INSECTS

Corn Rootworm Larval Damage “The Worst I Have Ever Seen” Reported in Some Fields

Shortly after the article “Still Too Early to Assess Western Corn Rootworm Impact” (the Bulletin, issue no. 14, June 30, 2006) was posted to the Web, I received some reports of severe rootworm larval damage. Apparently my comment about our not receiving many reports of severe rootworm larval damage in 2006 sparked some responses. In fact, the phrase in the title of this article are attributed not to me but to a couple of people who reported damage. I have seen a lot of severe rootworm larval damage during my 30 years of observing the insect. However, when others indicate that damage is “the worst I have ever seen,” we take notice, especially hearing that from people who are observing damage caused by the variant western corn rootworm for the first time.

First, a report from an area where the western corn rootworm has been entrenched for quite some time—right here in east-central Illinois, near the area we lovingly refer to as the “epicenter.” Jim Goss with AG Farm Management in Urbana sent me some photos of severe rootworm larval damage in a field of corn planted after soybean just east of Piper City in Ford County. The damaged roots were from a non-Bt rootworm corn refuge that had not been treated with a soil insecticide. With damage so severe in the nontreated refuge, we will be interested in observing how much larval damage, if any, occurs on the Bt rootworm hybrid planted in the same field.

As some readers may remember, two fields very near Piper City were the first two in Illinois in which entomologists from the University of Illinois first observed significant western corn rootworm larval damage in corn planted after soybean. Although we had no idea what we were observing then (1987), we now know that we witnessed the early establishment of the variant western corn rootworm that lays eggs in soybean (as well as in other crops). Apparently the pest is still hard at work in this area of the state.

Now for some information from farther south. Based on a couple of reports received during the past week, the variant western corn rootworm is beginning to establish along the I-70 corridor. As I indicated in the aforementioned article in the Bulletin (issue no. 14, June 30, 2006), we received a couple of unconfirmed reports of severe rootworm larval damage in corn planted after soybean in southern counties. Well, we now have confirmation. Ryan Hasty, seed agronomist with Effingham-Clay Service Company, sent us photographs of severe damage in a field of corn planted after soybean just west of Effingham. The field had not been treated with a soil-applied insecticide at planting time. Ryan reported finding 20 to 30 rootworms per root system on some of the plants dug from the field. The damage is so severe that some of the corn plants have died.

I also received photos of severe rootworm damage from Kurt Maertens, technology development rep for Monsanto, taken in a field of corn planted after soybean near Donnellson on the Montgomery–Bond county line. The severe damage had first been noted by Rex Gray, M & M Service Company in Butler, two weeks before the photos were taken. The field, planted on April 24, had not been treated with a soil- or seed-applied insecticide. The most severe root damage (ranging from 2 to 2.5 on the 0-to-3 node injury scale) was observed on about 2 plants out of every 10 examined. The damage ranged from 1 to 1.5 on the 0-to-3 node injury scale on the other 8 plants.

The recent reports of severe corn rootworm larval damage are certainly in line with the large numbers of western corn rootworm adults being observed.
in cornfields at this time (refer to “Tassel High by the Fourth of July: Prepare for Silk Clipping by Western Corn Rootworms” by Mike Gray in this issue of the Bulletin). As the days and weeks roll by, we’ll get a better idea of the statewide impact of western corn rootworms (variant and otherwise) in 2006. For now, it seems that the variant western corn rootworm is beginning to establish in some new areas, and it continues to remind us of its potential for crop damage in areas where it has been established for some time. As always, we will report preliminary information from our own assessments of rootworm larval damage as soon as they are available. In the meantime, please continue to keep us informed about rootworms in your area of the state.—Kevin Steffey

Tassel High by the Fourth of July: Prepare for Silk Clipping by Western Corn Rootworms

Western corn rootworm adults have taken flight across the Illinois agricultural landscape. Throughout much of central Illinois, many cornfields have begun to tassel, and we’ve received some reports of fields already being treated to prevent excessive silk clipping. Producers should consider a rescue treatment to protect pollination if there are five or more beetles per plant, pollination is not complete, and silk clipping is observed. There are many insecticides listed in the 2006 Illinois Agricultural Pest Management Handbook that may be used against corn rootworm adults to prevent silk clipping. Many of the products listed for control of western corn rootworm adults during the pollination period are pyrethroids (see Table 1). Efficacy of these products may be compromised somewhat under very hot conditions.

Why are western corn rootworm adult densities seemingly so high every year? Many reasons help explain why corn rootworm adult densities continue to be so impressive year after year. The primary factors are these: (1) very mild winters (which may contribute to better egg survival), (2) excellent soil conditions (soil not saturated) at the time of larval hatch, (3) the long-term trend toward earlier and earlier planting of corn, (4) few significant natural enemies, and (5) greater overall agricultural landmass (first-year corn and continuous corn), which serves as a corn rootworm “nursery.” Before the mid-1990s, western corn rootworm adults survived only in continuous corn production systems. This has changed significantly in the last decade with the growing importance of the variant western corn rootworm.

Why do we see so many western corn rootworm adults at pollination even when we’ve used a soil insecticide or a transgenic corn rootworm hybrid? Research conducted at the University of Illinois in the late 1980s clearly documented that adult emergence is plentiful even when a soil insecticide has been used. Because soil insecticides applied at planting are placed in narrow (7 inch) bands or in-furrow, the soil outside of these treated areas (between rows) serves as a refuge for corn rootworm larvae. In this sense, producers have unwittingly utilized a sound refuge strategy for soil insecticides for decades. The traditional granular soil insecticide products are typically very water insoluble. Consequently, very little movement of these products occurs outside of the treated areas. Corn rootworm larvae thrive in the soil between corn rows as corn roots proliferate throughout these untreated zones. In general, the soil insecticides accomplish their mission; that is, they protect the plant from lodging by preventing excessive pruning of brace roots. Soil insecticides were never designed to be population management tools.

Even though you’ve planted a transgenic corn rootworm hybrid (YieldGard Rootworm, MON 863, Cry3Bb1, Herculex RW, DAS-59122-7, Cry-34Ab1/Cry35Ab1), corn rootworm adults will be found in those fields during pollination as well. Unlike the Bt hybrids used to control European corn borers that are characterized as high-dose events, Bt hybrids designed to limit corn rootworm larval injury allow for greater survivorship to the adult stage of development. Bt seed also is treated with a low rate of a neonicotinoid insecticide (Poncho—clothianidin, Cruiser—thiamethoxam). So western corn rootworm adults that emerge from a field planted with a transgenic corn root hybrid have been exposed simultaneously to a Bt protein and a neonicotinoid insecticide. Despite this dual assault, many still survive to the adult stage and threaten the pollination process. Bottom line—don’t assume that just because you planted a Bt hybrid for corn rootworms you’re safe over the next several weeks through pollination. This could be a mistake. Take some time to scout your fields and consider the treatment recommendations suggested previously.—Mike Gray

Table 1. Insecticides registered for use against corn rootworm adults to prevent silk clipping.

<table>
<thead>
<tr>
<th>Insecticide product</th>
<th>Amount of product per acre</th>
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<tbody>
<tr>
<td>Ambush 25W</td>
<td>6.4 to 12.8 oz.</td>
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<tr>
<td>Asana XL</td>
<td>5.8 to 9.6 oz.</td>
</tr>
<tr>
<td>Baythroid 2</td>
<td>1.6 to 2.8 oz.</td>
</tr>
<tr>
<td>Capture 2EC</td>
<td>2.1 to 6.4 oz.</td>
</tr>
<tr>
<td>Dimethoate 4EC</td>
<td>2/3 to 1 pt.</td>
</tr>
<tr>
<td>Lorsban 4E</td>
<td>1 to 2 pt.</td>
</tr>
<tr>
<td>Mustang Max</td>
<td>2.72 to 4 oz.</td>
</tr>
<tr>
<td>PennCap-M</td>
<td>1 to 2 pt.</td>
</tr>
<tr>
<td>Pounce 3.2 EC</td>
<td>4 to 8 oz.</td>
</tr>
<tr>
<td>Proaxis</td>
<td>2.56 to 3.84 oz.</td>
</tr>
<tr>
<td>Sevin XLR Plus</td>
<td>1 to 2 qt.</td>
</tr>
<tr>
<td>*Warrior</td>
<td>2.56 to 3.84 oz.</td>
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</table>

*Use restricted to certified applicators.

Japanese Beetles Will Not Go Away Any Time Soon

With reports of ridiculous numbers of Japanese beetles continuing to come into our offices, I’m not certain we can provide much more information than we already have. The insects are far more than a nuisance in many Illinois corn and soybean fields, and homeowners are battling them on flowers, fruits, and ornamentals. For an update on numbers of Japanese beetles in southern Illinois, refer to “The Hines Report” at http://www.ipm.uiuc.edu/pubs/hines_report/index.html.
We have been asked about “combination silk clipping injury” by both the Japanese beetle and western corn rootworm. Each species has its own threshold (three or more Japanese beetles per ear, five or more western corn rootworm adults per plant), but there is no threshold for both insects clipping silks in the same field. Under such circumstances, people making decisions about whether insecticide application is necessary will have to use their best judgment, hopefully based on some experience. About the best we can do is to suggest that the focus should be on the extent and longevity (how many days) of silk clipping by both insects, rather than on the numbers of either or both insects. Also, remember that silk clipping should be observed before a decision is made to apply an insecticide. Once again, we have received some reports that Japanese beetles, in particular, seem to feed preferentially on the silks of some hybrids and not others. The presence of the insects without observed silk clipping may suggest that an insecticide application is not warranted. Nonetheless, continued monitoring through the pollination period is strongly encouraged.

Insecticides for control of Japanese beetles in corn were published in “Get Ready for . . . Japanese Beetles,” issue no. 13, June 23, 2006, of the Bulletin. Insecticides suggested for control of western corn rootworm beetles in corn are included in “Tassel High by the Fourth of July: Prepare for Silk Clipping by Western Corn Rootworms” in this issue. Please note that not all insecticides are registered for control of both insects. If both insects must be controlled to protect pollination, select an insecticide labeled for control of both insects. And remember, the efficacy of pyrethroid insecticides declines as temperatures increase above 90°F.—Kevin Steffey and Mike Gray

Instances of Inconsistent Weed Control with Glyphosate

During the past week, there has been a noticeable increase in callers reporting “missing” weeds with an initial post-emergence application of glyphosate in soybean. The species most commonly mentioned include waterhemp, horseweed (marestail), giant ragweed, common ragweed, and common lambsquarters. We have observed a similar “decreased performance” from glyphosate-containing products for each of these species during past seasons (lambsquarters in 2001 and 2005, horseweed in 2003, giant ragweed in 2004, etc.), but it seems that inconsistent weed control with glyphosate may be as widespread in 2006 as in any previous season.

What factors might be contributing to these weed escapes? If the reason were clear-cut in each situation, finding a solution would be (relatively) easier. Unfortunately, it seems that myriad factors might be contributing incremental portions to this problem. For example, weed control practitioners have known for years that common lambsquarters can be more difficult to control with glyphosate than other broadleaf weed species, particularly under dry/drought conditions. Waterhemp is a species with multiple emergence events, so there typically exists a wide range of plant sizes in fields when the postemergence application is made. Obviously, larger weeds can be expected to be more difficult to control because they are older plants and also because spray coverage can be limited. Application rate, volume, and spray additives are important factors to keep in mind, especially if you are attempting to achieve good spray coverage on larger weeds.

Similar to previous seasons, insect feeding within the stem tissue of various weed species has been very noticeable in some areas of Illinois and may have contributed to poor control following the application of a postemergence herbicide. Weed species that harbor these insects included waterhemp, giant ragweed, horseweed/marestail, annual smartweed species, common ragweed, and common lambsquarters. Researchers have identified insects in the Lepidoptera (Papaipema nebris, Ostrinia nubilalis, Epiblema spp.) and Coleoptera (Rhodibaenus tredecimpunctatus, Lixus spp., Dectus spp., Hippopsis lemniscata) orders present in these weed species as either larva or adults. Insect tunneling is most frequently observed in stems of large weeds (plants 6 or more inches high) compared with stems of smaller weeds.

Past, present, and near-future weather conditions can influence herbicide performance by affecting how much herbicide enters the plant and, to some extent, how extensively the herbicide translocates within the plant following absorption. Dry soils coupled with hot, low-humidity days tend to reduce the amount of herbicide absorbed by plants. In contrast, weeds growing with adequate soil moisture typically absorb applied herbicides faster and often more thoroughly.

What about the possibility that some of these weed escapes may suggest the occurrence of a weed population with resistance to glyphosate? Since the commercialization of glyphosate-resistant crops, the question of whether glyphosate-resistant weeds will or will not be selected has been extensively bantered around by individuals involved in virtually all phases of production agriculture. Those in academia have generally agreed on at least two points: (1) the potential for selecting weed biotypes resistant to glyphosate is less than that associated with selecting biotypes resistant to other herbicide families, and (2) never say it will never happen. Whichever position you might have taken on this question during the early years of glyphosate use in-crop, some facts to consider include these: glyphosate-resistant weed populations have been selected in the United States and in several other countries of the world; these resistant populations represent more than one weed species; several states, from the Midwest to the East Coast, have reported instances of glyphosate-resistant weeds; and we have no evidence to suggest that Illinois will be immune to this phenomenon.

Researchers at the University of Missouri have recently reported two
populations of waterhemp that have consistently survived after glyphosate applications under field and greenhouse conditions. News releases from Missouri reported some of these waterhemp plants survived up to 6 lb acid equivalent glyphosate (a rate approximately equivalent to 170 fluid ounces of Roundup Original Max). If glyphosate-resistant weeds such as waterhemp can occur in other states, it seems likely that resistant weeds can be selected in Illinois. —Aaron Hager and Dawn Nordby

REGIONAL REPORTS

Northern Illinois

Moderate temperatures have returned to the region, which will be beneficial as some of the earliest-planted corn will begin to tassel by the end of the week. Most of the region received precipitation on July 3, ranging from 0.3 inch or less in the northwest and 0.5 to 1 inch in the northeast.

Soybean aphids are present in the region, but there have been no reports of populations reaching economic thresholds. We continue to receive numerous reports of cupped soybean leaves.

Extension educators began monitoring for western bean cutworm moths on July 1 as part of a multistate effort.

Trapping will continue for about six weeks.

West-Central Illinois

Rain continues to be exceptionally spotty in the west-central region of the state. One field receives somewhat adequate rainfall, while several nearby fields receive little precipitation of consequence. Most producers now feel that the “drought is over” declarations made a few to several weeks ago were premature.

Wheat harvest is wrapping up in the region. While yield estimates may not have been record breakers, they did appear more than acceptable. Many commented on the exceptional appearance of that crop at harvest.

Potato leafhopper continues to be the major story in alfalfa and appears to have surprised a number of individuals. More than a few yellow, hopper-burned field edges testify to that fact.

Soybean fields continue to display impressive infestations of Rhizoctonia root rot and now display some exceptional leaf injury from foliage-feeding pests, including the Japanese beetle.

The Japanese beetle and the adult western corn rootworm beetle are now topics of conversation regarding corn. Silk clipping already appears fairly impressive in many areas throughout the region. Varied silk emergence, intense beetle pressure, and tight margins again raise the question “to spray or not to spray.” Diseasewise, the corn crop as of this moment still appears exceptionally healthy, with few fields displaying intense lesion development above the ear leaf and many fields displaying little to no lesion development at all.

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