



PEST MANAGEMENT & CROP DEVELOPMENT

BULLETIN

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INSECTS

Japanese Beetles Are a Widespread Concern in Illinois

Upon my return from a 2-week vacation, I learned that Japanese beetles were introducing themselves to cornfields again this year. According to several reports, the numbers in some fields have been “scary.” Ron Hines, senior research specialist at the University of Illinois Dixon Springs Agricultural Center, has been capturing Japanese beetle adults in one of his traps in Pope County since the third week of June. He reports that this trap now is capturing more than 100 beetles per day. He has reported captures of Japanese beetles at three other trap locations (Massac, Pope, and Pulaski counties) since July 1.

Gone are the days when Japanese beetles in Illinois were a concern among growers almost exclusively in eastern counties in Illinois and states to our east. Within the past 5 to 10 years, Japanese beetles have become established throughout most of Illinois. The National Agricultural Pest Information System located at Purdue University has created a map of the “Reported Status of Japanese Beetle (JB), *Popillia japonica* in US and Puerto Rico (2002).” You can view the map at <http://www.ceris.purdue.edu/napis/pests/jb/imap/jb2002.html>. The map clearly shows that Japanese beetles have become established in almost all of Illinois, with some establishment indicated farther west (e.g., Iowa, Minnesota, Oklahoma).

In areas where this pest is a relative newcomer, people tend to overreact to its presence. After all, these insects are rather large, quite colorful, and somewhat noisy, and large clumps of them attract attention. However, as is frequently the case with newly recognized insect pests of field crops, their numbers usually look worse than they really are. People who have experienced significant silk clipping by Japanese beetles in the recent past probably will cringe when I say this, but I urge everyone not to overreact. Take a deep breath before and after you scout for Japanese beetles in corn, and make a decision that seems economically justifiable. There’s no reason to spray an entire field of corn when Japanese beetles are clipping silks only in small areas of a field.

Sampling for Japanese beetles to make a decision about whether an insecticide application is necessary is a challenge. Entomologists throughout the Midwest recommend sampling for most insect pests by scouting entire fields, stopping to take samples that represent the whole field. However, through the action of pheromones emitted by Japanese beetles, the distribution of these insects within fields usually is highly clumped. Many have

noted that clumps of Japanese beetles are particularly noticeable in field edges. This probably occurs as the very active beetles move from their areas of emergence from the soil to the most attractive flowering plants (and pheromone-emitting females) in the vicinity. Consequently, densities of Japanese beetles within a field will be overestimated if you sample only where clumps of these pests occur. Although the infestation of Japanese beetles may look overwhelming in one or a few areas within a field, it's entirely possible that the *average* density of the beetles for the field is below a level of economic concern.

Over the years, the standard economic threshold to prevent Japanese beetles from interfering with corn pollination has been three beetles per ear. When densities of Japanese beetles reach or exceed three per ear before pollination is complete and significant silk clipping is obvious, insecticide application may be warranted. However, this threshold is debatable, its origin lost in antiquity. So use your best judgment.

If an insecticide to control Japanese beetles is warranted, select a product from among those suggested in Table 1. Science and experience have taught us that pyrethroid insecticides, in general, lose some efficacy when temperatures are high. Also keep in mind that while Japanese beetles continue to emerge and move around, initial efficacy of almost any product will seem questionable because of beetles immigrating into sprayed fields. Keep this information in mind when you assess the efficacy of any product applied to control Japanese beetles in corn.—
Kevin Steffey

Table 1. Insecticides suggested for control of Japanese beetles in corn.

Product	Amount per acre
*Baythroid 2	1.6 to 2.8 oz
*Capture 2EC	2.1 to 6.4 oz
*Mustang Max	2.72 to 4 oz
*PennCap-M	2 to 3 pt
*Pounce 3.2EC	4 to 8 oz
Sevin XLR Plus	1 to 2 qt
*Warrior	2.56 to 3.84 oz

Numbers of Soybean Aphids Keep Increasing

The title of this article is almost becoming a theme—the numbers of soybean aphids have been increasing in fields in northern Illinois over the past few weeks, with no sign yet of slowing down. Reports from states north of Illinois (e.g., Michigan, Minnesota, Wisconsin) are similar. Although the great majority of fields in northern Illinois have relatively low densities of soybean aphids, certain “hot spots” have been noted by several people. For example, Steve Doench, an agronomist with Pioneer Hi-Bred International in Woodhull, has reported that, although the numbers of aphids are relatively low in most fields in his territory, he has found fairly heavy infestations in Bureau, Henry, Lee, and Whiteside counties. He also has noted that as densities within a field increase, the aphids are distributing themselves deeper into the plant canopy on stems and leaves. This “redistribution” from the top leaflets to stems and leaflets deeper in the canopy has been recognized by others in past years.

We have received one report that a field of soybeans has been sprayed with an insecticide to control soybean aphids. Apparently the folks who made that decision thought that the symptoms of injury and the numbers of aphids justified the application. However, I remind everyone that some of the symptoms of soybean aphid injury can be confused with other problems (e.g., nutrient deficiency). I re-emphasize that it's probably too early to spray insecticides for control of soybean aphids. The potential for soybean aphid populations to resurge in fields in which natural enemies have been killed is high. Multiple insecticide applications for control of soybean aphids make little economic sense.

We keep writing articles about soybean aphids in the *Bulletin* to keep people on their toes, not to fan the flames of concern. As soybeans devel-

op toward reproductive stages, it's very important that people make themselves aware of the fields in which threatening densities of soybean aphids are being observed. Insecticide applications to prevent yield losses are recommended only during late vegetative and early reproductive stages of soybean growth.

Keep monitoring soybean aphid populations, and let's hope that natural enemies (which have not been prevalent in most fields to date) and hot, humid weather will contribute to the demise of the aphids. Also remember that, as densities of soybean aphids increase within a field, winged aphids are produced, and these aphids leave the field to reinfest other, less crowded fields. Consequently, noting the presence of alate nymphs (nymphs with “shoulder pads,” indicating the eventual emergence of winged aphids) is crucial when making control decisions. If more than 50% of the aphids are alate nymphs, an insecticide application may not be necessary.—*Kevin Steffey*

Emerging Insect Issues

The first reports of emerging Japanese beetles came just a little over 2 weeks ago. In last week's *Bulletin* (issue no. 15, July 3, 2003), we reported that western corn rootworm adults also had begun to emerge. Not surprising, the frequency of emergence of both of these pests has increased over the past week, and both of them pose a threat to pollinating corn.

Japanese beetle biology was reviewed in issue no. 14 (June 27, 2003) of the *Bulletin*, and management of Japanese beetles in pollinating cornfields is discussed in another article in this issue of the *Bulletin*. So we'll concentrate on corn rootworms in this article.

Corn Rootworms

Corn rootworms begin emerging from the soil in late June and early July in Illinois, males first, followed by females. Female and male western corn rootworm beetles are similar in appearance. Females have a yellow body,

with three distinct black stripes on their wing covers, whereas males are slightly smaller, with predominantly black wing covers with a small portion of yellow visible at the tips. Northern corn rootworm beetles begin to emerge after the western corn rootworm beetles. They are cream or tan colored immediately after emerging and turn green as they mature. Northern corn rootworm beetles feed on the blossoms and pollen of many weed species.

When cornfields are not pollinating, Japanese beetles and western corn rootworm adults feed on foliage, stripping leaves of plant tissue. This type of injury does not generally cause economic damage. However, as corn begins to pollinate, both insects begin to congregate on silks. As they feed on and clip silks, they may interfere with pollination. This is especially important in seed corn production fields.

During the next couple of weeks, it will be very important to know what is going on in your fields. Just a reminder, a treatment may be needed for Japanese beetles during pollination when there are three or more beetles per ear, silks are being clipped to less than 1/2 inch, and pollination is not complete. Treatment for corn rootworm beetles in field corn may be required if there are five or more beetles per plant, silk clipping is observed, and pollination is not complete. In seed corn, treatment may be warranted if the silks on 20% of the plants have been clipped to a length of 3/4 inch or less, pollination is still taking place, and rootworm beetles are present.

Grasshoppers

Surprisingly enough, grasshoppers have been fairly abundant in the southern half of the state, despite the wet weather we've experienced the past couple of months. Entomologists at the University of Missouri also have noted significant populations of grasshoppers. We've received a few notes about people having applied insecticides for grasshopper control. Grasshoppers usually thrive in hot, dry

weather. Grasshopper nymphs feed in grass waterways, ditches, and other noncrop areas. When these plants are consumed, grasshoppers move into nearby fields of corn and soybeans, potentially causing serious defoliation as they go. Later in the season, they may feed on corn ears and soybean pods. Take some time to keep an eye on field edges as we progress into the summer months. These creatures can consume large amounts of plant tissue in relatively short periods of time.

Fall Armyworm

Although no one has reported finding fall armyworms yet, the prevalence of late-planted corn in southern counties certainly calls for monitoring for their presence. Fall armyworms do not overwinter in Illinois. Rather, they fly northward from the Gulf Coast states and points even farther south early in the summer. Consequently, they pose more of a threat to late-planted corn than to early-planted corn. Keep your eyes peeled, and let us know if you begin to find these hungry critters within the next few weeks.—*Kelly Cook and Kevin Steffey*

PLANT DISEASES

Odd-Looking Field Corn Diseases

Relatively speaking, this has been a dull year for disease scouting—so far, at least. Recent torrential rains can change that situation. Leaf blights will likely take advantage of the high moisture and humidity. Look for them when you are out getting pelted with Japanese beetles. Nevertheless, a few disease oddities are starting to pop up now as the corn begins to tassel.

Common Smut

Steve Ayers of the Champaign Extension unit brought in a sample to me of a fungal disease that was developing on leaves; it was common smut. His question to me was "Why is this on the leaves? The ears haven't emerged."

Well, a bit about smut. Common smut is actually a soilborne fungus: *Ustilago maydis*. Common smut is a very recognizable disease. It infects the growing point as well as other embryonic tissues of the corn plant. Infection actually occurs early in the season. In one sense, this a fairly lazy fungus, in that it typically needs some type of wound in seedling corn tissue to successfully infect the plant. The wounding usually takes place in the form of tissue damage to the seedling corn leaves from blowing spore-infested soil during heavy storms. The fungus is ubiquitous in our soils, and corn is susceptible, sweet corn even more, so the right environmental conditions are all that is needed for infection. I have observed through the years that corn that may have gotten a shot of a growth regulator herbicide, such as 2,4-D, a bit late in the season is likely to be affected by smut. Interestingly, different varieties respond differently to growth regulator damage and subsequent smut infection.

When an ear should be emerging on the corn plant, instead a proliferation of galls (smut balls) are produced that later form the familiar black, powdery spore masses as they mature. Yield loss is direct.

So why does common smut show up on leaves and occasionally tassels, too? Well, meristematic tissue is in those plant parts, too, so the fungus hops in for the ride and galls develop as those tissues mature.

Crazy Top

As tassels emerge, you will likely be seeing a fair amount of a very odd-looking disease called crazy top. Crazy top is caused by *Sclerophthora macrospora*, a soilborne fungus. It also is ubiquitous in our soils but only incites infection under conditions very favorable for the fungus. Under highly saturated or flooded conditions, the fungus produces motile spores. Typically, the soil must be saturated for 24 to 48 hours for the fungus to develop. Spores are either splashed up into the whorl or, in a flood situation, just

washed right into the whorl. The spores then infect the growing point of seedling corn, and the fungus grows systemically within the plant, just like common smut. When the plant should be tasseling, instead a great proliferation of short stunted leaves are produced in response to the fungal infection. It looks like a tight bouquet of leaves, which makes it easy to determine why this disease is named crazy top. Other than avoiding flooded conditions, there are no control measures for crazy top. It is usually very limited in its appearance and doesn't cause substantial yield loss as a whole.

Will we see more than the usual amount of common smut and crazy top this year? Only in those parts of the state that had highly saturated soils, numerous storms, and local flooding in the spring when seedling corn was present.—*Suzanne Bissonnette*

Gray Leaf Spot in Illinois Cornfields

The corn crop in the northern half of Illinois is generally doing very well, and the crop in southern Illinois is starting to catch up after late planting this spring. We have received a few unconfirmed reports of leaf diseases of corn—principally gray leaf spot (GLS) and anthracnose. The recent warm weather (above 76°F) and forecast for continuing warm temperatures suggest common rust will not be a problem this year. However, we should be on the lookout for southern rust, which, unlike common rust, is favored by warm temperatures. Southern rust pustules are most common on the upper leaf surfaces, whereas common rust pustules are common on both leaf surfaces.

The severity and incidence of gray leaf spot and other corn leaf diseases will be affected to a great extent by rainfall, humidity, and temperature in July. Because corn leaf diseases generally cause greatest yield losses when infection occurs early in the growth stages of the plant, it now is time to consider

scouting. Leaf diseases may be of particular concern in southern Illinois, where the corn is behind its normal development stage at this time of the year. Hence, there may be increased risk of losses from foliar diseases.

Gray leaf spot (caused by the fungus *Cercospora zea-maydis*) is usually the most common corn leaf disease across Illinois. This disease can take off quickly when the conditions are favorable. GLS infections are initiated from spores that are produced on infested corn residue remaining from the previous year. Large numbers of spores of the GLS pathogen usually are produced on residue beginning in June. After the spores are disseminated by wind and rain to the new crop, there may be a 1- to 2-week lag period before lesions become visible. GLS generally requires high humidity (>95%) for 24 hours, warm temperatures (75°F to 85°F), and susceptible inbreds or hybrids in order to cause significant damage. The symptoms of GLS first appear on lower leaves. Initial lesions are small, tan spots; 1 to 3 millimeters long; and irregular to rectangular in shape. As the lesions mature, they turn gray to tan in color and are rectangular in shape parallel to leaf veins.

GLS is managed by planting resistant hybrids, avoiding fields that were planted with corn the previous year, and making selective and timely applications of fungicides. Fungicides for management of GLS should be considered only for susceptible inbreds in most cases. In some fields where a susceptible hybrid is planted, the yield potential is high, disease pressure is high, and the environment is favorable for GLS. Under those conditions, then fields should be scouted and perhaps fungicide application should be considered. Fungicides should be applied in the time period of 1 to 2 weeks before tasseling to about 1 week after tasseling.

Several different fungicides are available for control of GLS, including propiconazole (Tilt and Propimax), azoxystrobin (Quadris), a mixture of

trifloxystrobin and propiconazole (Stratego), chlorothalonil (Bravo), and mancozeb (Dithane, Manzate, and Penncozeb). Always read and follow product label recommendations when using any fungicide. Additional information on control of corn leaf diseases can be found in the University of Illinois *Field Crop Scouting Manual* and the *2002 Illinois Agricultural Pest Management Handbook*.—*Dean Malvick*

WEEDS

University of Illinois Weed Science Web Site

Dissemination of weed management information can occur through a variety of formats, ranging from face-to-face meetings to contemporary electronic technologies. We are pleased to announce that the University of Illinois Weed Science Web site is now online. Our goal for this effort is to provide another format that clients can use to gather information on an assortment of weed management topics.

The weed science Web site is located at the following URL: <http://weeds.cropsci.uiuc.edu/>.

The home page contains links to some current topics and issues discussed by University of Illinois weed scientists. The buttons along the left side of the page take you to other areas of the site, such as weed identification, where you can find pictures and descriptions of more than 60 weed species. The "References" area provides links to newsletters and weed management recommendations from other states and pesticide manufacturers; turf, vegetable, and aquatic weed management guides; and so on. We list upcoming field days and meetings under "Events," descriptions of weed sciences courses under "Teaching," fact sheets and posters under "Extension," and on and on.

We hope this site will be useful in providing weed management information. Dawn Nordby, our newest Extension weed science specialist, is maintaining

the site and welcomes any comments and suggestions you would care to offer.—*Aaron Hager, Christy Sprague, and Dawn Nordby*

CROP DEVELOPMENT

Looking at Crops in Midseason

Two weeks ago, Bob Hoelt and I made some observations about nitrogen deficiency symptoms. Since that time, we have gotten several calls on this problem, and I have visited some fields, mostly northwest of Peoria, in or near Stark County. The affected areas of such fields are stunted and have the unmistakable K-deficiency symptom of yellowing of the edges of leaves, especially on the older leaves. This problem remains a conundrum: It appears in fields that seem otherwise in excellent condition; some fields where we see it have high enough K soil test values that this symptom should not appear; and there are either no indications of mechanical pattern, or in some cases the problem is actually less where there has been some soil compaction (such as in the end rows). Some hybrids might be less likely to show the symptom, and insect damage to roots accompanies this in some fields, but not all.

One of the more puzzling aspects in some fields is the occurrence of small “islands” of healthy plants, often only 5 to 10 plants, in the middle of stunted, yellow plants. Although this problem is generally more common on soils with medium or marginally low soil test K, George Rehm of the University of Minnesota has suggested that the dry soil conditions at and after planting might have resulted in slow movement of K through the soil solution and perhaps some increased tie-up of this nutrient in the soil. The seeming inability of the most affected plants to grow out of this condition, however, makes us think that the problem is often more than simple K deficiency. The one uniform aspect of the problem is small nodal root systems and restricted growth of belowground

nodes of the stem. If this were simply K deficiency, we think plants ought to have grown out of it, especially where there has been rainfall. It is possible that K deficiency is simply the most visible result, rather than the cause, of a restricted root system. Stay tuned as we try to figure out what might be happening in these fields, and let us know whether you have some insight on it.

In most early-planted fields, the corn crop looks good or even outstanding. Tassel appearance is a little slower than normal, reflecting the lower GDD accumulation and, in some areas, slightly slower growth from lack of adequate soil moisture. Crop height is average or above for the growth stage in most fields, however, which tells us that dry soil has not greatly decreased growth rates. Rainfall is needed for full potential to be reached as we enter pollination, and so we’ll be hoping for more than the hit-or-miss rainfall pattern that we have had over most of the southern half of Illinois since mid-June. We may receive some much-needed rain this week, but less than an inch of rain has fallen here at Urbana from mid-June through the first week of July.

Corn at this stage of growth has the potential to use about 0.25 to 0.3 inch of water per day under warm, sunny conditions with some wind. Although root systems are clearly tapped into soil water quite well, such a high rate of use without rainfall to replenish soil water supplies can result in very rapid onset of moisture shortage in plants. Appearance of tassels followed within a day or two by silks is the best indication that this is not happening, that water is not limiting to plant growth and function. The corn we planted here on March 24 is now fully silked, and there was little or no delay in silk appearance, so soil water was adequate even with little rainfall. Let’s hope that’s the case in most fields or that rainfall returns to normal.

Like corn tasseling, soybean flowering has been delayed somewhat from

normal, even though the warm temperatures recently have speeded up the process. Maturity Group 3 soybeans here, planted around May 24, are just now flowering and are at about the V6 stage, about 16 to 18 inches tall. Leaf color and health are quite good, so we believe that yield potential remains high. The crop is not yet at the stage when stress cuts into yield, however, so looking at the soybean crop now is similar to looking at the corn crop about a month earlier; excellent crop condition can still be wiped out by weather-related stress a month from now.—*Emerson D. 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

Scattered thunderstorms occurred throughout the region from July 5 through July 8. The precipitation was most welcome, but strong winds with the storms caused some crop damage as well as downed trees in Winnebago County on July 5 and Whiteside County on July 8. Also, isolated crop hail damage has been reported in Grundy and Whiteside counties. Total precipitation from July 5 through the morning of July 8 varies. However, both the U of I Research Farm in Dekalb County and a Morrison location (Whiteside County) reported more than 2 inches of total accumulation.

Corn growth was rapid last week because of the high temperatures and soil moisture. Potassium-deficient symptoms in corn have been reported throughout the region.

Jim Morrison, Extension educator, reports alfalfa fields being treated for potato leafhopper (PLH) infestations. PLH populations vary from field to field.

Southern Illinois

Hot and dry has replaced the previous cool and wet conditions. Crops are not yet exhibiting signs of moisture stress, but the limited root development of late-planted corn and soybean will potentially lead to problems later on unless timely rainfalls occur.

Early-planted corn is well into pollination, while late-planted corn is reaching knee high. We have received reports of Japanese beetles causing silk clipping in some fields. Corn pollinating now should be closely monitored for this pest. Ron Hines at Dixon Springs reports captures of second-generation European corn borer

moths. Unfortunately, there will be plenty of late-planted corn for them to lay eggs into.

Most field activities now revolve around postemergence herbicide applications on soybeans and late-planted corn.

Mark your calendars and plan to attend the Brownstown Agricultural Research Center Field Day on Thursday, July 24, 9:00 a.m. There will be seven tour stops covering pest management, soybean management, nitrogen management, and crop marketing. Come early, because the last tour will depart at 9:30 a.m. in order to beat the heat. A free lunch will be served following the tour.

West-Central Illinois

Strong storms rolled through the region on Tuesday afternoon and early Wednesday morning, while as much as 3.5 inches of rainfall was received in northern parts of the region. In Macomb, we received 2.5 inches as of Wednesday morning, with strong thunderstorms in the forecast. However, many areas to the south received only trace amounts of precipitation. Soil moisture is low in many areas and rainfall would be welcome.

Corn planted in mid-April is now tasseling, with some corn beginning to pollinate. Large numbers of rootworm beetles have been observed in some fields, so producers are being encouraged to monitor their crops for silk clipping. As of earlier this week, fourth-instar European corn borer larvae were found in a number of fields, with most infestation levels reported to be around 10% to 20%. A number of reports of stalk borer feeding along the edges of cornfields have also been received. Grape colaspis beetles can now be found in many

fields in high numbers, serving as an indication of the large numbers of larvae that must have been present earlier this spring.

Soybeans planted in late April and early May have begun to bloom within the past week. Other than some scattered reports of spider mite infestations along field borders, few pest problems have been reported in soybeans.

Wheat harvest is about 80% complete. Reported yields range from 60 to 100 bushels, with most of the crop doing somewhat better than anticipated.

Oat harvest is anticipated to go into full swing within the next few days.

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