Despite Saturated Soils, Corn Rootworm Injury Evident in East-Central Illinois

June continues to be a very wet month across Illinois and in many areas of the Corn Belt this year. With all the excess precipitation and standing water in many fields, some have asked how these conditions might affect corn rootworm pressure. Unlike during the previous two growing seasons, I believe this year’s rootworm population had a very good chance to establish on root systems and survive because of the early and quick pace of planting this spring. On June 10, Joe Spencer, an entomologist with the Illinois Natural History Survey, confirmed this prediction when he observed severe corn rootworm larval injury on plants in his plots located just north of Urbana. Several nodes of roots had been pruned on many of the plants he examined (photo on page 89). More injury is likely because many of the larvae were still second instars, and they will have a chance to continue chewing on additional root tissue as third instars.

Because of the saturated soils in many areas of the state this spring, I believe root systems may be shallower this year than we would like to see. Shallow root systems and severe root pruning could lead to significant lodging of plants in some fields. In some instances, even without corn rootworm feeding, shallow-rooted plants that become top-heavy later this year could be susceptible to lodging. If lodging occurs later this season, be sure to examine the root systems of these plants and determine the severity of root injury (if any). Don’t just assume corn rootworms are responsible.

Emergence is likely just around the corner, and I won’t be surprised if I begin to receive some reports of western corn rootworm adults by the end of next week. By the 4th of July, these sightings will become more common.—Mike Gray

Japanese Beetle “Season” Has Begun

On June 7, Ron Hines observed Japanese beetles on corn plants in Massac County. He also has noticed Japanese beetles feeding on several flowering shrubs in his yard (photo on page 89). Although sightings of Japanese beetles have been less common in central Illinois, they will become more numerous over the next week to 10 days. If the rains stop long enough for field visits to begin again, don’t be surprised to see densities of this insect pest increase. I believe survival through the winter should have been good for the grubs, and the early planting and root establishment will enhance the prospects for moderate to high populations of Japanese beetle adults this summer.

When scouting for adults in corn or soybean fields, be sure to move beyond the border rows. Research conducted in 2009 by Andy Morehouse, graduate student in the
Department of Crop Sciences, indicates there are considerable differences in adult densities between the interior of fields and border rows. If you’re finding Japanese beetle adults in your area of the state, I would be interested in hearing from you; I will share the observations with readers of the Bulletin.—Mike Gray

**Weeds**

**A Few Weed Control Reminders**

Plentiful and frequent precipitation has caused some delays in the application of postemergence herbicides. Weed size (both broadleaf and grass weeds) increases rapidly with warm air temperatures and adequate soil moisture, so be sure to scout before spraying to determine if the herbicide application rate should be adjusted for optimal control of larger weeds. The following are a few simple reminders with respect to postemergence herbicides.

- The maximum amount of glyphosate that can be applied in any single application varies between corn and soybean. Applications to corn cannot exceed a maximum of 1.1 lb ae glyphosate, while 1.5 lb ae is the maximum rate for soybean. Table 1 lists the product rates (fl oz/acre) of various glyphosate formulations (lb ae/gallon) that are equivalent to these maximum single application rates.

- Glyphosate can be applied to soybean from cracking through flowering (R2 growth stage). Glyphosate can be applied broadcast to corn through the V8 stage or up to 30 inches tall. Applications to corn between 30 and 48 inches tall must be made using drop nozzles. The risk of malformed ears later in the growing season is increased if these growth stage restrictions are not followed.

- Several herbicides can be tank-mixed with glyphosate to improve control of certain weed species (such as glyphosate-resistant biotypes and species more tolerant of glyphosate) or to provide residual weed control. If you are tank-mixing to improve control of weeds present at the time of application, be sure to consult the product label for application rates and additive recommendations. In soybean, contact herbicides are sometimes tank-mixed to try to improve control of species such as morningglory. Keep in mind that these tank-mix partners can increase soybean injury/leaf burn and can antagonize glyphosate’s activity on normally susceptible species.

- Glufosinate may be applied to glufosinate-resistant soybean varieties from emergence up to the bloom stage. Applications allowed by label include...
Table 1. Maximum per-application glyphosate rates based on formulation.

<table>
<thead>
<tr>
<th>Glyphosate formulation (lb ae/gal)</th>
<th>Product rate (fl oz) equivalent to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 lb ae/acre</td>
<td>1.5 lb ae/acre</td>
</tr>
<tr>
<td>1.1</td>
<td>48</td>
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<td>4.17</td>
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<td>4.5</td>
<td>32</td>
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sequential in-crop applications (each at 22 fluid ounces of Ignite) at least 10 to 14 days apart or a single application of 29 to 36 fluid ounces. Do not apply more than 22 fluid ounces to soybean beyond V3 to V4 growth stages.

—Aaron Hager

### Plant Diseases

#### Conditions Favorable for Phytophthora Root and Stem Rot

Phytophthora root and stem rot of soybean can occur when soil conditions are wet and the soil temperature is above 65°F. The disease is caused by a soil-borne pathogen known as *Phytophthora sojae*. Symptoms can be observed as wilting of plants, root systems with dark lesions that may be rotted, dark stem lesions extending up from the soil line, and seedlings that have damped-off. Wet soil conditions are required for Phytophthora rot to be severe, because the pathogen produces spores (zoospores) that must “swim” through the soil to infect soybean plants. The most severely affected areas in a field generally are those that tend to hold moisture for extended periods (low areas, areas with higher clay content, etc.). Infection can take place throughout the season, and adult plants can be killed in severe conditions.

With the high amounts of rainfall received throughout the state, it is likely that Phytophthora root and stem rot will be observed more frequently this year. No “in-season” management options are available for control. The best option is to plant a resistant variety. Two types of resistance are available: race-specific resistance and field tolerance. In addition, some fungicide seed treatments may provide some control.

**Race-specific resistance.** Soybean varieties with race-specific resistance use one or several Rps genes to provide control of specific races of the pathogen. This type of resistance provides complete control of the disease as long as the races of the pathogen present in the field are the same ones that can be controlled by the specific Rps gene(s) used in that variety. A race survey of *Phytophthora sojae* in Illinois was conducted in 2001 and 2002 by Dr. Dean Malvick (formerly with the University of Illinois). This survey indicated that many different races of the pathogen are present in Illinois, and some of these races can infect varieties that use some of the most common Rps genes for resistance (Table 2).

**Field tolerance.** Field tolerance is effective against all races of the pathogen, but this type of resistance does not provide complete control. Varieties with high levels of field tolerance can still be affected by Phytophthora, but they are not affected as severely as susceptible varieties. Different seed companies may use different terminology to describe “field tolerance.”

**Fungicide seed treatments.** Seed treatments that contain either mefenoxam or metalaxyl can provide some protection...
against Phytophthora, but not season-long control. Higher rates of mefenoxam and metalaxyl will provide better control than standard rates that are typically used in Illinois. Results of research at Ohio State University indicate that the use of seed treatments on varieties with high levels of field tolerance may be an effective combination in helping manage this disease.—Carl A. Bradley

**Crop Development**

**Corn Crop Canopy: Are We There Yet?**

Continued heavy rains in parts of Illinois have resulted in flooding and some loss of stands in low-lying areas. Many are concerned about loss of nitrogen, and some have taken remedial action, dropping nitrogen into the crop. In fields where rainfall has not been excessive, the continuing warm weather has provided the expected boost to growth rates. Growing degree-day accumulations since May are above average in most of Illinois now, keeping us well on track for an early start to pollination.

By now (June 11), corn planted at Urbana on April 5 is at V11 and about 45 inches tall; on April 21, V8 and about 28 inches; on May 10, V6 and 18 inches; and on May 28, V3 and about 7 inches. Once past stage V8 or so, corn needs only about 50 GDD to add a leaf stage. With warm temperatures, the crop can add two to three leaves and 12 inches or more in height in a week.

With warm temperatures and adequate water during early vegetative growth this year, leaves appear to be a little larger than normal, and this has caused the rows to “fill” earlier than we sometimes see. It’s considered a positive thing for the crop canopy to develop quickly, so that by the longest day (June 21) the crop is capable of intercepting much of the sunlight that falls each day.

The way we typically decide that the canopy has filled is to see little or no gap between rows as we drive past the field. The V11 corn shown in the first photo below would qualify as having filled the rows. As most people know who have walked a lot in corn fields, the look from the end of the field at 55 miles an hour can be deceiving. The second photo was taken facing down into the canopy shown in the first shot. It shows clearly that, while there is a lot of leaf area, it is not enough to intercept all of the sunlight. In this case, probably 20% or so of the sunlight falls on the ground, and it is lost in terms of photosynthesis. This figure will drop below 5% by pollination and should be only 2% to 3% in a fully formed canopy soon after pollination.

Even though sunlight interception by a rapidly growing crop in midvegetative stages is not complete, it’s hard to imagine that such a crop has no advantage over a later-planted, smaller crop. The third photo (page 92) shows a V6 crop photographed on the same day as the V11 crop in the first photo. The V6 crop is intercepting less than 25% of the sunlight reaching the ground.

![Corn at stage V11 and about 42 inches tall. The crop was planted on April 5 and photographed on June 10.](image)

![Photo facing down into the canopy shown in the previous photo. Note the sunlight reaching the ground.](image)
light, while the V11 crop is intercepting three to four times as much.

Even though the smaller crop will begin to grow rapidly and may reach V11 (the same stage as the larger crop now) within 15 to 18 days, it will lose out on a great deal of sunlight in the meantime. It’s likely that the smaller crop will intercept no more than half the sunlight that the larger crop will intercept during the first three weeks of June. But if previous patterns hold, the smaller plants (planted May 10) should yield 90% or so as much as the early-planted (April 5) crop. And with late planting and cool temperatures in May last year, most of the June sunlight hit the soil, not the crop. Yields were still good.

The lesson in this is that while early canopy development is a desirable thing, we can get very good yields without it, provided that the canopy eventually does develop fully and that we get enough sunlight during and after pollination, when it counts most toward yield. By the same token, various forms of injury during vegetative growth, such as mild nutrient deficiency, some water stress, and modest leaf damage from hail, often have little effect on yield potential unless the causes of the injury remain uncorrected.—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 South-west districts, and Peoria, Woodford, Tazewell, Mason, Menard, and Logan counties from the Central district)
- East-central (East and East Southeast districts [except Marion, Clay, Rich-

land, 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.

East-Central Illinois

Much of the region has had over 3 inches of rain in the last week. The tall corn is hiding some big ponds on the prairie. Almost no additional field work has been done. The corn crop is continuing to develop at breakneck pace. We expect to see some tassels emerging over the next week. The rain and rapid development have caused big problems for a few farmers who are still trying to get nitrogen applied.

Soybeans are looking excellent, with the exception of fields that are still waiting for herbicide applications. Velvetleaf is starting to take off in many fields.

Northern Illinois

There has not been a great deal of field activity during the past week due to near-daily precipitation in some areas. Most of the northern region received at least 1.5 inches of precipitation, while some areas received over 2.5 inches. Corn has been growing rapidly, and areas of uneven growth and lighter green color noticed earlier have improved. Overall, corn has a dark green color, but some fields are exhibiting weed pressure. Soybeans have been growing well, but some fields are likewise showing heavy weed pressure. Producers are waiting for drier weather for herbicide application.

Many alfalfa fields will be cut for the second time once weather conditions allow. Pastures look very good. Jim Morrison, crops systems extension educator, reported slug, true white grub, and annual white grub damage in a corn field no-tilled into grass/alfalfa.
Just a reminder that a small grains program will be held on Thursday, June 24, beginning at 5:30 p.m. at the U of I Northern Illinois Agronomy Research Center near Shabbona. The session will focus on small grain variety selection, disease management, and best management practices. The program is co-sponsored by the Illinois Wheat Association (IWA), and pork chop sandwiches will be served at the start. The cost is $5 per person; to assist with the meal count, please preregister by contacting IWA at 309-557-3662. Certified Crop Adviser CEUs have been applied for.

Southern Illinois

Storm fronts continue to leave the soil saturated in large areas of the region. Heavy rain, high winds, and large hail on Tuesday caused considerable damage in some areas of Madison County, and green snap can be observed in some fields. The earliest-planted corn is around three leaf collars away from tasseling. Japanese beetle adults have emerged, and populations will continue to build over the next few weeks.

The continued wet conditions mean there has been little additional progress toward completing soybean planting in the past week. Most soybean development ranges from VC to around V3, though a few fields planted very early are more advanced.

Wheat harvest will begin once rainfall stops and humidity levels drop enough to bring the grain moisture down to harvestable levels. Wet fields and standing water will once again make wheat harvest and double-crop soybean planting a challenge.

West-Central Illinois

The crop condition varies quite a bit from the western side of the region to the east. The farther west you go, the more rain has been received, and the crop conditions get worse. All of the moisture has caused the aquifer in Havana to come above ground. The report is that the water level is higher this year than it was in the 1993 flood. Many fields are under water. Several tornadoes swept through the region, causing lots of damage in certain locations.

Corn in Woodford, Tazewell, and Peoria Counties is on average about waist- (V8–V9) to shoulder-high (V10–V11), and the earliest planted fields are over your head (V13–V14). There are many yellow spots in the fields due to compaction or wet areas, but most fields look very good. On the western side of the region, corn ranges from V1 to V9 depending on how many times the field has been replanted—some 3 times!

The story is basically the same for soybean. The eastern side is mostly finished planting, and the average field is V2 to V4. Some drilled and 15-inch-row beans will canopy by the end of this week. On the western side, many fields either need to be replanted or have not been planted at all. With a 10-day forecast for more large rain events, the situation does not look good.

Wheat is turning very quickly. There are lots of diseases due to all of the moisture. Yields and quality will likely be poorer than expected several weeks ago. Alfalfa harvest has been slow, and most hay is getting rained on, if it has even been cut.

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