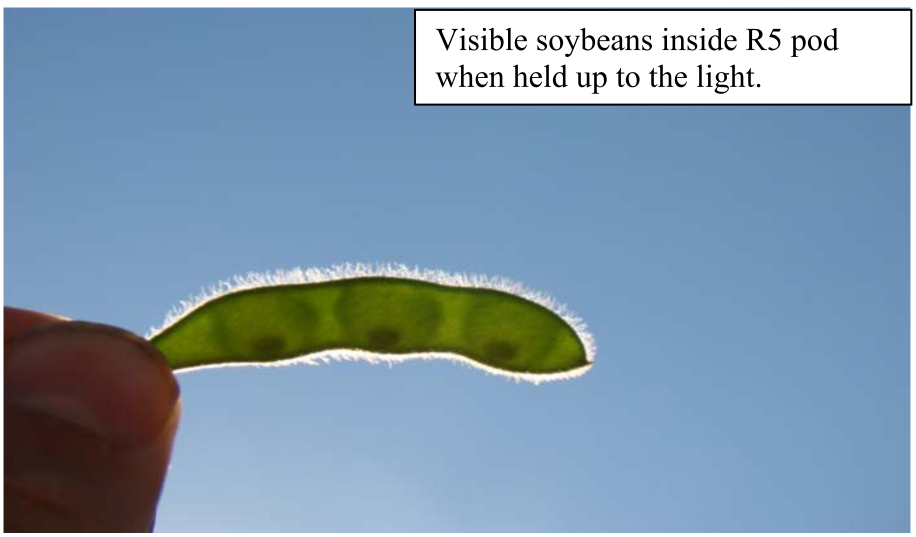
R5: average pod in the top four nodes has visible soybeans in the pod.

Cross-section of seed pod in R5 growth stage



Small seed inside seed pod

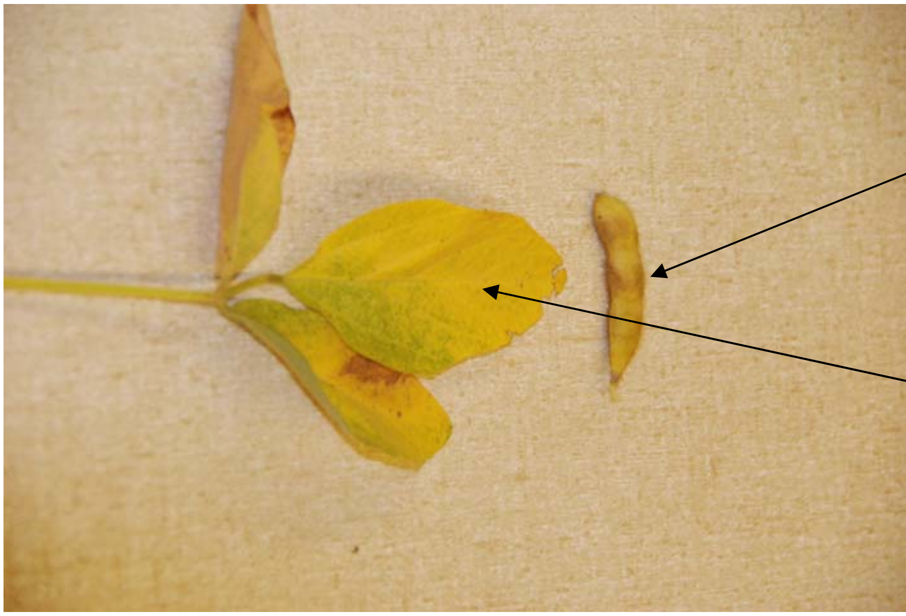
- Typically, with a late planted crop it takes approximately 21 days to go from initial R5 to beginning R6.



Visible soybeans inside R5 pod when held up to the light.

R6: average pod from top four nodes, beans inside pod fill up all the space within the pod.

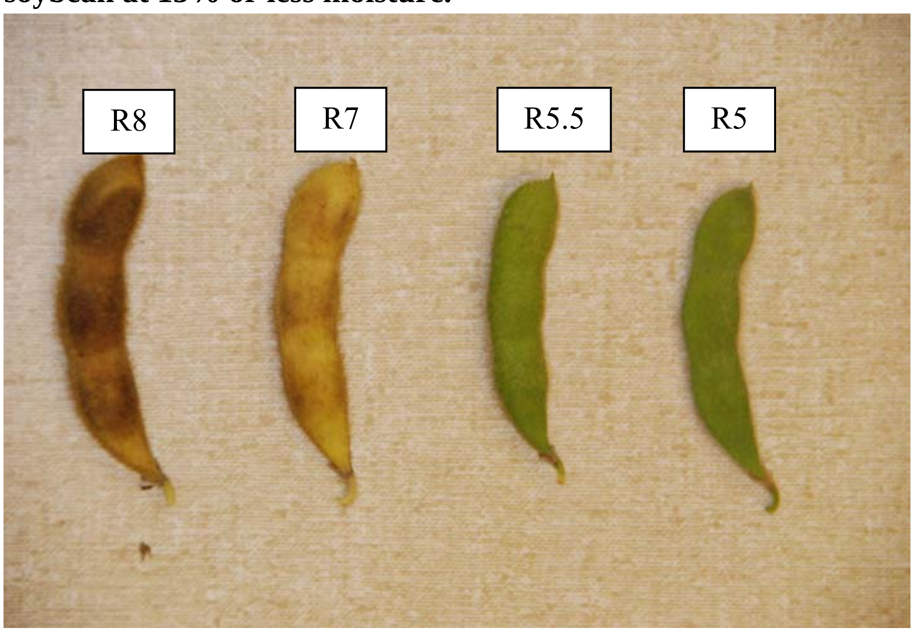
R7: one pod on the plant that has turned brown or mature color.



Seed pod in R7 growth stage that has turned to mature color

This is a leaf from the top of the plant. Leaves from bottom of the plant have likely begun to fall off, especially for indeterminate varieties.

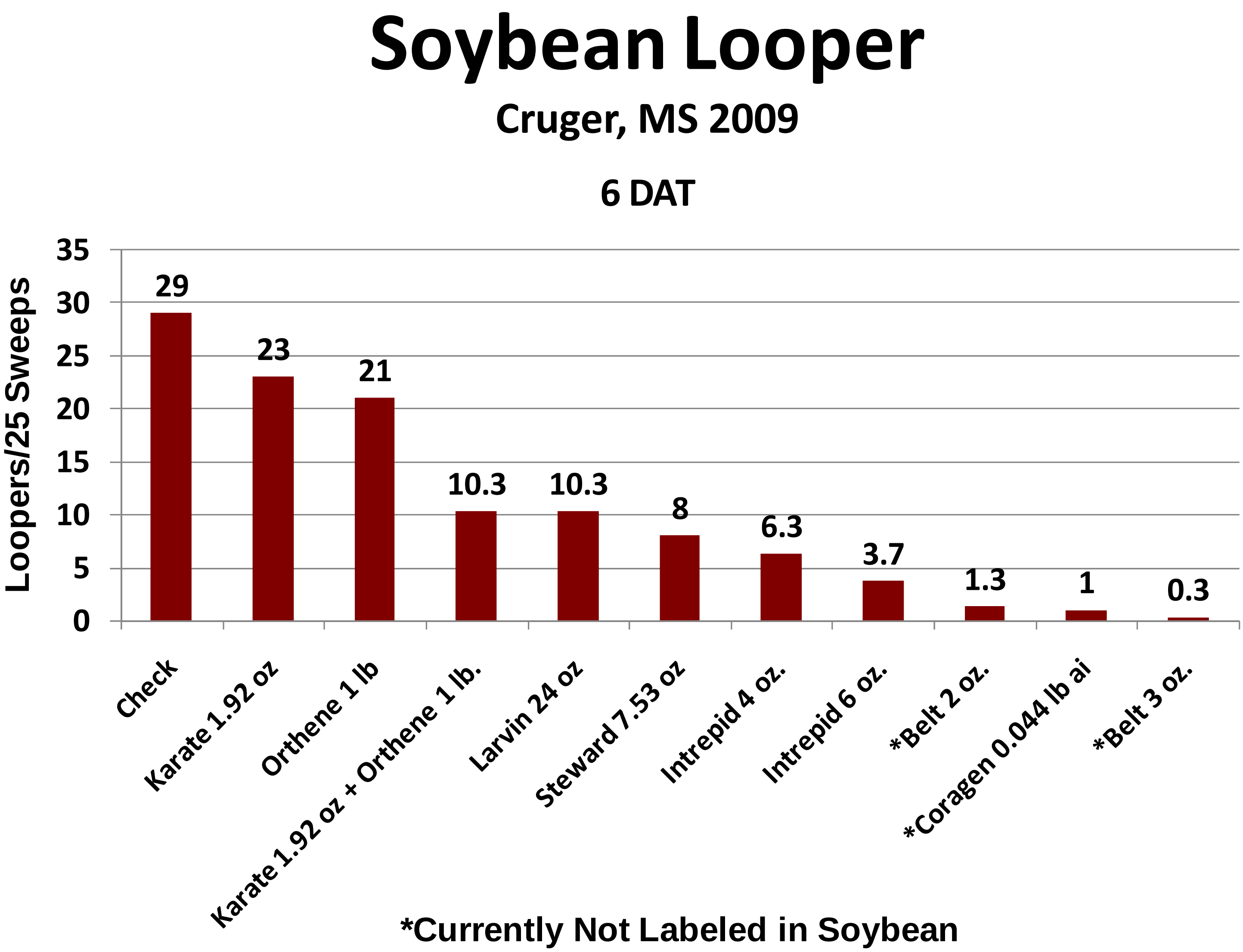
R8: Full maturity. Approximately 95% of pods will have reached mature color (grey, brown, to tan). Often only five to ten days of good drying weather after this state are required to have the soybean at 15% or less moisture.



Soybean Loopers

Dr. Angus L. Catchot Jr.

Soybean Loopers: Looper numbers continue to increase in areas of the delta. So far we have not seen any fields that are crashing from disease but we remain hopeful that pathogens will take some of these populations out with the cooler night time lows we have experienced. Below are results of a recent test we conducted in Cruger, MS. The data below are 6 days after treatment and were applied to beans that were nearly chest tall with a ground rig at 10 GPA. The results are somewhat surprising since we received **2 inches of rainfall 1.5 hours after application**. This goes to show that some of these compounds are extremely rain fast.

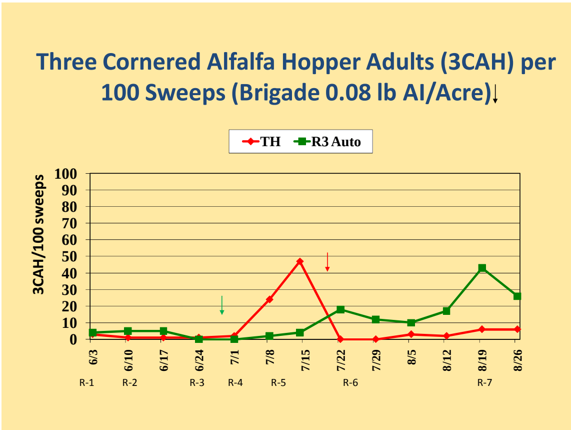


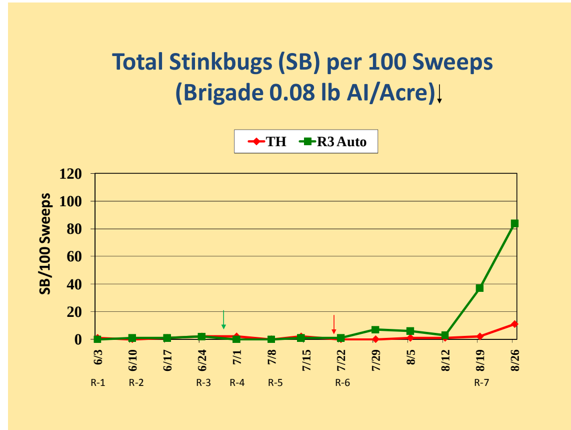
Soybean Insects

Dr. Gordon Andrews

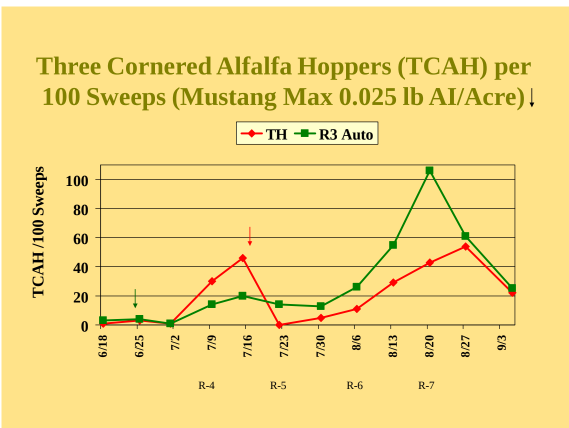
The graphs below show the populations of three cornered alfalfa hoppers (TCAH) and stinkbugs (SB) caught in sweep nets throughout the season in a test being conducted in the 2009 season. The objective of this test was to look at insect populations throughout the season and soybean yields produced by two soybean insect management strategies on production fields (over 25 acres). Strategy/treatment 1 requires no insecticide treatment until published thresholds are sampled from the fields except for (TCAH) which were treated at a lower threshold of 40 adults or 2 nymphs per 100 sweeps. Strategy/treatment 2 requires an application of insecticide at the R-3 stage of development and the use of published insect treatment thresholds for the remainder of the season. The test is being conducted near Cruger, MS on the same field as Test 2 was conducted in the 2008 season (See newsletter of June 19, 2009 http://msucares.com/newsletters/pests/cis/2009/mcs12-09.pdf). The treatments are on opposite sides of the field than they were in 2008. Hopefully we will get yields and grades on the beans in 2009.

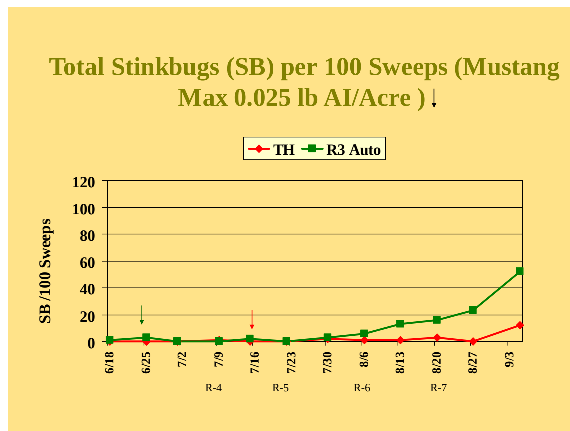
2009





2008





The message these graphs send is that insects are acting very similar from field to field and from year to year in our early group 4 beans. The R-3 application allows a lot more TCAH and SB activity in the field during pod fill and could lead to a second insecticide application when stinkbugs build up when the beans are at the R-6 and R-7 maturity stage. The one thing different about the stinkbug population this year is that over half the late season increase is red-banded stinkbugs while there were none in 2008 in any of the tests.

Corn Aflatoxin

Dr. Tom Allen

***Aspergillus flavus* in corn and corn aflatoxins:** Every year, during corn harvest, one of the single most important conversations I have has to do with aflatoxins. I'm usually reluctant to write something for the newsletter about them since I've often felt that this would cause a stir amongst grain elevators and producers alike. However, I'll try and spend a little time this year addressing some of the myths that I keep hearing about aflatoxins in our corn crop. Based on the information I have heard from consultants and producers this season it appears, at least at this point in the harvest, that aflatoxin contamination is not as widespread as last season. But with that said I have still heard some high numbers (> 100 parts per billion). Below I've also included a table (**Table 1**) for the acceptable levels of total aflatoxins in corn based on information from the Food and Drug Administration. In addition, there are specifications for feeding harvested corn to cattle as well as swine and poultry. However, if you think that corn on your farm has been contaminated with aflatoxins the safest thing to do is have it tested by the Mississippi State Chemical Lab. Corn samples can be submitted to the lab for testing but keep in mind that the cost is $40/sample. Instructions on sample submission can be found at http://www.mscl.msstate.edu/. Also, be mindful that the laboratory cannot screen for all mycotoxins and aflatoxins are only one of the toxins that we can encounter in corn.

Table 1. FDA guidelines for acceptable aflatoxin level in corn based on intended end use.

Intended end use	**Aflatoxin level in parts per billion (ppb)**
Milk (Dairy Feed)	None detected
Corn of unknown destination	< 20
Corn for young animals	< 20
Corn for dairy cattle	< 20
Corn for breeding beef (cattle, swine, and mature poultry)	< 100
Corn for finishing swine	< 200
Corn for finishing cattle	< 300

Elevators in MS will not receive corn with confirmed/tested aflatoxin levels greater than 20 parts per billion (ppb) due to interstate commerce laws. Aflatoxins themselves are incredibly potent toxins and are generally related to several human and animal health problems. In fact, long term exposure to aflatoxins, and most specifically the aflatoxin B1 the single most abundant aflatoxin, has been linked to cancer. Most importantly, as you read this piece please be aware that once aflatoxins are present in corn the overall concentration will not generally decrease nor will they disappear.

Generally speaking, alfatoxins are a group of mycotoxins that are produced by members of the fungal genus *Aspergillus*. In Mississippi it is generally recognized that the fungus *Aspergillus flavus* is the number one culprit in the production of these toxins in corn. Morphologically speaking the fungus will appear as an army green, or olive drab color on infected kernels (see photo at left with corn ear exposed). However, to correctly identify the fungus a corn ear exhibiting fungal mycelia needs to be sent to the diagnostic laboratory since there are several other fungi that can cause fungal ear rots that produce a blue to green color on the ear that include *Penicillium* and *Trichoderma*, neither of which produce a toxin in the developing grain. But at the field level these other fungi can easily be mistaken for *Aspergillus* since the easiest method to identify the particular fungus is by comparing spore morphology with a microscope. In addition, there are several other species of *Aspergillus* that can produce aflatoxins but they tend to produce the toxin in other crop substrates, most notably cotton seed, peanuts, and tree nuts (such as almonds and pistachios). But with that said, *A. flavus* can also produce aflatoxins in these crops.

The incidence of aflatoxins is highly dependent on the environment. Aflatoxin contamination has most normally been associated in corn and correlated with those years when hot dry summers occur. However, infection of the ear can also occur during periods of excessive rainfall. Generally speaking infection of the silks occurs under hot and humid conditions from spores that have developed from the fungus that has survived in the soil and on crop residue. Once spores land on the silks they can germinate if conducive conditions continue and the fungus will grow down the silk channels and colonize the ear. The fungus can infect uninjured kernels if the plant becomes stressed once the dough stage is reached. The most common factors associated with preharvest aflatoxin contamination are high temperatures (80-100°F) during grain fill.

In general, management schemes that limit plant stress can ultimately limit aflatoxin contamination. But, with that said, I oftentimes hear that irrigated corn will not develop aflatoxins. While it is more likely that irrigated corn will not endure as much stress as dryland corn during the season it is possible that aflatoxins can develop in irrigated corn since *A. flavus* is a common fungus in corn production areas but the level of infestation will vary. With the advent of Bt corn the incidence of aflatoxins in corn has decreased; however, the Bt genes inserted into corn only reduce insect feeding. Insects are not required for contamination/infection to occur, there are numerous additional avenues of entry for spores of *A. flavus* into the corn ear. Delayed or prolonged pollination can allow spores to land on the silks and wash down into the developing ear either on irrigation water (from a pivot), rainfall, or heavy dew. Additionally, anything that opens the ear to the potential of infection from *A. flavus* can increase the likelihood of aflatoxins resulting from fungal infection. This was one major reason why corn hybrids that exhibited a loose shuck in 2008 seemed to have a greater incidence of ears infected with *A. flavus* and the resulting aflatoxin.

Preharvest contamination of corn by *A. flavus* can also lead to a post-harvest/storage rot and thus increase the incidence of aflatoxin in harvested corn during storage. This is one major reason that I oftentimes find myself saying that if you are going to store your corn on the farm make sure that it is stored under conditions that maintain moisture under 15%. Aflatoxins are most readily produced when kernel moisture is below 32% and above 15%. However, with that said, I've heard a lot of people say that drying corn to a moisture content below 15% will do away with the aflatoxin. Once the aflatoxin is present it is <u>NOT</u> going away.

Now to spend a little time on some of the myths regarding aflatoxins specifically reducing aflatoxins post-harvest. Most of these are items that I've heard since I arrived at MSU and there is no research/data to support the statements.

1) Exposing the harvested grain to high temperatures will get rid of the aflatoxin. These temperatures are likely to prevent further development of the fungus in storage (by allowing it to become dormant) but once the aflatoxin is present in the grain it is not going to go away.

2) Storing harvested grain in one of the corn socks, sausage tubes (white plastic poly tubing on the ground) will do away with aflatoxins. Again, once present they will not go away and will likely increase since the fungus is either present or has been present and left spores on the harvested grain.

3) Parking the truck that the harvested grain has been hauled in and letting it "cool" for a period of time will reduce the level of aflatoxins in the load. Unless the corn has been cooled and dried before being placed in the truck this could only work to increase the level of fungal growth in the truck and likely lead to increasing the level of aflatoxin present in the corn.

4) Turn up the fans on the combine to blow the aflatoxin out the back. This practice will not remove the aflatoxin; however, this will likely limit broken or cracked kernels that might harbor the fungus and also remove any excess trash that can increase the likelihood of introducing moisture into the harvested corn and increase the chances of developing aflatoxin. But, try and minimize damage to the harvested corn to limit fungal infection of damaged kernels. Fungi tend to infect damaged kernels more readily than intact kernels.

Additionally there are a few important pieces of information to keep in mind. Aflatoxins can be produced post-harvest. This means that there are some storage considerations. Growth of the fungus can occur with a matter of days in a storage bin if the corn is not cooled and dried to the correct temperature and moisture (≤ 15%). Moreover, corn should be properly cleaned to limit the amount of trash and broken kernels present to limit the likelihood of either continued fungal growth or aflatoxin production as a result of the potential introduction of moisture on trash into the grain storage environment.

2009 Budworm/Bollworm Captures

Ryan Jackson USDA Trap line

August 24, 2009

County	This Week last Year Bollworm	Bollworm	This Week last Year Budworm	Budworm
Washington	117	36	23	10
Sharkey	142	120	0	12
Humphreys	145	23	11	0
Yazoo	36	97	11	4
Holmes	31	32	1	8
Leflore	72	44	4	22
Tallahatchie	157	61	9	14
Coahoma	151	148	5	21
Bolivar	197	170	0	23
Sunflower	99	167	30	34

Fred Musser Trap line

August 26, 2009

County	This Week last Year Bollworm	Bollworm	This Week last Year Budworm	Budworm
Grenada	43	14	1	0
Hinds	139	175	4	0
Madison	132	133	12	2
Rankin	137	32	17	3
Oktibbeha	19	200	0	2
Noxubee	5	15	0	6
Lowndes	59	56	12	4
Lee	125	107	3	1
Prentiss	144	58	12	0
Chickasaw	218	8	23	1
Calhoun	60	35	1	3
Webster	103	0	0	4

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