



# PEST MANAGEMENT & CROP DEVELOPMENT

## BULLETIN

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### Japanese Beetle Reports Common Throughout Illinois

In mid-June I reported that Japanese beetles were beginning to show up in many fields across Illinois. Three weeks later, infestations of this pest are common, particularly in border rows of both corn and soybeans. Dale Baird, crop systems extension educator, indicated that he caught more than 100 Japanese beetles in a trap located in Lee County on June 27. On July 6, the same trap caught 1,244 beetles—an impressive increase! Similarly, Robert Bellm, crop systems extension educator, has reported heavy captures in southwestern Illinois: June 29—2,027; July 1—2,689; July 3—1,467; July 6—1,800. Chris Kallal, local field advisor for Monsanto, observed considerable feeding on corn leaves in a Mason County field near Manito on June 27.

Economic thresholds in soybeans are more clearly defined for insects, and rescue treatments should be considered when defoliation reaches 30% before bloom and 20% between bloom and pod fill. In corn, economic thresholds for defoliation are anything but clear. In general, corn can withstand considerable foliage injury before a treatment is required. For example, the established economic threshold for fall armyworm injury is when 75% of plants have whorl damage and worms are present. Other factors that can help in making treatment decisions for insect defoliators in corn include hail injury estimates and predicted yield loss assessments.

A good reference on this topic is the USDA Federal Crop Insurance Corporation's *Corn Loss Adjustment Standard Handbook—2007 and Succeeding Crop Years* (FCIC-25080, 11-2006), which can be viewed at [www.rma.usda.gov/handbooks/25000/2007/07\\_25080.pdf](http://www.rma.usda.gov/handbooks/25000/2007/07_25080.pdf). According to this reference (page 68), if 10% of the leaf area is destroyed on tassel stage corn, 3% of production will be lost. If 25% defoliation occurs, 9% will be lost. I encourage readers to review the USDA handbook before making any treatment decisions regarding defoliation injury in corn. Another point to keep in mind: Japanese beetle infestations are often clumped along field edges, so don't assume that an entire field has densities equal to those in field margins. Rescue treatments may be required only in border rows.

In my estimation, the primary threat that Japanese beetles represent in corn is silk clipping during pollination. Producers should consider a rescue treatment during tasseling and silking if there are 3 or more Japanese beetles per ear and pollination is not complete. Abundant soil moisture and rapid silk growth should be taken into consideration in making treatment decisions.—*Mike Gray*

### Soybean Aphids Found in Illinois—Infestations Off to a Slow Start This Season

While soybean aphids have been reported for some time by entomologists in several surrounding states, this insect pest is off to a very slow start in

Illinois. On July 1, Russ Higgins, IPM extension educator, found eight wingless soybean aphids on a V5 stage soybean plant just south of Morris in Grundy County. In addition to the aphids, Russ observed several adult sevenspotted lady beetles in the field. Ben Reep, Pioneer Hi-Bred International, found a winged soybean aphid on a V3-stage soybean plant near Elliott in Ford County after scouting six fields on July 1.

Also on July 1, two research teams from the Department of Crop Sciences conducted a survey for soybean aphids along two north-to-south transects in the northern half of the state. Under the direction of Ron Estes, research specialist at the University of Illinois, one team travelled along Route 47 and began sampling fields north of Gibson City, ending up just beyond Yorkville. The second team followed a path north from Eureka to just south of Rockford. Fields were randomly chosen and sampled every 20 miles; 20 whole-plant counts were taken in each field. No aphids were found in any of the 12 fields that were sampled.

Collectively these observations confirm that low densities of soybean aphids are present in widely scattered Illinois soybean fields. As we know, densities of this insect pest can increase rapidly in the absence of natural enemies, especially under mild temperatures. The soybean aphid story for 2009 has yet to be written, but it's not too early to begin scouting for aphids and natural enemies in soybean fields.—*Mike Gray and Ron Estes*

### Western Corn Rootworm Emergence Has Begun

On June 29, I received a first report of a western corn rootworm adult sighting near Carlinville. The corn was just beginning to tassel. Joe Spencer, an entomologist with the Illinois Natural History Survey, indicated on July 2 that his research team found corn rootworm larvae and pupae in their plots located near Champaign. I believe that by late this week, western corn

rootworm adults will begin to emerge across central Illinois. The emergence is somewhat later this year, though not by much. We will begin our annual root injury evaluations about a week later this season (July 20) than in previous years.

Producers are encouraged to look for signs of excessive root injury, such as lodged corn plants, in their fields and evaluate the level of control afforded by their transgenic corn or soil insecticide. I look forward to your observations. As adults become more numerous, don't forget to monitor plants for silk clipping to protect the pollination process. Consider a treatment if there are more than 5 beetles per plant and pollination is not complete.—*Mike Gray*

## PLANT DISEASES

### Considerations for Applying Foliar Fungicides to Corn

Applications of foliar fungicides to corn in Illinois and other midwestern states have been on the rise in the last two seasons, and this trend likely will continue in 2009. Summaries of results from university corn fungicide trials conducted in 2007 and 2008 in multiple states and Ontario, Canada, indicate that foliar fungicides did not provide an economic benefit every time they were applied. In fact, the range of yield responses was very wide, from approximately -20 bushels per acre to more than 20 bushels per acre relative to untreated checks, and the average yield responses were 3 and 3.6 bushels per acre in 2007 and 2008, respectively. A yield response in the vicinity of 3 bushels per acre will not be enough to cover the cost of the fungicide application unless the corn price is well over \$6 a bushel (**Table 1**).

So how should these university summaries be interpreted? The primary interpretation that can be made is that the yield response of corn to a foliar fungicide is highly variable when disease control is not specifically targeted. In other words, the foliar fungicide

applications made in these research trials were applied to corn based on the growth stage of corn only, and no considerations of disease pressure were made.

Dr. Greg Shaner, Purdue University, compiled results of 2008 university research trials based on disease pressure levels. He found that when disease severity was less than 5%, the average yield response was 1.2 bushels per acre; however, when disease severity was 5% or greater, the average yield response was 7.5 bushels per acre.

In Illinois, corn fungicide trials were conducted at eight locations. At five locations, the yield responses to foliar fungicides were low (3 bushels per acre or less). Disease pressure was also low (12% severity or less). At the other three locations, the yield responses were high enough for the fungicide applications to be profitable (11, 19, and 26 bushels per acre), and disease pressure was moderate to high (19%, 34%, and 42%). The bottom line of these research results is that the use of foliar fungicides was profitable only when diseases were present at a high enough level to cause economic yield losses.

### Foliar fungicides for disease control: A novel idea?

The information just described is very good evidence that foliar fungicide applications provide profitable yield benefits on a consistent basis *only* when disease pressure is severe enough to cause economic losses. The idea that fungicides can protect against yield losses when disease pressure is

**Table 1. Extra yield (bu/A) required to break even with a foliar fungicide application on corn.**

Corn price (\$/bu)	Application cost (\$/A)		
	\$24	\$28	\$32
\$3.00	8.0	9.3	10.7
\$3.50	6.9	8.0	9.1
\$4.00	6.0	7.0	8.0
\$4.50	5.3	6.2	7.1
\$5.00	4.8	5.6	6.4
\$5.50	4.4	5.1	5.8

severe is certainly not new. However, it has become evident that the issue of severity level is not stressed clearly enough in fungicide product advertisements. Claims of yield enhancement, improved growth efficiency, and stress tolerance are often the messages being touted, with little to no mention of diseases.

A supplemental label for Headline fungicide submitted by BASF was recently approved by the US EPA. This “Plant Health” supplemental label makes claims of improved growth efficiency (improved plant utilization of nitrogen) and stress tolerance (drought, heat, cold temperatures, and ozone damage). It is true that strobilurin fungicides can have other impacts on plants besides disease control. However, these “other effects” do not automatically translate into yield increases. Despite supplemental labels and advertisements, the primary reason to apply a foliar fungicide to corn should be to protect against disease.

Determining a corn field’s risk of developing a severe foliar disease problem can help with making a fungicide application decision. Certain production practices and factors can play a role in a field’s foliar disease risk. The likelihood of greater disease pressure increases when many of these factors are present:

#### *Previous crop and tillage practice.*

When corn was the previous crop and substantial residue is left on the soil surface, the risk of foliar diseases increases. Many of the fungal pathogens that cause foliar diseases on corn survive in corn debris.

*Planting date.* Research conducted in Illinois has indicated that late-planted corn is more at risk for some foliar diseases than early-planted corn.

*Hybrid susceptibility.* Most hybrids are rated for their susceptibility to diseases like gray leaf spot and northern leaf blight. When hybrids with greater susceptibility to these diseases are planted, the risk of the diseases increases. University trials conducted

**Table 2. Fungicide product comparison based on active ingredients.**

<i>Product</i>	<i>Rate/A<sup>a</sup></i>	<i>Strobilurin active ingredient (lb/A)</i>	<i>Propiconazole active ingredient (lb/A)</i>
Headline	6 fl oz	0.098 pyraclostrobin	Contains no propiconazole
Quadris	6 fl oz	0.098 azoxystrobin	Contains no propiconazole
Tilt / Bumper	4 fl oz	Contains no strobilurin	0.113
Quilt	14 fl oz	0.070 azoxystrobin	0.113
Quilt Xcel <sup>b</sup>	10.5 fl oz	0.097 azoxystrobin	0.084
Stratego	10 fl oz	0.081 trifloxystrobin	0.081

<sup>a</sup>Products may have a range of rates that can be used according to their labels. The most commonly used rates are listed. It is always important to read manufacturer labels for proper rates.

<sup>b</sup>Quilt Xcel was registered recently with the US EPA, but the Illinois registration label was still pending as of July 8, 2009.

in 2007 indicated that hybrids with a “fair to poor” rating for gray leaf spot resistance had a yield response of 6 bushels per acre to a foliar fungicide, compared to a 4 bushels per acre when a foliar fungicide was applied to hybrids with a “good to excellent” rating for gray leaf spot resistance.

*Weather and environment.* High relative humidity and moisture are important to the development of foliar disease on corn. Having leaves wet longer is favorable for infection by fungal pathogens.

*Disease observations.* Scouting fields prior to tassel emergence may give an indication of potential disease pressure. The earlier that some diseases are apparent, the greater the risk of losing yield. No hard-and-fast economic thresholds are available for foliar corn diseases, but scouting can help suggest how quickly diseases are building up on the lower leaves. Be aware of the following fungicide guidelines based on scouting observations:

- For susceptible or moderately susceptible hybrids, consider a fungicide application if the disease is present on the third leaf below the ear or higher on 50% of the plants before tasseling.
- For intermediate hybrids, consider a fungicide application if conditions and factors are favorable for disease and if disease is present on the third leaf below the ear or higher on 50% of the plants before tasseling.
- For resistant hybrids, a fungicide application generally is not recom-

mended, but field scouting is still important.

#### **Which product(s) should I use?**

In University of Illinois research trials, Headline, Quadris, Quilt, and Stratego have been tested in multiple years and locations. The results have indicated that when diseases are at a level high enough to reduce yield, all of these products generally are statistically equal in their effectiveness for disease control. **Table 2** compares products based on their active ingredients. When reviewing the table, it is important to be aware that an effective rate of one strobilurin active ingredient may not be the same as another strobilurin active ingredient.

The bottom line is that when disease pressure is high enough to reduce yields, most of the fungicide products available for corn will do a good job of protecting against diseases and yield losses.—*Carl A. Bradley*

## **CROP DEVELOPMENT**

### **Pollination 2009**

The NASS report this week indicates that 5% of the corn in Illinois was silking by Sunday, July 5. That’s not a fast start to pollination—the 5-year average by that date is 31%—but it’s a little bit ahead of 2008. By this date in 2008, 63% of the Illinois corn crop was rated as good or excellent, while this year that number is only 57%. Soil moisture conditions this year are better than they were in 2008, with only 3%

rated as deficient (short or very short) this year, compared to 15% in 2008.

As we know, rainfall was plentiful in July 2008, and the crop condition improved steadily, to more than 70% good or excellent by the end of July. We've had a good start to plentiful July rainfall in most of Illinois this year, so we can hope for a similar recovery. One difference between 2008 and 2009, however, is the obvious, and in some cases serious, compaction problems created during tillage and planting this year, as well as excessive rainfall before and after emergence. Visible tractor tire patterns remain in many fields, along with low areas that have yellow, stunted corn. Good weather is not likely to fully correct these problems.

In our planting date study here at Urbana, the earlier (110-day) hybrid planted on April 9 reached R1 (silking) on July 3. The same hybrid planted on April 26 reached silking on about July 7. We received rain on July 4 and again on July 7, so soil moisture is not limiting in these fields now. Nor is it likely to be for the next two weeks, during which much of the crop in Illinois will reach silking.

As we have seen in several other recent years, silks of many of the hybrids we grow today tend to emerge early and grow aggressively. While we have normally described the pollination process as one in which silks emerge a day or two after pollen shed begins, it is clear that this period can be as short as zero, and in some cases silks are beginning to emerge slightly before the first pollen is shed from the same plant.

This early silk emergence is likely a result of selection in newer hybrids for reduced "silking interval," the period between the time pollen shed begins and first silks emerge. Silking interval has been identified as a factor in stress tolerance of hybrids, particularly tolerance to inadequate water. Silk tissue is especially sensitive to lack of adequate water in the plant, and dry conditions

can mean that silks are delayed by several days. Pollen shed is less sensitive to lack of water, and it might even be speeded up when conditions are dry, especially when temperatures are high. In cases of serious drought, pollen shedding can end before the first silks appear.

So it stands to reason that selection for the ability to pollinate under stress means earlier appearance of silks. It is not clear if silks are simply less affected by low water availability—that is, if they can "draw" water better—or if there is something else at work. But when we have good pollination conditions, as we have had the past three years, silking can seem early and aggressive.

As far as we can tell, there is no drawback to this early and rapid growth of silks. Silks don't have much dry weight so don't "cost" the plant very much to produce. Rapid silk growth may provide enough material to dilute the effect of insect feeding, and rapid growth means that silks that are eaten off by an insect should recover more quickly. Pollen grains can land on, and germinate on, any part of the length of the silk, so as long as some intact silk is exposed when pollen grains land, the pollination process should proceed normally.

While we do gain considerable advantage in higher kernel number from normal to above-normal rainfall in July, it can bring some related problems that detract to some extent. June was relatively cloudy, and continued cloudiness associated with rainfall means less photosynthesis and less sugars in the plant to fuel the processes of pollination and kernel set. Wetness also can encourage leaf disease development, though we are seeing little of that so far. On balance, though, when we say that "rain makes grain" we usually refer to rain in July. This year, we hope rain continues into August, since the late planting of the crop will mean pollination later than normal in many fields.—*Emerson Nafziger*

## REGIONAL REPORTS

Extension center educators, unit educators, and unit assistants in northern, west-central, east-central, and southern Illinois prepare regional reports to provide more localized insight into pest situations and crop conditions in Illinois. The reports will keep you up to date on situations in field and forage crops as they develop throughout the season. The regions have been defined broadly to include the agricultural statistics districts as designated by the Illinois Agricultural Statistics Service, with slight modifications:

- North (Northwest and Northeast districts, plus Stark and Marshall counties)
- West-central (West and West Southwest districts, and Peoria, Woodford, Tazewell, Mason, Menard, and Logan counties from the Central district)
- East-central (East and East Southeast districts [except Marion, Clay, Richland, and Lawrence counties], McLean, DeWitt, and Macon counties from the Central district)
- South (Southwest and Southeast districts, and Marion, Clay, Richland, and Lawrence counties from the East Southeast district)

We hope these reports will provide additional benefits for staying current as the season progresses.

### Northern Illinois

Corn development varies throughout the region. Numerous fields exhibit uneven plant height, with the shorter plants in low field areas growing slower. Jim Morrison, crop systems extension educator, reports some lodged and green snap corn due to high winds last week. Some of the earlier-planted corn may begin to tassel late next week. Postemergence herbicide application in corn is nearly complete, with the focus now on soybean weed control.

Soybeans have been growing well over the last few weeks. There have been no reports of soybean aphids. Extension educators have begun to monitor soybean rust sentinel plots. Extension educators monitoring insect traps caught few Japanese beetles from July 1 through July 3, but early this week they have been catching 200 to over 1,500 beetles daily.

Only a few wheat fields have been harvested. There has been considerable second cutting of alfalfa and haylage.

### **Southern Illinois**

In celebration of July 4, the southern region received 2 to 4 inches of additional rain. This was probably fortunate for shallow-rooted corn fields that are beginning to pollinate, as well as for double-crop soybeans no-tilled into wheat stubble. Conventional soybeans (one almost hates to describe them as “full season” at this point) that were planted just before the rain fell may not be so happy, since they now have to deal with crusting soils.

For the most part, one would have to say that planting is complete, although there are scattered fields that are still fallow. It’s amazing to find corn that is pollinating in close proximity to replanted corn that is only at V2. The soybean rust sentinel plot near St.

Jacob that was no-tilled into wet soil on April 23 is now 36 inches tall and in full bloom, while most soybeans in the area are at V2 or less. The struggle to harvest wheat and finish planting means that some earlier-planted soybean fields have not had herbicides applied. The weed competition in these fields is fierce and needs to be addressed as soon as possible.

Japanese beetles seem especially abundant this year. Driving down the highway feels like passing through a hailstorm in some areas. The scattered fields of early-planted corn that are now silking should be closely monitored, since they will be especially attractive for silk clipping.

### **West-Central Illinois**

Recent rainfall means that some low spots are flooded again in the region.

Corn is either pollinating, on the verge of pollinating, or on the verge of tasselling in the west-central region, but variability in height and color still best describes area corn. The amount of moisture and accompanying warm weather (minus the cold spell surrounding the July 4 holiday) has elevated concern associated with gray leaf spot. The disease is now very easy to find in some area fields.

Some of the earliest beans are flowering, while other fields are only recently

emerged. Examined soybean rust sentinel plots are fairly clean of disease at the moment except for some evidence of phytophthora root rot, a disease to be expected given our wet conditions.

Wheat harvest is either completed (especially in southern portions of the region) or on target to start once the area dries out (especially in northern portions). Reports from the combine have not been as positive as in past years.

Most of the region is now acquainted with impressive pressure from Japanese beetles in row crops. A band running from Havana to Keokuk represents the most “virgin territory” for this pest, with exceptional pressure more restricted to fruit trees along the fringes of that band.

The second cutting of alfalfa has started for those who were fortunate enough to squeeze in a first cutting.

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