

Crop Insect Situation Newsletter

No. 17
August 14, 2003

Office: 1-662-325-2085

<http://msucares.com/newsletters/pests/cis/index.html>

Crop Situation: According to the Weekly Weather and Crop Report for the week ending August 10, the corn crop was 3% harvested, while sorghum and soybeans were 2% and 1% harvested respectively. Cotton was listed as 93% setting bolls and 2% with open bolls. This means that 7% of the crop did not begin setting bolls until after August 10! Obviously these fields will need an unusually late fall in order to make a 'full crop'. On the other hand, defoliant will soon be going out on some of the early maturing fields. Statewide average temperatures were 1 degree below normal for the week of August 4-10, and rainfall averaged 0.47 inches above normal.

Last Newsletter for 2003: This will be the last regular issue of the Crop Insect Situation Newsletter for the 2003 growing season. Past issues of the newsletter, for this year and for previous years, are posted on the Cotton Entomology Web Site, www.MSUcares.com/insects/cotton. This website also provides a variety of other information on cotton insects and their control.

Last Newsletter: This will also be the last issue of the Crop/Cotton Insect Situation Newsletter that I will be writing. At my request, I am being re-assigned to cover Horticultural and Household Insects. This will not involve any type of physical move, simply a re-focusing of effort. This request was made primarily for personal reasons. It was certainly not because I have not greatly enjoyed the past eleven years of working with cotton producers and cotton pest management professionals. We are in the process of interviewing several highly qualified candidates for the cotton entomology specialist position, and anticipate having one of these candidates on board before the end of the year. Thanks for all of your support and cooperation through the years! *Blake Layton*

Mississippi Entomological Association Annual Meeting: Mark your calendar! The annual meeting of the MEA will be held on **November 3, 4, & 5 of 2003** in the Bost Extension Building at Mississippi State University. The educational portion of the meeting will begin on the morning of the 4th. The annual golf tournament will be held on the afternoon of the 3rd. This is the 50th anniversary of MEA, and the program highlights include a review of the history of entomology in Mississippi, a special session on boll weevil eradication, and papers on the latest information on Mississippi insect problems. For more information about the MEA program and how to register contact the MSU Department of Entomology (662-325-2085).

Boll Weevil Eradication: So far this year only 14,183 boll weevils have been captured in the entire state of Mississippi. The majority of these weevils came from hotspots located in Regions 2 and 3. Considering that there are approximately 1.1 million acres of cotton planted in the state this year, that's not very many weevils, and this is 58% fewer weevils than had been captured by this time last season. These low numbers indicate that we are getting very close to the goal of eradicating this important pest. However, boll weevil activity and movement traditionally intensifies in late August and September, so

the period from now until the end of the season is a very critical one for Mississippi's BWEP. All scouts should be alert for live boll weevils and/or boll weevil egg-laying punctures. **Any detection of live weevils or egg-laying punctures (either in squares or small bolls) should be reported to Boll Weevil Eradication Personnel immediately.** Telephone numbers for the various BWEP work units are listed in the following table.

Boll Weevil Eradication Work Unit Offices

Region	Phone Number	Officer in Charge
4 (East MS)	(662) 651-4820	Arlon Cox
3 (South Hills)	(601) 605-2709	Danny Myers
3 (Central Hills)	(662) 289 5111	Charles Rogillio
3 (North Hills)	(662) 983-2666	Mark Ferguson
2 (South Delta)	(662) 873-9444	Mike Mullendore
1B (Cleveland)	(662) 843 1133	Doris Sprouse
1A (Inverness)	(662) 265-5444	W. G. Griffin
1A (Marks)	(662) 326-4003	James Burgess

How Late Can One Set a Pickable Boll? This year we have a significant amount of late planted cotton, especially in the northern portion of the state where planting was severely delayed by heavy rain. One of the key questions to ask about managing such crops from now till the end of season is 'How late can I realistically expect to set a pickable boll. The answer to this question can help one decide how long to protect a late maturing crop from insects. Of course the answer to this question also depends on the season. Occasionally, one is able to pick bolls resulting from blooms that opened on Labor Day, but this is not the norm. The answer to this question also depends on where in the state the crop is located and how late one is willing to wait before defoliating. Once these two factors are established, one can then examine the **probability** of being able to accumulate enough DD60s to mature a white bloom that occurs on a given date.

The following table summarizes information on the **probability** of accumulating enough heat units (750 DD60s) to mature bolls that appeared as white blooms by a specific date at Holly Springs, Stoneville, or Jackson. These data were condensed from more extensive information provided by Dr. Gordon Andrews based on 28+ years of historical weather data for each location.

Latest Date When a White Bloom has an 80% or 50% Probability of Accumulating 750 DD60s

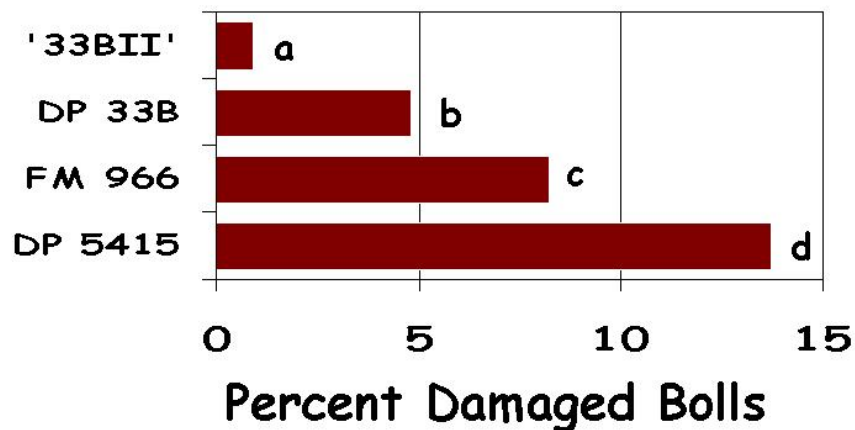
Location	80% Probability by October 1	50% Probability by First Frost
Holly Springs	August 2	August 11
Stoneville	August 12	August 26
Jackson	August 15	August 28

Adapted from graphs provided by Dr. Gordon Andrews

As for when to terminate treatments for budworm and bollworm on "late" crops, the last population of effective bolls still needs to be protected from damaging populations until they have accumulated 350 to 400 DD60s. That's 18 to 20 days at an average of 20 DD60s per day. This means that some of these late crops will still require protection until after Labor Day.

Performance of BollGard II: This year was the first year that BollGard II was available for commercial planting. Availability was very limited, but there are a number of 40 to 50 acre fields, and some larger plantings, scattered around the state. So far, performance of these BGII varieties has been as expected. Which is to say that it is much more effective than the single gene Bt varieties, but it is still possible to find a few large bollworms surviving in BGII fields, if one looks hard enough. The chart below summarizes the results of a small plot trial conducted in 2002 comparing BGII in the 33B background to the single gene variety DP 33B and two non-Bt varieties. Results of small plot trials conducted in three previous seasons were very similar. Collectively these results support the statement that in terms of caterpillar control, BG II is as much better than BollGard as BollGard is better than non-Bt varieties.

BollGard II Trial, Leflore Co. 2002 End of Season Damaged Boll Count



So far this year there have been a few cases in which the efficacy of BGII has been questioned, based on the ability to find a few live bollworms. And, there have even been a couple of fields of BGII that have been sprayed for bollworms, though, unless one leaves an untreated area and makes post-treatment counts, it is difficult to know whether such treatments are really necessary. However, past research results from other states indicate that unusual stress, such as prolonged flooding, can compromise the efficacy of BGII, resulting in significant levels of boll damage and/or the need to treat. Thus, BGII should not be considered to be totally 'worm proof' and, in future years, it will continue to be important to scout BGII fields for escaped bollworms and other caterpillar pests. However, given the greatly improved efficacy of BGII, it is clear that caterpillar treatments should not be applied to BGII fields based on the presence of eggs or newly hatched larvae, regardless of counts.

One of the most effective ways to get a good overall comparison of the performance of BGII relative to single gene and non-Bt varieties is to make end of season damaged boll counts. Ideally, such counts should be made after the crop has cutout and before bolls are 20% open. Make these damaged boll counts by randomly choosing a plant in the field and examining 100 consecutive bolls for any signs of caterpillar damage that breaches the boll wall (move down the first plant, up the next, and so on until 100 bolls are checked). Record the number, or percent, of bolls that are damaged, take a total of three or four such samples per field, and calculate the average number of damaged bolls per field. By taking such counts in a BGII field and in nearby Bt and non-Bt fields, one can better compare the overall caterpillar control provided by the BGII. However, in making such comparisons, it is also important to consider the number of insecticide treatments for caterpillar pests, and for other insects, that were applied to the various fields.

Caterpillar Pests in Soybeans: The shift to earlier maturing varieties of soybeans has done as much to reduce insect problems in soybeans as boll weevil eradication and Bt-cotton have done for cotton. Back in the days when “early beans” meant group Vs and “late beans” meant group VIIIs, soybean loopers and velvetbean caterpillars often took a big bite out of the soybean crop. Now that group Vs are the late beans, it is relatively uncommon for fields to require treatment for caterpillar pests. Still, it does happen, and scouts and producers still need to be alert for caterpillar pests on later maturing fields of soybeans.

During the time when soybeans are filling pods, the recommended treatment threshold is **4 or more worms ½ inch long or longer per foot of row** (loopers, VBC, green clover worms, or any combination), or when 20% defoliation has occurred and worms ½ inch long or longer are present. For sweep net samples this is **19 soybean loopers, or 38 VBC or green cloverworms per 25 sweeps**. This difference in thresholds for the sweep net is due to the fact that loopers hold on to the plant while VBC and GCW tend to flip off of the plant, and into the net, when disturbed. If you are trying to use a sweep net to sample a mixed population of caterpillar pests, just use a threshold of 38/25 sweeps, but count each looper twice.

When making treatment decisions in soybeans that are approaching senescence, keep in mind that much of the photosynthate stored in the leaves is moved into the pods as plants senesce. This means that letting the caterpillars have the leaves just because ‘they are near senescence anyway’ can cost yield. Leaves need to be protected from caterpillar pests as long as they are green. It is also important to keep in mind that caterpillars do 80 to 90% of their eating, during their last 3 or 4 days. This is why a field that looks fine from the turn row on Monday can be totally defoliated by Friday. Finally, one needs to keep in mind that there are several diseases that can reach epizootic levels in soybean caterpillar populations, rendering treatment un-necessary. So it is always a good idea to check for the presence of these diseases just before making a costly insecticide treatment.

In cases where it is necessary to apply treatments to control caterpillar pests, it is important to avoid any temptation to cut rates below those that are recommended. If you really need to treat, then you really need for that treatment to work. Cut rates do work sometimes, but sometimes they don’t, and the most expensive insecticide treatment that a grower can make is one that does not work. However, soybeans are a low input crop, and, depending on the population level and the insecticide, one can usually get acceptable control by using the lower end of the recommended rate range.

Loopers are generally more difficult to control than VBC or GCW, and it is important to be sure to choose an appropriate treatment when attempting to control loopers or mixed populations. Treatments recommended for control of loopers are listed in the table below. **Note that the treatments that are effective against loopers do not provide control of stink bugs.** In cases where stink bugs are also a concern one would need to tank mix an effective stink bug treatment, such as methyl parathion, with the looper treatment. In cases where velvetbean caterpillars and/or green cloverworms are the only caterpillar pests of concern, there are several alternative treatments, including some of the pyrethroids, that are either less costly and/or provide a broader spectrum of control against non-caterpillar pests.

Table 1: Insecticides recommended for control of soybean loopers in soybeans

Insecticide	Lbs ai/acre	Acres treated per gallon
Intrepid 2F *	0.06 - 0.12	32 to 16
Tracer 4SC	0.031 – 0.062	128 to 64
Larvin 3.2SC	0.45	7.1
Steward 1.25SC	0.055 – 0.11	22 to 11.3

* Intrepid is labeled under a Section 18 Emergency Exemption

Beneficial Insect of the Week:

***Copidisoma floridanum* (*C. truncatellum*):** This tiny parasitic wasp has no common name. It can be generally referred to as ‘the looper egg-larval parasite’, but in this article we will refer to it simply as *Copidisoma*. This is one of the more common parasites of loopers, both cabbage loopers and soybean loopers, and it certainly has one of the most interesting life histories of any of the beneficial insects featured in this section. (Science fiction writers get a lot of their wilder ideas from reading about parasitic insects such as this one). This parasite belongs to the family of parasitic wasps known as Encyrtidae. As implied above, it is listed in the literature both as *Copidisoma floridanum* and as *C. truncatellum*.

Biology: *Copidisoma* is referred to as an egg-larval parasite because its eggs are deposited in newly laid looper eggs, but it does not complete its development until the host is in the larval stage. Looper moths deposit eggs individually, usually on the undersides of leaves. Female *Copidisoma* wasps search for these eggs and deposit either one or two eggs inside each looper egg that they find. Some time after the looper larva emerges and begins feeding the *Copidisoma* egg begins to divide into additional eggs, 2, 4, 8, 16, 32, etc. Eventually a parasitized looper contains around 1000 of these *Copidisoma* eggs, all of which may have developed from a single original egg and all of which are genetically identical. Thus if only one *Copidisoma* egg was initially placed in the looper egg, all of the *Copidisoma* eggs will be either male or female. When two *Copidisoma* eggs are initially placed in the same looper egg, they are usually of opposite sexes.

Once the parasitized looper larvae reaches its fifth larval instar, changes in the growth hormones of the looper trigger the *Copidisoma* eggs to hatch and begin feeding within the body of the host caterpillar. Strangely, this also stimulates the host larva to delay its pupation and have additional larval instars, resulting in a larger larva that provides more food resources for the parasites developing within its body. The looper larva remains alive until after it forms its pupal cocoon on the underside of a leaf, but then dies, due to the feeding of the *Copidisoma* larvae, before it has a chance to pupate. By this time the body of the looper caterpillar is completely filled with the bodies of the *Copidisoma* parasites, which by this time have also pupated. The resulting looper mummies are initially tan to gray in color and have a grainy appearance due to the presence of the large number of *Copidisoma* pupae that can be seen through the skin of the looper. If one collects one of these mummified loopers and places it in an enclosed container, it will “hatch” within a few days into hundreds of very small, gnat-like adult *Copidisoma*. In one Louisiana study the average number of *Copidisoma* to develop from parasitized soybean loopers was 992, but as many as 2500 to 3000 parasites have been recorded from individual larva.

Hosts: As mentioned previously, *Copidisoma* attacks both cabbage loopers and soybean loopers, and it also attacks other loopers as well. In a 1968 Louisiana study, approximately 9% of all soybean loopers collected were parasitized by this wasp. However, levels of parasitism are often considerably higher than this, especially during the latter part of the season. Because parasitized loopers are killed before they emerge as moths and have a chance to reproduce, *Copidisoma* does help reduce overall looper populations. But, this is one parasite that can actually contribute to increased levels of crop injury. Because parasitized loopers often have additional larval instars and grow larger, they actually eat more than they would if they were not parasitized. In a 1985 Louisiana study, parasitized soybean loopers weighed 50% more and consumed 40% more leaf area than non-parasitized larvae.

Blake Layton
Extension Cotton Entomology Specialist

Area Entomology Specialists: Dr. Gordon Andrews
Dr. Mike Williams
Dr. Don Parker

Northeast Counties – Mike Williams: Since this is the last newsletter of this series for 2003, and since this is the last Dr. Blake Layton will edit, I thought I would take little space to express appreciation to him for his work on putting it together this year. He's done a good job and not always gotten great assistance from the rest of his crew, but I hope that our readers have been able to gain a little from what we have shared. We are presently interviewing a replacement for the row crop position and it will be up to that person to oversee the newsletter in 2004. So, THANKS Blake!

Cotton is beginning to show signs of cut-out in some places, but much of that in NE Mississippi is still going strong. Consultants are reporting a few spots where predominantly bollworms have been seen, and we are still treating some areas for stink bugs. The bugs seen are mostly the 'green stink bug', so pyrethroids will do a good job on them. Spider mites are still cropping up in some areas even though we have numerous rain showers in the area. Be careful and vigilant for fall armyworms. These critters can slip up on us and do hidden damage – that is until the picker goes over the field. Whole plant counts are essential at this time of year.

Soybeans should be checked closely for bugs and for worms. This is the time of the year when we need to walk soybean fields using a drop cloth looking for bugs and for worms. The soybean looper, the green cloverworm and the velvetbean caterpillar may all be foliar pests in soybean fields late in the year. The bollworm, commonly referred to as the "podworm" in soybeans, will feed on pods and cause direct losses to the bean crop.

Soybean plants can withstand as much as 35 percent foliage loss up to the blooming period. During blooming and when pods begin to form and fill out, any foliage loss of more than 20 percent will decrease yield. After the beans are mature and pods have fully expanded, a 35 percent loss of foliage will not usually reduce yield. It requires 4 or more foliage-feeding worms 1/2 inch long or longer per foot of row to cause 20 percent defoliation. It requires 8 or more foliage-feeding worms 1/2 inch long or longer per foot of row to cause 35 percent defoliation. Apply insecticides when worm populations are at or above the number required to cause defoliation equal to the defoliation levels listed above for each developmental stage of the plants. Apply insecticide if these defoliation levels have already occurred and larvae are still present. Once fruiting begins, the soybean plant does not add new leaves, although existing leaves may expand. Therefore, if plants are near the fruiting stage, do not allow more foliage to be removed if that loss will cause total defoliation to be 20 percent or more during pod-set and pod-filling.

Harvest of sweetpotatoes has begun and some good yields are being reported. We are also seeing some insect damage, but it is extremely light. Corn is also in the harvest mode, though SWCB moth captures are up this week and may go higher. A number of our cooperators have stopped trapping activities. If you still have bait and the inclination to run your traps, we would certainly like to continue to record your counts. Thanks!

Date:13 August 2003	Average per trap per week				
County	Bollworm	Budworm	BAW	Boll Weevil	SWCB
Adams					0.0
Alcorn					0.0
Attala					0.0
Benton					0.0
Bolivar	0.0	0.0	0.0	0.0	0.0
Calhoun					0.0
Carroll	13.0	3.0	53.0	0.0	0.0
Choctaw					0.0
Clay	36.0	3.0	2.0		0.0
Coahoma	3.5	4.0	9.5		0.0
Chickasaw	28.0	85.0	2.0		0.0
Grenada	27.0	0.0	42.0	0.0	206.5
Hinds					0.0
Holmes					0.0
Humphreys	9.5	24.0	60.0		0.0
Itawamba	12.0	1.0	0.0		0.0
Issaquena					0.0
Lee	2.0	14.0	0.0	0.0	0.0
Leflore	49.0	0.0	0.0		0.0
Lowndes	38.5	11.0	1.5	0.0	0.0
Madison	0.0	2.0	6.0	0.0	0.0
Monroe	50.0	19.0	2.0		0.0
Montgomery					0.0
Newton					0.0
Noxubee	6.0	6.0	0.0	0.0	0.0
Oktibbeha					0.0
Pontotoc					0.0
Prentiss	0.0	22.0	0.0	0.0	0.0
Quitman					0.0
Scott					0.0
Sharkey					0.0
Sunflower					0.0
Tallahatchie					241.1
Tippah					0.0
Tishomingo					0.0
Tunica	1.0	4.5	0.5	0.0	0.0
Union					0.0
Washington	0.0	0.0	0.0		0.0
Webster					0.0
Winston					0.0
Yazoo	15.5	1.5	2.5		0.0
BAW = Beet Armyworm and SWCB = Southwestern cornborer					

This newsletter is a free weekly publication issued by the Mississippi State University Extension Service for educational purposes only. The mention of product/trade names in this publication does not constitute a warranty or guarantee of the product nor does it imply endorsement to the exclusion of other products that may also be suitable. Pesticide users must read and follow the pesticide label.