



Vol 1 No. 6

June 4, 2008

Stink Bug Control in Ear-Stage Corn David Buntin, Grain Crop Entomologist

Stink bugs are back. After low levels the last two years, spring rains have increased bug populations especially brown stink bugs. Corn is most susceptible to stink bug injury during ear formation before tasseling. Bugs will feed through the sheath, causing a dead spot on the ear. As the ear expands it becomes distorted and curves usually outward. Feeding during silking and pollen shed also will kill kernels on the ear. Once the ear has elongated, stink bug feeding during the blister and milk stages blasts individual kernels usually causing them to abort.

Recent cage studies at Tifton have found no significant affect on corn grain production at infestation of 1 brown stink bug per plant. The old threshold (5% infested plants) that is in the Handbook is too low. I suggest using a 25% infested plants (1 bug per 4 plants) as a threshold during ear elongation to pollen shed and 50% infested plants (1 bug per 2 plants) during the later part of pollen shed and blister/milk stage. Bug is defined as adults and/or large nymphs. Initially stink bugs tend to be more prevalent on the field edge, so only a perimeter spray may be needed.

Methyl parathion (Declare 4EC, Methyl parathion 4E, Penncap-M FM) and Warrior 1SC and Capture 2E are effective in controlling stink bugs in corn. Parathion is the best choice for brown stink bugs. The label rate for the 4 lb/gal formulation is 1/2 pint per acre. For Penncap-M (2 lb/gal) use 1 pint/acre. However the parathion label does not allow for application during pollen shed. If early pollen shed is just beginning, apply parathion in the evening to avoid bees. At full pollen shed use, Capture / Brigade or Warrior / Karate Z or similar products can be used and will give suppression or brown stink bugs. Capture at 3.2 - 3.8 fl oz. per acre and Warrior at 3.2 - 3.84 fl oz. per acre, Karate Z at 1.60 to 1.92 fl. oz./acre are better choices than parathion for southern green stink bug. Parathion has less than 12 hours activity therefore re-infestation can occur after treatment. The pyrethroid treatments have residual activity for 1-2 weeks. Bidrin and Vydate which are used for stink bug control in cotton and are **not** labeled for use on corn.

Check the Georgia Pest Control Handbook for specific chemical recommendations, rates and precautions. BUT, Karate Z now has corn on the label.

Syngenta has re-formulated Warrior and expanded the Karate Z label

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Syngenta Crop Sciences has introduced Warrior II to replace Warrior. Warrior II is a 2.08 lb/gal formulation which is the same as Karate Z that we have been using for years. Warrior will be replaced by Warrior II in most of the country, BUT they will mainly market Karate Z instead of Warrior II in Georgia. The Karate Z label has been greatly expanded and is similar to the new Warrior II label. Notably Karate Z is now labeled for use on corn, sorghum and cereal crops. Also the new label for the first time included oats, barley, rye and grass pastures. This will be valuable addition to the short list of insecticides available for use on pastures.

DRYING AND STORAGE OF WHEAT

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Storage Facilities

Prepare the storage bin before harvest by emptying the bin and removing all traces of the previous crop. Good sanitation practices eliminate sources of food for rodents as well as host locations for disease and insect pests. A thorough cleanup involves cleaning pits, augers and transitions as well as any other locations in the grain handling system where grain can accumulate. For best results, follow the physical cleanup process with an approved insecticide to get ahead of insects before harvest begins. Thorough cleaning and pest control before bins are filled will help protect new crop grain from old crop pests.

Drying

Drying wheat during the summer months requires more attention than drying corn during the fall. Although the principles are the same, the rules of thumb are not. Wheat restricts airflow more than corn, so fans that can provide just enough air in a full bin of corn will fail to do so in wheat.

Wheat should be dried with natural air whenever possible to obtain the highest quality grain. Natural-air drying also reduces the tendency to overdry wheat. Wheat should be dried in shallow layers to maximize the airflow. Shallow layers should be less than 10 feet and moisture content less than 18 percent. Minimum airflow rates for drying wheat with natural air are listed in Table 1. Wheat should be dried to 13.5 percent for immediate sale since overdrying reduces the total weight of grain to be sold. However, if wheat is to be stored for any period of time during a warm summer, dry to 12 to 12.5 percent moisture content to prevent spoilage.

Table 1. Minimum recommended airflow rates for drying wheat with natural air.

Initial harvest moisture content (% wet basis)	Minimum recommended airflow rate (cfm/bu)
Up to 16	1.0
Up to 18	2.0
Up to 20	3.0

Soft red winter wheat dried with natural air at constant conditions will eventually reach the equilibrium moisture contents shown in Table 6.

Table 6. Equilibrium moisture content for soft red winter wheat.

Relative humidity (%)									
Temperature (°F)	10	20	30	40	50	60	70	80	90
70	5.7	7.5	8.9	10.1	11.3	12.4	13.6	15.0	16.9
80	5.6	7.4	8.7	9.9	11.0	12.1	13.3	14.7	16.5
90	5.5	7.2	8.5	9.7	10.8	11.9	13.0	14.4	16.2
100	5.4	7.1	8.4	9.5	10.6	11.7	12.8	14.1	15.9

When drying wet wheat with natural air, fans should be run day and night until the moisture content drops to about 15 percent. Wheat on the bottom of the bin is the first to dry, especially during hotter and drier daytime hours. As the air passes through the lower layers, it removes moisture from the wheat on the bottom layers and eventually becomes saturated so that it can't hold any more moisture. Hence, the wheat on the top layers does not dry until the wheat in the bottom layers is relatively dry.

During the night, the drier wheat on the bottom absorbs some moisture from the air and increases the depth of the drying front by removing moisture from grain above.

Run the fan selectively after the moisture content of the wheat reaches about 15 percent to remove the last percentage point or two of moisture. The best drying air occurs from about 10:00 a.m. to 8:00 p.m. on normal days when temperatures are high and humidity is low.

MONITORING AND AERATION

Monitor stored wheat on a regular basis, at least weekly until wheat is cooled to 50°F and then at least monthly until the grain is sold. Good monitoring practices require checking the moisture content and temperature of the wheat throughout the grain mass. Aeration fans should be run immediately if musty smells or crusted grain are detected. Continue running fans until the problem is solved or until the wheat is sold.

Corn Issues for June
Dr. Bob Kemerait and Jason Brock
June 2008

Spots on Leaves

A number of agents have called requesting diagnosis of spots found on corn leaves in many fields this season. The spots of greatest interest have been nearly circular in shape and have a bleached appearance (see pictures below from Turner County). The spots have been abundant in some fields.

Initially, we believed that the spots could be “Holcus leaf spot” caused by the bacterial pathogen *Pseudomonas syringae*. However Jason Brock, UGA diagnostician in Tifton was unable to isolate this pathogen or observe any signs of bacterial disease. Based upon the lack of evidence of pathogen and the nearly identical symptomology to paraquat herbicide injury, we concluded that the leaf spots were most likely not caused by any disease but were the result of herbicide drift.



Figures 1 and 2. Spots attributed to herbicide drift in Turner County. Note pepper-like dark specks in leaf spot in picture at left. These specks are structures of the fungus *Epicoccum nigrum*, a common saprophyte of dead tissue, but also reported to cause the disease “*Epicoccum leaf spot*” in Japan.

Several growers and agents were adamant that the spots on the corn leaves could not have been caused by paraquat drift and must be caused by something else.

Although we still believe that herbicide drift is the most likely cause of most of these spots, there is the possibility that a fungal disease of little importance may be the cause of the spots in some cases. Upon searching the Internet, we discovered that the weak pathogen *Epicoccum nigrum* has been reported to cause a leaf spot of corn in Japan similar to that pictured above. We commonly found two fungi associated with the spot- *Epicoccum nigrum* and *Alternaria* sp., both of which **frequently** colonize dead or damaged plant tissue in Georgia. It is possible that the spots found in some fields may have been caused by the *Epicoccum* fungus, though this is not proven.

Regardless of the cause of the spots, paraquat or *Epicoccum*, the growers **DO NOT NEED** to treat this problem with a fungicide! If it is *Epicoccum leaf spot*, it is of only minor interest.

Scalded leaves and tip burn

Agents from across Georgia have been puzzled and concerned by dramatic symptoms of scalded leaves in the corn fields in their counties. In the past two days, I have visited fields in Seminole and Miller Counties with such symptoms and received samples from Turner, Jenkins, and Baker Counties. I have received phone calls from Jefferson and other counties.

The symptoms appear as below:



Figure 3. Tip burn



Figure 4. Scald



Figure 5. Scald- Miller County, Tim Moore



Figure 6. Leaf scald- Jenkins County, Wade Parker

Growers have been concerned that these symptoms are the result of some disease problem. Dr. Dewey Lee, Jason Brock and I believe that these symptoms are all the result of drought, high temperatures, and desiccation of thin leaf tissue. The leaf scalds may result as irrigation water is put on the corn plants when temperatures are extremely hot. None of the symptoms pictured in Figures 3-6 are caused by disease.

Use of Fungicides for Control of Foliar Diseases of Corn in Georgia

Today there is great interest among corn growers in Georgia to treat their corn crop with a fungicide to protect against disease and also improve general plant health, e.g. strengthen the stalks to reduce the chance of premature lodging.

Below are my thoughts on the use of fungicides on field corn:

1. In Georgia, the following fungicides are labeled for use on corn: Tilt, Stratego, Quadris, Quilt, and Headline. The strobilurin fungicides (Headline and Quadris) and the strobilurin-propiconazole pre-mixes (Stratego and Quilt) are marketed to provide not

only disease control, but improve physiological health as well (better stalks, greener plants, delayed senescence, etc.) as well. In some marketing information, it is suggested that the physiological benefits of the strobilurin fungicides, even in the absence of significant disease, may be sufficient to more than pay for the cost of the fungicide through increased yields.

2. In numerous on-farm fungicide studies that I have conducted with agents, the only time that I have observed a significant increase in yield with the use of a fungicide has been when southern corn rust infects a susceptible, high-yielding variety. In every other study that we have conducted on-farm, **use of fungicides to control other diseases or to control southern rust on a more-resistant variety has not led to a significant yield increase.**
3. Therefore, my general recommendation to corn growers is to delay spraying a fungicide on their corn crop until either a) southern rust is founding the field, or b) southern rust is known to be active in your area.
4. Many growers are interested in applying fungicides like Headline, Quadris, Quilt, or Stratego to protect their crop and many are willing to apply the fungicide at first tassel as directed by some companies. Below are my thoughts on this application strategy:
 - a. In Georgia, we cannot be positive that an application of a strobilurin fungicide in the absence of disease will not bring yield benefit to the grower. However, we have not been able to document a yield benefit in the absence of disease.
 - b. Growers who make a fungicide application at first tassel (or even earlier) are certainly providing protection to their corn crop should it be needed. One of the best ways to manage a fungal disease is to have a protective fungicide in place BEFORE infection occurs.
 - c. The obvious concern about an early fungicide application (e.g. first tassel) is that it is made well before the pathogen infects the crop. This delay between application and infection could easily be long enough to reduce the efficacy of the remaining fungicide to the point that it no longer controls the disease and another application would be needed.

Growers should recognize that the fungicides currently labeled for use on corn in Georgia are quite effective and important tools. Growers should weigh the potential benefits of a fungicide application earlier than needed simply for disease control versus the possible costs when making a final decision.