Insects

Scattered Insect Observations from Around the State

Western corn rootworms. On May 29, Joe Spencer with the Illinois Natural History Survey observed second-instar corn rootworm larvae in his research plots northeast of Urbana. Joe, a well-known entomologist who specializes in insect behavior, has worked since the mid-1990s on characterizing western corn rootworm dispersal and their feeding behavior. His research has contributed significantly to our improved understanding of the rotation-“resistant” western corn rootworm, often referred to as the western corn rootworm variant.

Joe anticipates the first beetle emergence to occur in about 2 weeks (June 11–12). This is very early; typically I begin to get reports of adult emergence during 4th of July festivities. If the hot and dry weather persists in areas of Illinois more prone to corn rootworm damage (the northern two-thirds), heavy infestations of larvae could take their toll on small root systems. Because of the early hatch and accelerated development of larvae this spring due to very warm temperatures, even Bt hybrids may sustain more root injury than expected. The lack of soil moisture in many fields will speed up larval development due to the more rapid heating of dry soils. If you observe severe root injury caused by western corn rootworms during the next few weeks, please share your observations with me and I will report them in the Bulletin.

Japanese beetles. Adult Japanese beetles have been observed in southern, south-western, and south-central Illinois counties this last week of May. Ron Hines, formerly with University of Illinois Extension and now a crop consultant, saw Japanese beetles in Massac County on May 28. Robert Bellm, U of I Extension commercial agriculture educator, observed them in Fayette and Madison counties over the Memorial Day weekend. He estimates these sightings are about 2 weeks ahead of normal.

The suggested economic threshold for Japanese beetles in soybeans is based on a defoliation level of 30% before bloom. Special consideration should be given if fields are under severe moisture stress and soybeans are in the early stages of development. Japanese beetles tend to concentrate their numbers along field margins. It would be prudent during scouting to examine plants in several areas of the field interior; five separate areas are a common recommendation. Don’t base rescue treatment decisions on quick looks at defoliation in border rows. With the mild winter followed by a hot and dry spring, I anticipate overall good survival for Japanese beetles and encourage vigilant scouting throughout the growing season.
Potato leafhoppers. Potato leafhoppers can now be commonly seen in stands of alfalfa and should be monitored using a sweep net. This pest can inflict significant yield losses in alfalfa, especially in dry years. Field perimeters are often the first areas to show signs of injury. The regrowth of stands following a cutting should be examined carefully for leafhoppers. As few as 0.2 leafhoppers per sweep in alfalfa 0 to 3 inches high can significantly stunt further plant growth. Don’t assume that the dry weather is solely responsible for delayed plant development following a harvest.

For more information about the life cycle, biology, and management of the potato leafhopper, see this page on the Department of Crop Sciences website: extension.cropsci.illinois.edu/fieldcrops/alfalfa/potato_leafhopper.

Beet armyworms and yellowstriped armyworms. Both beet and yellowstriped armyworms have been observed in producers’ corn and soybean fields during the late days of May. Armyworm species are probably most often thought of as damaging corn and wheat, but the fall armyworm, beet armyworm, and yellowstriped armyworm are cited as occasional pests of soybeans in the Handbook of Soybean Insect Pests (Entomological Society of America). The economic threshold suggested for these species in soybeans is “when larvae threaten to reduce stands below the optimum plant population, typically to 6 or fewer plants per row-ft (19.7 per row-m).”

Kevin Black, insect and plant disease technical manager with Growmark, observed beet armyworms on corn in western and northwestern Illinois on May 29. The threshold for armyworms in seedling corn is when 25% of plants are damaged, larvae are ¾-inch or smaller, and some plants are being killed. The suggested economic threshold for armyworms in the Handbook of Corn Insects (Entomological Society of America) for seedling corn is “when stand loss exceeds 10%.” For the yellowstriped armyworm, the handbook says it “sel-
dom is a serious pest of corn in the Corn Belt. Control with insecticides is not economical unless feeding would cause heavy damage (defoliation greater than 50%).” Reasons for the greater occurrence of these armyworm species this spring are likely the mild winter, the warmer-than-average spring, and suitable migratory conditions this spring. Scouting for these species is encouraged in both corn and soybean fields for the next several weeks.—Mike Gray

Weeds

Precautions with Postemergence Corn Herbicides

While applications of postemergence corn herbicides continue in many areas of the state, they are all but complete in other areas. As the corn grows, it’s important to remember that the labels of most postemergence corn herbicides indicate a maximum corn growth stage beyond which broadcast applications should not be made. These stages are usually indicated as a particular plant height or leaf stage; sometimes both are listed.

For product labels that indicate a specific corn height and growth stage, be sure to follow the more restrictive of the two. For example, broadcast applications of glyphosate may be made through the 8-leaf collar stage or until corn reaches 30 inches in height, whichever comes first. Application restrictions exist for several reasons, but particularly important is the increased likelihood of crop injury if applications are made outside the specified growth stage or range. Be sure to consult the product label for specific information on maximum corn growth stages and whether the herbicide is labeled for directed application if the maximum corn growth stage has been exceeded.

Also, be cautious when applying growth regulator herbicides when corn is rapidly growing. Corn stalks can become “brittle” during periods of rapid growth and stem elongation, and these herbicides can enhance stalk brittleness.—Aaron Hager

Screening Waterhemp for Glyphosate Resistance

A few weeks ago we provided an update on herbicide-resistant waterhemp populations in Illinois (issue 6, May 10). In 2011, the overwhelming majority of sampled plants and fields demonstrated resistance to one or more herbicides. With continued support from the Illinois Soybean Association, we can offer free screening of waterhemp populations for herbicide resistance again this growing season.

To submit samples, follow these directions:

• After applying glyphosate, select five waterhemp survivors in the field.

• Remove the top inch or two from each plant (containing young, newly emerged, healthy leaves), and seal it in a sandwich-sized zip-top plastic bag. Use a separate bag for each plant.

• Place the bags in an envelope and send by overnight delivery to Dr. Chance Riggins, 320 ERML, 1201 W. Gregory Dr., Urbana, IL 61801. Ideally, samples should be sent the same day they are collected, but if necessary, they can be stored for a day or two in a refrigerator (but do not freeze). Do not send samples on a Friday or Saturday.

• Print the submission form included at the end of this issue and complete a copy for every field sampled.

Not every waterhemp plant that survives an application of glyphosate is resistant to it. If the following conditions all apply, however, you might suspect that a waterhemp population is indeed glyphosate resistant:

• The appropriate rate of glyphosate (plus proper adjuvants) was applied at the appropriate weed growth stage.
• Environmental conditions during and after application were conducive for good glyphosate activity.

• Plants that survived the glyphosate application are found next to plants that did not.

• The field has a history of glyphosate use.

We will not charge for the screening, but please understand that we cannot promise how soon results will be available. Also, because of the way we conduct the resistance tests, a result of “sensitive” does not rule out the possibility that the plant actually is resistant, but by a mechanism different from what we are testing for. Finally, be assured that we respect the privacy of those sending samples: we will not make the exact location of any sample or name associated with them available to anyone without your permission. If you have any questions, feel free to contact Pat Tranel (217-333-1531, tranel@illinois.edu)—Pat Tranel and Aaron Hager

Crop Development

Pre-Sidedress Nitrate Test: What to Know If You Use It

As I have mentioned in previous articles, nitrogen loss potential has been very low this year. Still, some people are interested in knowing how much nitrogen they should apply at sidedress. The pre-sidedress nitrogen test (PSNT), developed as a tool to determine the need for additional nitrogen, provides measures of the amount of nitrogen mineralized into plant-available forms from organic nitrogen pools plus the amount of carryover nitrogen or applied nitrogen still present in the soil. Performing the PSNT this year is not likely to tell you more than what you already know about how much N is still needed to provide a full rate. But if you consider the PSNT a necessity, take note of the following important points.

The usefulness of PSNT results can be heavily influenced by how samples are collected, handled, and processed. Even when everything is done correctly, there is still uncertainty on the utility of the information when test values are low. The PSNT is often more accurate in high-yielding environments and in fields that have received manure or other organic fertilizers in the recent past or have had legume crops with high nitrogen content, such as alfalfa. A value of 25 ppm or more is considered high and means that the probability is very small that more N needs to be applied.

Collect soil samples when corn is in the 4th- to 6th-leaf stage to a 1-foot depth at eight positions perpendicular to the direction of the nitrogen applicator. If the location of the knife application is known, start collecting there, and continue at 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, and 7/8 the distance between the rows. If the location of the knife application is not known, using this same approach starting with the corn row should provide adequate sampling. Place all eight cores in the same (large) sample bag. I suggest collecting at a density of one sample per 10 acres.

If the samples cannot be delivered to the testing lab on the day of collection, it is best to either freeze or quickly air-dry the soil. Freezing is easiest, but if drying is preferred, spread the sample on a paper, crush the cores, and use a fan to circulate air and speed the drying process. Indicate to the lab that you want nitrate nitrogen analysis so they know to dry and ground the entire soil sample before taking a subsample for analysis.

If the PSNT test values are 25 ppm or higher, there is no need for additional N; if values are 10 ppm or lower, a full rate of N is needed. For values between 10 and 25, adjust the nitrogen application proportionally.

A more practical approach than the PSNT to determining whether additional N is needed is to perform strip applications (60 to 80 lb N/acre) across the field to see if there is a response in growth or greenness. If the corn in the strips is greener or growing better, that would indicate a need to apply N to the rest of the field. Of course, the risk with this approach is that color differences may not develop until corn is in the grain-fill period, when it is too late to apply N. Another risk is that N applied late needs significant rain to move the fertilizer into the root zone, and large rain events are typically less common later in the season.

To reiterate, this year there should not be much uncertainty on how much N still needs to be applied. The potential for N loss due to weather conditions was minimal if applications were done correctly, so if you already applied the full rate, no more N should be needed. If you were planning to apply a portion at sidedress, applying it now rather than waiting is recommended.—Fabián G. Fernández

Early Season Crop Ratings and Yield

The National Agricultural Statistics Service’s weekly Crop Progress and Condition provides a subjective estimate of the condition of crops each week of the growing season, reported by percentage in the categories of very poor, poor, fair, good, and excellent. For convenience, many people combine the good and excellent categories to indicate how much of the crop is in good shape.

As a subjective measure, a crop rating tends to reflect mostly how the crop looks on a given day. But because the rating is one of the few actual numbers available starting early in the season, many like to use it to make guesses about yield potential. It’s no surprise that as the season progresses, the correlation between rating and final yield improves.

To see how well this works early in the season, I plotted the late May “good + excellent” (G–E) percentage for each of the past 12 years against final corn yield
for that year (Figure 1). The 28% rating in 2002 was one of the lowest on record, and that year turned out to be a very poor one, with a yield of only 136. That single year means that there is some correlation over years between the G–E rating in late May and yield (R² = 0.21). But when 2002 was removed, there was no relationship at all between the two factors (R² = 0.00). Going back to the worst corn year in the past 30 (1988), the late May G–E rating was 78%, and the crop yielded 73 bushels per acre. So it’s clear that the crop rating early in the season has almost no accuracy in predicting yield.

This month the G–E rating was 88% on May 6, which is very high. It dropped to 74% on May 13, rose to 79% on May 20, and dropped sharply to only 66% on May 27; the current rating is at about the average for the past 12 years. It’s also about the same as it was in 2011, even though this year’s crop is much advanced compared with a year ago.

How can a week with no major weather events trigger such a drop? In this case, the drop in ratings reflects the continuing dry weather. Because it’s a subjective measure, even a crop with a good stand and good uniformity is not likely to be rated as excellent when its leaves are rolling up in the afternoon due to lack of water. When you add to that the increased unevenness of plant size resulting from differences in root growth and water availability to individual plants and some loss of uniform green color as water and nutrients become more limiting, the crop starts to look less promising.

This leads to the question often asked at this stage of crop development: is stress reducing final yield potential, even if rainfall returns to normal levels? The short answer is no; we have no evidence that a corn plant that undergoes moderate water stress during the first half or so of its vegetative growth—say through V10 or so—suffers irreversible loss of potential kernel number or size.

Leaf rolling brought on by lack of adequate water is never a good thing, because rolled-up leaves do little or no photosynthesis. So plants under stress accumulate little dry matter, and after weeks of stress this reduction stunts growth and starts to diminish the potential for recovery. Leaves and stems that develop under such conditions tend to remain small, and this reduces their ability to photosynthesize fully even if water becomes available later.

If yields are lower than desired at the end of the season, though, many people will recall having seen stress symptoms during early vegetative growth and point to stress as an explanation. This often includes the observation that there were fewer kernel rows on the ear than expected or than that hybrid should have. It’s likely that stress can reduce kernel row number, though it is very difficult to show early stress as a cause. Seasons that produce low yields almost always have stress during the second half of the season, and separating the effects of earlier and later stress is not possible. Ears that show “zippering”—loss of kernel rows due to abortion—lose rows to stress after pollination, not during early vegetative growth.

In contrast, corn that undergoes moderate stress during early vegetative growth often yields very well in years when such stress is confined to the early season. In part this is because growth of the ear and tassel up through mid-vegetative stages requires very small amounts of the plant’s resources, so modest reductions in plant sugar have little effect. Also, these plant parts develop in the interior of the wrapped leaves and so are well protected from the effects of inadequate water.

The 2012 crop continues to develop at a rapid pace: growing degree-day accumulations in Illinois from May 1 to 27 exceeded normal by 115 GDD, or more than 30 percent. Average plant height on May 27 was 11 inches, which is likely a record for late May; in 2004 the average was only 7 inches, and that was on May 30. So the earliest-planted fields—those planted in mid-March—accumulated more than 1,000 GDD before the end of May. These fields need to accumulate...
only about 300 or so GDD to reach pollination. With normal temperatures this will happen by mid-June.

Along with being warmer than normal, May has been drier than normal in all parts of Illinois; rainfall across regions has ranged from less than an inch to some three inches. While the lack of normal amounts of rainfall continues to be a concern, fields where the roots are tapping well into the soil water generally have reasonably uniform growth and good crop color.

Other benefits to dry May weather are the near-total absence of drowned-out field areas and of the excessive losses of N that have followed wet spring weather in recent years. Soil conditions remain conducive to deeper rooting, and this could provide real benefits if dry conditions occur later in the season. Some plant diseases that require wet weather to develop are also minimized.

So on balance, the warm, dry weather has been favorable, and we do not believe that there has been any substantial loss of yield potential in most areas up to now. But of course the point will come where current soil water supplies can no longer provide water at rates high enough to sustain maximum growth rates, and the need for rainfall will become more urgent.—Emerson Nafziger

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Screening Waterhemp for Herbicide Resistance

2012 SAMPLE SUBMISSION FORM

Date: ______________________

Submitted by: _______________________________________________________

Company: _____________________________________________________________

Phone (specify office or cell): ___________________________________________

Email: (Please provide an email address for receiving test results)

Field Location (use a separate form for each field):

State: ____________________________ (required)

County: ___________________________ (required)

Township: _________________________ (preferred but not required)

GPS coordinates: ___________________ (preferred but not required)

Field Name or Grower: ________________________ (include if submitting samples from multiple fields)

Number of plants sampled: __________________ (5 samples per field are recommended)

Remove the top inch or two (containing young, newly emerged, healthy leaves) from each plant and seal it inside a sandwich-sized plastic zipper bag. Use a separate bag for each plant.

Additional information (please include herbicide use history, herbicides and rates applied this season, comments on observed weed control, and any other relevant comments):

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Send samples (including this form) by overnight delivery to: Dr. Chance Riggins, 320 ERML, 1201 W. Gregory Dr., Urbana, IL 61801.