



# PEST MANAGEMENT & CROP DEVELOPMENT

## BULLETIN

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## INSECTS

### Vigilance for European Corn Borer Escalates

During the week of June 17, the number of reports of infestations of first-generation European corn borers increased considerably. The heaviest infestations (most of them subeconomic) seem to be in western counties right now, with lighter infestations reported elsewhere. Following are a few reports from around the state, most of them from central Illinois:

- In Clark County, Kevin Wirth (Effingham Equity in Marshall) and Shannon Schultz (Monsanto) found third instars in the midribs in no more than 20% of the plants in fields they scouted on June 21.
- In Piatt County, Ben Reep found European corn borer larvae in every field of non-Bt corn, in which plants were taller than 18 inches, on June 17 and 18. The maximum infestation he observed was 7%, with only one to two larvae per plant. At that time the larvae were first and second instars.
- In Scott County, while visiting with the folks with Burrus Power Hybrids, we found second instars in less than 25% of the plants in one field.
- In Peoria County, Wayne Streitmatter observed infestations, ranging from less than 10% to 34%, on June 20. The field with 34% infestation had an average of 1.2 first instars per plant.

We sent a couple of our graduate students (Jered Schroeder and Nathan Wentworth) out to look for corn borers on June 24 and 25, and, in general, they found few worrisome levels of infestation. In three fields in Knox County, they found 4%, 8%, and 28% of the plants infested, with an average of 0.5 to 1 borer per whorl. In two fields in Henry County and Bureau County, they assessed 36% and 4% of the plants infested, with 1.5 and 0.5 borer per whorl, respectively.

Based on the observation by Kevin Wirth and Shannon Schultz, European corn borer larvae in the southern half of the state probably are beyond control with insecticides by now. Many of the larvae have tunneled into midribs and stalks where insecticides usually will not kill them. In central and north-central counties, many larvae still are feeding in whorls. If control is warranted, time remains to get results. In northern Illinois, people should be scouting for corn borers for the next week and a half.

A recurring theme in some of the messages we received this past week was confusion regarding the management worksheet for first-generation European corn borer that was printed in issue no. 11 (June 7, 2002) of the *Bulletin*. We discovered the source of the confusion quickly, and we apologize for what may have been an oversight. An explanation is in order.

About 3 years ago, we made a slight but significant change to the worksheet for first-generation European corn borers. In the past, we recommended the following procedure for scouting and using the information in the worksheet:

- Examine 100 plants (10 consecutive plants at 10 different locations in a field) for shot-hole feeding in the whorl leaves.
- At each location, unroll the whorl leaves of an infested plant (one with shot-hole feeding) and count the live borers per plant.
- Calculate the percentage of plants infested and the average number of live borers per infested plant.

The figures derived from the calculation were used in the worksheet to determine the average number of borers per plant ( $\% \text{ of plants infested} \times \text{average number of borers per infested plant} = \text{average number of borers per plant}$ ). The change in the worksheet occurred after some lengthy discussions with fellow entomologists.

Following is the current recommendation for scouting first-generation European corn borers and using the information in the worksheet:

- Examine a minimum of 50 plants (10 plants at each of five locations in a field) for the presence of larvae. The number of plants examined is not as important as the fact that you are supposed to examine *every plant*, not just infested plants.
- \* Pull whorls from plants and unroll leaves to count live borers.
- \* Record the total number of larvae found and the total number of plants sampled.

You are supposed to unroll the whorls from all plants examined, not just an infested plant at each location within the field. By doing this, you don't need to know the percentage of plants infested because the average number of borers per plant is determined simply by dividing the number of borers found by the number of plants sampled.

The primary concern about the "old" approach was that people might underestimate densities of corn borers. For example, first-instar corn borers might be present in some plants that are not

exhibiting injury symptoms at the time of sampling. Although the newer approach probably provides a more precise estimate of the density of first-generation European corn borers, the older approach of unrolling the whorls of a subsample and then multiplying by the percentage of plants infested may be more time efficient for consultants.

Here's an example of how sampling the same field in two different ways can lead to different results. If you sample 100 plants, unroll all of the whorls, and find a total of 40 larvae, the average density is 0.4 larva per plant. If you sample the same 100 plants, 20% of which have evidence of infestation, and you happen to find only 1 larva in each of 10 infested plants sampled, the average density is only 0.2 larva per plant. Because you sampled only 10 infested plants and found only 10 larvae, you underestimated the density. You did not count the 30 other larvae in the plants that were not sampled.

We don't care if people use the older approach, especially if that's what they feel comfortable with. Obviously, consultants who have been scouting for European corn borers for a long time have some sense of how often mistakes are made. If the older approach resulted in few mistakes and is less time consuming, use the older approach. We simply wanted to clear up the confusion.

Please don't hesitate to let us know if you have any questions or concerns about our management guidelines. We invite all reasonable discussions about insect management.—Kevin Steffey and Mike Gray

### Corn Rootworm Larvae and Rescue Treatments

At this point in the summer, reports of corn rootworm larvae are becoming more common. Howard Brown, manager of agronomy services, Growmark, detected two corn rootworm grubs per plant while trouble-

shooting a field of uneven corn near Armington (southeast corner of Tazewell County). The field had been planted to soybeans last season. In the coming weeks, following the emergence of western corn rootworm adults, it will make very good sense to monitor densities of this pest in soybean fields. We've discussed many times how Pherocon AM traps can be deployed in soybean fields to help producers monitor densities of western corn rootworm adults. In the upcoming issues of the *Bulletin*, we'll revisit this topic and review the scouting protocol and thresholds used with these traps.

In the past week, a few folks have called and asked about rescue treatments for corn rootworm larvae. In some cases, people were not satisfied with the performance of their soil insecticide or they neglected to use any product in the first place. Keep the following factors in mind when deciding whether or not to attempt a rescue treatment. Soon after July 4, the first "flush" of corn rootworm adults will begin to emerge. Although root injury will continue to occur through mid-July in many fields, decisions regarding attempted "rescues" should be made very soon. In many fields, the corn is already too tall for any attempt to limit larval injury with ground application equipment. For the most part, rescue treatments do not work very well for corn rootworms. Furadan 4F and Lorsban 4E are products labeled for use against corn rootworms at cultivation. Of the two products, Furadan 4F is more water soluble and may move into the root zone more readily than Lorsban 4E. The efficacy of both products would be enhanced with precipitation following a treatment. The key factor in limiting larval injury is for product penetration to occur into the root zone. If an infested field can be irrigated, control also is likely to be enhanced following the application of a rescue treatment. Finally, keep in mind that many corn hybrids are capable of regenerating root tissue, especially if soil moisture is not limiting.—Mike Gray

## Lorsban 15G and Callisto Herbicide

In issue no. 11 (June 7, 2002) of the *Bulletin*, I included a brief article regarding a “Callisto advisory,” issued by Syngenta Crop Protection. It has come to my attention that Dow AgroSciences has issued a FIFRA Section 2(ee) label for Lorsban 15G that states: “Soil applied Lorsban 15G granular insecticide as a T-band application may be followed by post-applied herbicides such as Callisto herbicide.” I thought that you should be aware that there are two sides to the story regarding the interaction between Callisto herbicide and soil-applied insecticides.—*Kevin Steffey*

## Watch for Increasing Densities of Soybean Aphids During the Next Month

Findings of soybean aphids have continued throughout the upper Midwest during the past week. Scouting crews from the University of Illinois and Illinois Natural History Survey have found soybean aphids in Cook, Kendall, Lake, McHenry, and Winnebago counties. Although few aphids were found in any one field, the presence of small colonies on some plants indicates that population growth is under way. On June 19, Ron Estes, research specialist in agriculture in the Department of Natural Resources and Environmental Sciences, found aphids on 7 of 30 plants in one field in McHenry County, with as many as 6 aphids per plant. The soybeans were in the V2–V3 growth stages. The numbers of counties in which soybean aphids were found in surrounding states increased during the past week, but no one has reported finding significant numbers yet.

During the next month, everyone should keep their eyes on the growth of populations of soybean aphids. It’s very important to monitor increasing numbers of soybean aphids, but it’s equally important that we avoid over-reaction. Although soybean aphids are

colonizing small soybeans in Illinois this year, control measures typically are not warranted until aphid densities reach threatening levels on late-vegetative- or early-reproductive-stage soybeans. Between now and then, many factors can suppress populations of soybean aphids. As we have learned during the past 2 years, many natural enemies, especially the multicolored Asian lady beetle *Harmonia axyridis*, can reduce the number of aphids in a field. In addition, weather conditions during the next month may have a significant effect on soybean aphid populations. Asian literature indicates that soybean aphids reproduce faster when temperatures are below 81°F, so population growth may be slower if temperatures are high this summer. Heavy rainfall kills many aphids and may stop population buildup in some instances.

When you start looking for soybean aphids, make certain you identify them accurately. Other small insects, such as potato leafhopper nymphs, may also be found on soybean plants at this time of year. Soybean aphids are small (~1/16 inch), yellow-green insects with distinct black cornicles (“tailpipes”) on their abdomens. Check out Dave Voegtlin’s (Center for Economic Entomology, Illinois Natural History Survey) photographs at <http://www.inhs.uiuc.edu/cbd/aphid/photos.html>. It is rare to find any other species colonizing soybeans in North America, so it is safe to assume that colonies of tiny, yellow-green aphids on soybeans are the soybean aphid.

We recommend the following steps for monitoring soybean aphid populations in Illinois:

- Sample leaflets from at least 25 randomly selected plants in the field. The plants should be separated by at least 25 paces.
- Pull off a fully expanded trifoliolate leaf near the top of the plant and count the aphids on the middle leaflet. (Later in the summer you can sample leaves from the middle of the plant, too.)

- Calculate the average number of aphids per leaflet.
- If the average density of soybean aphids is 25 or more aphids per leaflet, return to the field in 5 days and resample the same general area to determine if the aphid population is increasing.

We have learned that the presence of alate nymphs (nymphs with “shoulder pads” that will develop into alates—winged adults) may be a sign that a soybean aphid population in a field is about to “crash,” (i.e., the density will decline dramatically). Stresses on the crop and crowding by the aphids cause a generation of winged adults to form. Therefore, a high percentage of alate nymphs within a field indicates the forthcoming occurrence of winged adults that will leave in search of other fields.

Once again, I remind you that treating an infestation of soybean aphids too early is not wise. We need to allow time for natural enemies and weather to exert their influences. Applying an insecticide too early will kill natural enemies, as well as aphids, after which populations of soybean aphids will resurge because of their incredible reproductive capacity. A resurgence of soybean aphids in a field might require another, costly insecticide application. So be patient. Watch the aphids for a few weeks, and be ready to act if necessary.—*Kevin Steffey*

## Japanese Beetle Reports Common in Soybeans and Cornfields

During the past week, we’ve received several reports of Japanese beetle infestations in corn, soybeans, and even rose gardens. On June 25, Kevin Black, with Growmark, observed an infestation of Japanese beetles clipping silks within a cornfield located near Waterloo, Monroe County. On June 18, Omar Koester, crop systems Extension educator, Randolph County, noted that Japanese beetles were common in many local soybean fields and

nearby suburban residents also were finding these attractive insects “munching” on their roses. Shawn Jones, field sales agronomist with Pioneer/DuPont, reported on June 25 that “moderate” numbers of Japanese beetles were showing up in cornfields located near Macon, Maroa, and Mt. Zion (all three communities located in Macon County). In addition, Shawn indicated that Japanese beetles could be found on some trees within residential areas of Decatur. Although many insect species are more selective when it comes to their diet, Japanese beetles are not “picky eaters.”

The Japanese beetle was first reported in the United States (New Jersey) in 1916. This insect pest has now spread into all states east of the Mississippi River, with the exception of Mississippi and Florida. Isolated pockets of Japanese beetles also have been reported in Missouri, Iowa, and Nebraska, as well as California, where it was apparently eradicated. Although most of our readers are concerned with the injury inflicted on cornfields and soybean fields, Japanese beetles also are pests of many ornamental plants and fruit trees. In the coming weeks of July, corn growers are urged to monitor their pollinating fields for Japanese beetle adults and their silk-clipping activities. In July and August, producers also are encouraged to monitor their soybean fields for defoliation caused by this insect pest. Let's take a look at a few commonly asked questions regarding the management of Japanese beetles in corn and soybeans.

*What's the easiest way to identify Japanese beetles?*

Adult Japanese beetles are “attractive” insects. They are shiny metallic green and have bronze-colored wing “covers.” Along the abdomen and below each wing cover, you'll find six tufts of white bristles. The adults are robust and reach approximately 1/2 inch in length. One cautionary note about the identification of Japanese beetles: Recently, Kevin Steffey observed large numbers of *false* Japanese

beetles near Arenzville, Cass County. These beetles are usually found in areas where soils are sandy. Although false Japanese beetles rarely, if ever, cause economic damage to crops, it is important to identify them correctly because they are often confused with Japanese beetles. False Japanese beetles are about the same size as Japanese beetles, have dull, coppery brown wing covers, and are dull green near the head end of the body. They do not have the characteristic arrangement of white tufts along the abdomen, as mentioned previously for the Japanese beetle. Control of false Japanese beetles is not recommended in agricultural crops in Illinois.

*How long will Japanese beetles be around this summer?*

These insects complete their development in 1 year throughout most regions of the United States. In northern New England, the entire life cycle of Japanese beetles requires 2 years. Female beetles deposit their eggs within the soil as early as mid-June and continue oviposition through August. After hatch, later in the summer, the first three larval instars feed on decaying vegetation and the roots of grass species. Overwintering is accomplished by the more mature larvae that move below the frost line. In the spring, larvae move upward in the soil profile and complete their development. Pupation most often occurs in May, and adults are often noticed for the first time in mid- to late June in Illinois.

*What thresholds should be used in corn and soybean fields?*

Although Japanese beetles may feed on corn leaves, the most significant economic threat they represent in corn is their potential to clip silks and interfere with the pollination process. Corn leaves that have been fed on are skeletonized or lacelike in appearance. The injury is very similar to that caused by corn rootworm adults. This leaf injury is almost never of any economic importance. Before making a treatment decision, the length and

maturity of silks should be estimated within a field. If three or more Japanese beetles per ear are found, silks have been clipped to less than 1/2 inch, and less than 1/2 of plants have been pollinated, a treatment should be considered. Economic thresholds for soybeans are based on the level of defoliation. A treatment should be considered when defoliation reaches 30% before bloom and 20% between bloom and pod fill.

*What products are labeled for control of Japanese beetles?*

In *corn*, the following treatments may be used as rescue treatments: \*Capture 2EC (2.1 to 6.4 ounces of product per acre), \*PennCap-M (2 to 4 pints of product per acre), Sevin XLR Plus (1 to 2 quarts of product per acre), and \*Warrior (2.56 to 3.84 ounces of product per acre).

In *soybeans*, the following treatments may be used as rescue treatments: \*Ambush (6.4 to 12.8 ounces of product per acre), \*Asana XL (5.8 to 9.6 ounces of product per acre), \*PennCap-M (3 to 4 pints of product per acre), \*Pounce 3.2 EC (2 to 4 ounces of product per acre), Sevin XLR Plus (1/2 to 1 quart of product per acre), and \*Warrior (3.2 to 3.84 ounces of product per acre).

Products preceded by an asterisk (\*) are restricted-use insecticides and may be applied only by certified applicators.—Mike Gray and Kevin Steffey

## Numbers of Grasshoppers Are Significant in Some Areas

It's been some time since we have experienced heavy infestations of grasshoppers in Illinois. However, the numbers of grasshopper nymphs being found around the edges of crop fields suggest that we need to pay attention to these avid herbivores this year. Kevin Black, with Growmark, reported that the numbers of grasshopper nymphs are high throughout southern Illinois. Mark Hoard, Extension IPM educator in Mt. Vernon, has re-

ceived sporadic reports of large numbers of grasshoppers. During a field trip to Cass County on June 21, Kevin Steffey, Extension entomologist at the University of Illinois, observed a significant number of grasshopper nymphs along the road next to a cornfield. There was no sign of grasshoppers having fed on the corn yet, but the numbers of grasshoppers were impressive.

If the weather continues to be hot and dry, we can expect grasshoppers to become problematic in some areas. As the weedy hosts on which grasshopper nymphs are feeding dry up, the grasshoppers will begin moving into field edges and feeding on corn or soybean plants. If hot, dry weather stresses the crops, feeding by grasshoppers will exacerbate the stress. Also, hot, dry weather is not conducive to the development and spread of a fungal organism that often suppresses grasshopper populations.

Following is information about grasshoppers and their management in Illinois. For more information (and photos) regarding grasshoppers, go to our IPM Web site (<http://www.ipm.uiuc.edu>), click on "Publications," click on "Books & Reports," and then click on "Corn Insect Pests." Scroll down to grasshoppers under "Knee-high to tasseling corn (V8 to VT)."

**Description.** The two most common grasshoppers in Illinois cornfields are the differential (*Melanoplus differentialis*) and redlegged (*Melanoplus femurrubrum*) grasshoppers. The differential grasshopper is a robust, olive-green to brown grasshopper that reaches 1 3/4 inches in length. The underside of the body is yellow, with complete, black chevrons (V-shaped "sergeant's stripes") on the femurs of the yellow hind legs. The redlegged grasshopper is red-brown and smaller (less than 1 inch in length) than the differential grasshopper. The hind legs are red with black spines.

**Life history.** In late summer and fall, females of both species deposit clusters of eggs in undisturbed soil

(noncultivated fields, roadsides, waterways, pastures). A female grasshopper can deposit an average of 200 to 300 eggs in her lifetime. Soil particles adhere to the frothy secretion that covers the eggs, forming a soil-covered egg pod. Both differential and redlegged grasshoppers overwinter as eggs in pods in the soil.

Nymphs begin hatching from eggs in May and June in Illinois. First instars are very small (~ 1/8 inch). Both species have five instars before they become adults. With adequate food and warm, dry weather, nymphal development requires 35 to 50 days. Both differential and redlegged grasshoppers complete only one generation per year.

**Injury.** Grasshoppers defoliate both corn and soybeans by tearing off and consuming plant tissue with their mandibles, giving the plant a ragged appearance. Defoliation can be extensive if densities of grasshoppers are large. Later in the season, grasshoppers also may feed on corn ears and soybean pods.

**Scouting and management guidelines.** Because grasshopper nymphs feed and develop first in noncrop areas, watch noncrop areas near field margins during June and July. While nymphs are feeding in noncrop areas, there is a "window of opportunity" for management. Nymphs are less mobile than adult grasshoppers because they lack functional wings. As vegetation in uncultivated areas bordering crops is mowed or dries out, nymphs begin to move into adjacent rows of corn, soybeans, or other field crops. If populations of nymphs average 15 to 20 per square yard in noncrop areas bordering a crop field, an insecticide labeled for use in these sites (see Table 1) can be considered.

Another management strategy is to wait until grasshopper numbers and levels of injury exceed established thresholds within the crop field. In soybeans, control might be warranted when defoliation reaches 30% before bloom or 20% between bloom and pod

**Table 1. Insecticides suggested for control of grasshopper in noncrop areas.**

Product	Amount of product per acre
*Asana XL	2.9 to 5.8 oz
Imidan 70W	2 1/8 to 2 3/4 lb
Sevin XLR Plus	1/2 to 1 1/2 qt

\* Use restricted to certified applicators.

fill. In corn, seven or more grasshoppers per square yard represents a potentially damaging population. In alfalfa, 15 to 20 grasshoppers per square yard might cause economic damage. Nymphs often succumb to fungal and bacterial diseases during periods of warm, humid weather. This wait-and-see strategy allows time for diseases to suppress populations before a decision is made to apply an insecticide.

We'll provide suggested insecticides for control of grasshoppers in alfalfa, corn, and soybeans in next week's issue of the *Bulletin*.—Kevin Steffey and Mark Hoard

### A Few "Thumbnail" Reports of Insects in Field Crops

Following are some brief reports of occurrences of insects and mites in Illinois.

- For issue no. 12 (June 14, 2002) of the *Bulletin*, I wrote an article regarding insects interfering with the activity of some postapplied herbicides. One of the insects was identified as a beetle larva, but at the time we were not certain what type of beetle it was. Mark Hoard, Extension IPM educator in Mt. Vernon, has identified the specimens I sent him as members of the family Anthribidae (fungus beetles). As the common name implies, many of these species are associated with fungus, so it's possible that the larvae we found were secondary invaders that came in after some other insect had excavated the marestalk stems. However, some species of Anthribidae

are known to feed inside weed stems, and they may have been responsible for the tunneling. As we learn more, we will share the information with you.

- Although grape colaspis injury did not seem to be widespread in 2002, this pest caused significant stunting and some stand reduction in some fields in western Illinois. In some instances, the symptoms of injury had been masked by the poor condition of the corn related to crummy growing conditions. After the corn began to grow, plants injured by grape colaspis remained stunted. I examined a field trial that the folks with Burrus Power Hybrids established near Arenzville in Cass County, and the differences between the untreated check and some of the plots treated with seed treatments and/or soil insecticides were quite noticeable. The data will be analyzed later this year, and we may be able to detect some significant differences among treatments.
- In last week's *Bulletin* (issue no. 13, June 21, 2002), I wrote a detailed article about potato leafhoppers. As it turns out, during the past week, we received numerous reports of large densities of leafhoppers in alfalfa, with some leafhoppers showing up in soybean fields. Omar Koester, Extension unit assistant (crop systems) in Randolph County, indicated that economic levels of potato leafhoppers were not "caught in time" on second cuttings in his area, and some yield loss occurred. Over the past couple of weeks, yellowing alfalfa fields have become more common. We urge you to scout for potato leafhoppers now, and be especially vigilant when the third crop begins to regrow after harvest.
- Kevin Black, with Growmark, observed twospotted spider mites in the margin of a soybean field near Carmi (White County) on June 25. The numbers were small, but their

presence in soybeans is worth noting. If the weather is hot and dry, population densities of twospotted spider mites will escalate rapidly.

Keep monitoring fields, and send us your reports.—*Kevin Steffey*

## WEEDS

### Postemergence Options for Waterhemp Management in Soybean

The time has arrived for applications of postemergence soybean herbicides. Questions about postemergence management of waterhemp in soybean are still common, so this article will summarize available management options, as well as some new findings related to this problematic weed species.

One of the most important factors for effectively managing waterhemp is to understand its germination and emergence characteristics. The germination and emergence patterns of waterhemp are characteristics that contribute significantly to management problems. While the peak emergence of other, more familiar summer annual weed species generally occurs during the early portion of the growing season, waterhemp emergence easily can occur during the middle to late portions of the growing season. Research at the University of Illinois has indicated that waterhemp can emerge during late June and even into early July. This characteristic generally results in a range of waterhemp plant sizes when postemergence herbicide applications are made. It is not unusual to treat waterhemp plants in a given field, ranging in size from 6 inches to less than 1 inch in height, for example.

### Application Considerations

The factors governing the effectiveness of postemergence herbicides are critically important when dealing with waterhemp. Herbicide rate, application timing, and spray additive all influ-

ence how well postemergence herbicides perform on waterhemp. Several application considerations deserve special attention, as these can greatly influence the level of waterhemp control achieved.

1. *Waterhemp plant size.* As previously described, waterhemp size can vary greatly in a given field when post-emergence herbicides are applied. Smaller plants (4 to 5 inches or less) are generally more effectively controlled with a given herbicide than are larger plants. The likelihood of waterhemp "recovering" from a postemergence herbicide increases as the plants become larger (greater than approximately 5 to 6 inches) prior to application.

2. *Carrier gallons.* Generally speaking, the more water the better. Applications of postemergence contact herbicides should be close to 20 gallons per acre. While glyphosate applications are usually made at 12 to 15 gallons per acre, increasing the carrier volume to 20 gallons may help provide better coverage, especially if the waterhemp population consists of a mixture of large (4 inches or larger) and small (1 inch or less) plants.

Often, producers like to wait as long as possible to apply postemergence herbicides, especially those that lack any significant soil residual activity, in order to have as many waterhemp plants emerged as possible. Remember that, because waterhemp can germinate and emerge for an extended time, a wide range of plant sizes typically exists by the time postemergence herbicides are applied. This can present problems with spray interception by smaller plants under the protective canopy of larger plants. Adjustments in spray volume (around 20 gallons per acre) and pressure (40 to 50 pounds per square inch) can help overcome some of the problems with coverage.

## Herbicide Options

Only four active ingredients for postemergence waterhemp control in soybean are available, and three of these belong to one chemical family. The diphenyl ether herbicides (PPO inhibitors) acifluorfen (Ultra Blazer), fomesafen (Flexstar), and lactofen (Cobra/Phoenix) are mostly contact in nature, and thus thorough coverage of the target vegetation is essential for good control. Waterhemp plants 4 to 5 inches in height (or less) are usually controlled better than larger plants. Each product label has some flexibility with respect to application rate and spray additives. When conditions have been hot and dry, application rates should be increased, and crop oil concentrate may enhance activity more than nonionic surfactant. Keep in mind that soybean injury may also increase when using crop oil concentrate.

The other postemergence soybean herbicide option is glyphosate. Glyphosate is very effective on waterhemp, but attention to plant size and application rate is still important. If waterhemp has been growing under good conditions (especially adequate soil moisture), control at a given application rate is frequently better than if the plants were growing under dry soil conditions. With no significant soil residual activity from glyphosate, waterhemp plants that emerge after application will not be controlled and may require further management considerations.

## Recent Problems

Diphenyl ether herbicides have been used extensively for waterhemp control in soybean, and while these herbicides in general are still effective for waterhemp control, some problems have developed. In particular, we have been investigating a population of waterhemp in Illinois that was not controlled by a postemergence application of lactofen, under greenhouse conditions. We applied Cobra at a rate equivalent to 20 fluid ounces per acre, plus crop oil concentrate, and did *not*

control most of the waterhemp plants from this population. We currently are conducting field experiments at the site from which our greenhouse population was collected, and will keep you informed as additional results become available. If resistance to this chemical family becomes more common, that could potentially reduce the number of viable postemergence soybean herbicides to one—glyphosate.

What else could go wrong, you ask? Over the past two growing seasons, we have received an increasing number of reports of glyphosate failing to provide adequate control of waterhemp. Other states have reported similar observations. While perhaps not always meeting the “criteria” for being designated resistant to glyphosate, lack of control for whatever reason presents a problem.

These examples are given to illustrate an important point. Waterhemp is a very diverse plant species, as is evidenced by the selection of biotypes resistant to ALS inhibitors, triazine herbicides, and PPO inhibitors. Anecdotal observations suggest the effectiveness of glyphosate for waterhemp control is not always as consistent as it once was. In years past, many new herbicide active ingredients were commercialized for the soybean market, but that has changed also. It is unlikely that many (indeed, if any) new active ingredients, with good efficacy on waterhemp, will be introduced into the soybean market during the next few years. If the effectiveness of any of the currently available postemergence soybean herbicides for waterhemp control (only four active ingredients, three of which are in the same chemical family) is reduced, new active ingredients may not be available to fill the need, at least for the foreseeable future.

Where can you go to learn more about waterhemp’s adaptability to our current management options? At Agronomy Day 2002 (August 22), Dr. Pat Tranel, from the Department of Crop Sciences, will present contempo-

rary research findings on the herbicide-resistance characteristics of Illinois waterhemp populations.—Aaron Hager and Christy Sprague

## 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, 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.

### East-Central Illinois

Corn plants look better, but fields look worse. Corn growth has finally taken off, but the more healthy plants are leaving stressed neighbors behind, resulting in some very ragged-looking stands.

*Insect activity:* One early-planted field in McLean County had 25% ECB whorl feeding and moths still flying. Japanese beetles are emerging, and potato leafhopper infestations are heavy in many alfalfa fields.

### **Northern Illinois**

Corn began to show heat stress last week, especially on the lighter soils. Some areas received rainfall on Tuesday, ranging from 0.3 to 2 inches, and scattered thunderstorms are expected on Wednesday. Corn plant populations are very uneven throughout the area. Some growers have been cultivating corn in fields that exhibit uneven plant height from the saturated soils in early June. In summary, the condition of the corn crop varies a great deal throughout the region. Postemergence herbicide application in soybeans began last week but some applications have been delayed due to heat stress. Late-planted soybeans are struggling and needed the recent rainfall.

No economic insect damage has been reported. However, potato leafhopper populations are increasing in alfalfa. Also, common stalk borer damage has been observed in corn border rows.

### **Southern Illinois**

Recent rains have been sporadic and heavy in areas. Corn is in the V7–V9 stages, with some evidence of European and southwestern corn borer damage. Reports of grape colaspis damage continue. Wheat harvest is complete, with variable yields. Beans are progressing well.

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