



PEST MANAGEMENT & CROP DEVELOPMENT

BULLETIN

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INSECTS

Corn Rootworm, Grape Colaspis, and Japanese Beetle Adults Are Emerging

The first report of western corn rootworm adult emergence has been reported by Randy Wright, graduate research assistant, in a University of Illinois research plot in Champaign County, so it's time to start watching for both northern and western corn rootworm adults throughout the state.

Western corn rootworm males emerge from the soil first, followed by western corn rootworm females. After emergence and mating, about 14 days elapse before the females begin laying eggs. Adult western corn rootworms are approximately 1/4 inch long. The background color for both males and females is yellow, but the two sexes differ somewhat in their markings. On males, much of each wing cover is black; only the tips of the wing covers are yellow. Females usually are slightly larger and have three distinct black stripes on the wing covers, one on the outside of each wing cover and one in the middle.

Adult northern corn rootworms emerge soon after emergence of adult western corn rootworms begins. Northern corn rootworms also are about 1/4 inch long, but they have no distinct markings. Newly emerged northern corn rootworms are cream or tan in color; they become green as they age. The females are slightly larger than the males.

Many cornfields will not be silking or pollinating when corn rootworm adults begin seeking food, so they will have to eat something other than their preferred food (silks and pollen). Both western and northern corn rootworms will feed on the epidermal layer of corn leaves and partially or totally strip the leaves of green tissue. This type of injury seldom is economically important, but it may look fairly ugly. The northern corn rootworm also will feed on the blossoms and pollen of many species of weeds.

The first reason to scout for rootworm adults in corn will be to watch for silk-clipping injury that interferes with pollination. This type of injury is especially critical in seed-production fields. In seed corn, treatment is justified if the silks on 20% of the plants have been clipped to a length of 3/4 inch or less, pollination is still taking place, and rootworm beetles are present. In commercial field corn, treatment may be justified if you find five or more beetles per plant, pollination is not complete, and silk clipping is observed.

The other reason to scout for corn rootworm adults in July and August is to assess the potential for injury in corn in 2001. Throughout the Midwest, corn planted after corn has the potential for corn rootworm damage every year, so scouting for rootworm adults in cornfields this year that will be planted to corn next year is very important. Also, in an ever-expanding area in Illinois, Indiana, Michigan, and Ohio (and possibly Iowa), where western corn rootworm adults lay eggs in soybeans, scouting for the adults in soybeans this year will give some insight about the potential for rootworm larval damage if corn is planted next year. For more information on monitoring soybean fields for western corn rootworm, refer to the article in last week's *Bulletin*.

Don Rhodes and Todd Burrus of Burrus Seed have reported finding grape colaspis adults in seed production plots, so anticipate adult feeding on corn leaves in the same fields in which the larvae injured the roots. At some point within the next few weeks, the adults will move into other crop fields, including alfalfa and soybeans, where they will continue to feed and lay eggs.

The tan grape colaspis adult is oval and about 1/6 inch long, with rows of tiny punctures on its wing covers, making them appear ridged. They may resemble newly emerged northern corn rootworm adults; however, northern corn rootworm adults have smooth wing covers that eventually turn green. Feeding by grape colaspis adults on corn leaves and silks and on leaves of alfalfa, clover, grape, soybeans, and strawberries causes no economic damage. They also feed on bull nettle and smartweed, and possibly other species of weeds.

We would like to keep track of when grape colaspis adults move into soybeans. Many of you will be scouting soybean fields for western corn rootworm adults, so consider watching for grape colaspis adults, too. If you find grape colaspis adults on yellow sticky traps, in sweep nets, or simply by observation, please let us know. Recording their numbers over time would be especially helpful.

Many of us will remember the very large numbers of Japanese beetles that occurred in corn and soybeans last year, especially in eastern and central Illinois. Well, we need to be ready for them again because early indications suggest they may be numerous in 2001. Omar Koester, crop systems unit assistant at the Monroe/Randolph Extension unit, reported the first Japanese beetles of the season in Monroe County on June 20.

We used to think of Japanese beetles as a problem experienced only by folks in east-central Illinois. However, that has changed in recent years. Our understanding is that Japanese beetles

have been reported around homes and gardens in most of the major cities in Illinois. Therefore, we should anticipate that they will show up in nearby crop fields and possibly spread from there. Let us know if and when you find these handsome, albeit irritating, insects this summer. We'll want to keep track of their distribution within the state.

We first reported Japanese beetles found in Madison County last year on June 22, so their emergence right now is occurring at virtually the same time. A sudden and significant attack of these insects in cornfields and soybean fields always seems to catch a lot of people by surprise. And homeowners will also enter the fray when they begin finding Japanese beetles in their flower and vegetable gardens and fruit trees.

The adult Japanese beetle is shiny metallic green, with hard, bronze-colored wing covers. Along each side of the abdomen, just below the wing covers, are six tufts of white hair. The adult is about 1/2 inch long. The beetles may feed on leaves if silks are not available; injured leaves appear skeletonized or lacy, similar to injury caused by corn rootworm beetles. However, leaf feeding is seldom economically important. An informational video on Japanese beetles is available at http://ipm.uiuc.edu/publications/videos/japanese_beetle/japanese_beetle.html. If you have a copy of our IPM On-Line Companion CD, remember to place it in your CD-ROM drive before viewing for a higher-quality video.

More importantly, Japanese beetle adults may clip a sufficient number of silks to prevent proper pollination. Control with an insecticide may be warranted if silks are clipped to less than 1/2 inch, less than 50% of the plants have been pollinated, and beetles are feeding. A rule-of-thumb economic threshold is three or more beetles per ear. Insecticides suggested for control of Japanese beetles in corn are *Capture 2EC at 2.1 to 6.4 oz per acre, *PennCap-M at 2 to 4 pt per acre,

Sevin XLR Plus at 1 to 2 qt per acre, and *Warrior T at 2.56 to 3.84 oz per acre. (The use of products preceded by an asterisk is restricted to certified applicators.)

As most of you know, the greatest concern regarding Japanese beetles is their feeding, sometimes in very large numbers, on soybean foliage. Although no one has reported finding Japanese beetles in soybean fields yet, you should be aware of the threshold, just in case the beetles show up in soybeans soon. Treatment may be warranted in soybeans during vegetative growth if defoliation reaches or exceeds 40%. The threshold decreases to 15 to 20% defoliation during flowering, pod set, and pod fill. Insecticides suggested for control of Japanese beetles in soybeans are *Ambush at 6.4 to 12.8 oz per acre, *Asana XL at 5.8 to 9.6 oz per acre, *PennCap-M at 3 to 4 pt per acre, *Pounce 3.2EC at 2 to 4 oz per acre, Sevin XLR Plus at 1/2 to 1 qt per acre, and *Warrior T at 3.2 to 3.84 oz per acre. (The use of products preceded by an asterisk is restricted to certified applicators.)—
Susan Ratcliffe and Kevin Steffey

European Corn Borer: First-Generation Update

So far this season, reports of European corn borer activity have been widely scattered throughout the state. In some areas of Illinois, the development of first-generation European corn borers appears to be highly variable as well. For instance, Matt Montgomery, crop systems educator, Sangamon and Menard Extension Unit, reported on June 19 that producers were finding corn borers that ranged from egg masses to those found in the midribs of corn plants. Andrew Larson, a science instructor at Black Hawk College in Kewanee, Illinois, reported on June 14 that a field of corn in Knox County was infested (30%) with European corn borer larvae (two per plant) that ranged in development from first to third instars. He also indicated that some borers had entered midribs of

corn plants. As we've reported numerous times, once corn borer larvae begin to occur in midribs, in very short order, they start to tunnel into stalk tissue. Once this development takes place, rescue treatments are no longer an effective option. Producers are urged to monitor their cornfields carefully for any signs of whorl feeding and midrib injury as soon as possible in central and northern Illinois counties.

Dave Walter, Walter Seed and Fertilizer, Grand Ridge, Illinois, has a network of pheromone traps deployed in LaSalle County. Dave reported that European corn borer moth captures from June 12 through June 17 exceeded 50 moths per evening in some trapping locations. This indicates that the egg-laying process is not over and scouting for first-generation larvae should continue in earnest for much of central and northern Illinois during the latter part of June. For a detailed description of scouting procedures, biology of corn borers, first-generation management worksheets, and suggested insecticides, please refer to issue no. 10 (June 1, 2001) of the *Bulletin*.

For producers in southern Illinois, Ron Hines, senior research specialist, Dixon Springs Agricultural Center, indicates that the second flight of European corn borers should begin by June 26 or 27. This prediction is based on projected heat-unit accumulations from the date of initial egg laying by the first flight of European corn borer moths. We'll notify you when Ron begins to catch moths from the second flight in his pheromone traps. We appreciate your reports on European corn borer activity. Keep them coming.—*Mike Gray*

More News About the Soybean Aphid

In last week's issue of the *Bulletin*, Mike Gray indicated that entomologists at the University of Minnesota believed they had found active soy-

bean aphid colonies in four soybean fields in a county in the southeastern region of the state. However, the species of aphids has not been confirmed by David Voegtlin, aphid specialist with the Illinois Natural History Survey. In the meantime, Chris DiFonzo, an extension entomologist at Michigan State University, has reported finding aphids on June 15 in a 3-acre research plot on the Michigan State University campus. The soybean plants were at stage V1. Among the aphids she found were an alate (winged adult) with four nymphs and three apterous (wingless) adults with 20 nymphs. Again, the species has not been confirmed by David Voegtlin.

These are small beginnings, but they are notable. And as I write this article, a couple of teams of entomologists and summer employees are on their way to survey for aphids in soybeans in northern Illinois. If they find anything, we will inform you as soon as possible.

You also might be interested in two Web sites that will include reports of soybean aphids this year. The Soybean Aphid On-line Reporting and Mapping System, described in the following article, is located at the North Central Pest Management Web site. Data at this Web site will come from states throughout the Midwest and will be rather specific. The Illinois IPM Web site also includes a reporting form for soybean aphids captured in our network of suction traps at seven locations in the state: <http://www.ipm.uiuc.edu/agriculture/soybeans/aphids/index.html>. Thus far we have not captured any flying soybean aphids. However, the report is updated weekly, so you might want to check it out when you get a chance.

As reports of aphids in soybean fields, confirmations of aphid species, and results from surveying and trapping accumulate, we'll provide the information in the *Bulletin*. Don't hesitate to contact us if you believe you have found aphids in soybean.—*Kevin Steffey*

Soybean Aphid On-line Reporting and Mapping System

The directors of the North Central Pest Management Center are pleased to announce that the Soybean Aphid On-Line Reporting and Mapping System is now available on the North Central Pest Management Web site: <http://www.pmcenters.org/Northcentral/start.html>. To access the system, you must click on the first icon (News Alerts) in the header and then select Soybean Aphid Alert under "Index of News/Alerts." This brings up the NC Pest Management Center's Soybean Aphid Watch Project 2001 (On-line Reporting and Mapping System) and related links. Select the Soybean Aphid Watch Project 2001 to activate the program. The homepage contains a map of the United States and several informational links, including a photo image library, the online reporting form, and a PDF version of the Soybean Aphid Regional Pest Alert fact sheet. Each state designated with a pink dot on the map is active for mapping reports of soybean aphid observations.

To ensure accurate identification and assessment of soybean aphid abundance during the 2001 growing season, the online reporting system is password protected and will be available only for individuals affiliated with research and Extension programs at land-grant institutions. However, you can view information about soybean aphid distribution and abundance by selecting a state with a pink dot and clicking to bring up that state's data page. On the right side of the state's page is a map that will reflect reports of aphids in the state based on date of first observation and abundance. This coded map will provide the visitor with a quick assessment of the aphid activity in the state. On the left side of the page is a map that links to the state's detailed reports that are available for each county. Select a county and click to view a list of all reported observations within that county. The

listing will include date of observation, aphid abundance, and location (including township and section number) for each reported observation.

We hope the reporting system is a useful source of information. Please let us know if you have any suggestions regarding how this electronic reporting system can be improved.—
Susan Ratcliffe, Mike Gray, and Kevin Steffey

Increase Your Vigil for Potato Leafhoppers

The hot, dry weather in a lot of areas of Illinois should encourage you to scout a bit more frequently for potato leafhoppers in alfalfa fields. Potato leafhoppers often cause more injury when the alfalfa plants are suffering from a lack of moisture. Matt Montgomery, Extension unit educator, crop systems, in Sangamon and Menard counties, reported that numbers of leafhoppers have reached and, occasionally, far exceeded economic levels in his area. Dave Feltes, Extension IPM educator in the Quad Cities, and Jim Morrison, Extension crop systems educator in Rockford, observed threshold levels of potato leafhoppers in some of their research plots in Stephenson County on June 15. Although we have not received many reports of alfalfa being treated for control of potato leafhoppers, I imagine that yellowing alfalfa may become more common soon.

In issue no. 7 (May 11, 2001) of the *Bulletin*, Mike Gray discussed potato leafhoppers in depth, including their appearance, the injury they cause, scouting techniques, economic thresholds, and suggested insecticides. As most of you know, a sweep net is essential if you want to manage potato leafhoppers in alfalfa effectively. All published economic thresholds are based on the numbers of potato leafhoppers per sweep. So, get that net out of the closet and check those fields. Don't wait until the alfalfa turns yellow and economic loss has already occurred.—*Kevin Steffey*

PLANT DISEASES

Plant Disease Musings

The disease situation has been pretty calm this season. So far we have had scattered occurrences of seedling blight on soybean, which was not too surprising, given the low germination scores of the seed this year. The wheat crop also escaped with very little damage from fungal disease, although this may have been because there weren't many leaves left after the armyworms visited. The corn crop is also starting off on a good foot from a disease-free perspective. Recent timely rains (or torrential, depending on your perspective), though, should keep you on your toes in scouting for foliar leaf blights in corn.

Common rust: The last two seasons saw quite a bit of common rust on field corn, which actually is quite "uncommon." This season I believe we will see a much more normal occurrence of this disease. We rarely worry about common rust causing many problems on field corn. Why? Because usually it doesn't show up with any density until we get into late July and that is past the point where it will make much difference in terms of final yield. Usually the only people who see it build up with any intensity are those who plant their favorite susceptible sweet corn right next to their field corn, and the sweet corn serves as an inoculum (spore) source to infect the field corn. Since we are seeing little development of this disease to the south, the airborne spores are not likely to reach here before their normal time.

Other fungal leaf blights: Our usual recommendation for all other fungal leaf diseases is to scout for them during the 2 weeks before tasseling to 2 weeks after tasseling. At that point you would be looking for about 15% whole-plant infection to justify a fungicide treatment. If fungal leaf blights should make a significant appearance before that point, what should you do?

First, consider the weather. Fungi in general need free water (on the leaves) and continued wet weather about every 7 to 10 days to flourish. Next, consider the probability of multiple fungal leaf blights developing in the field. Knowing what type of resistance is in the hybrid is pretty helpful to answer this. Is the field continuous corn with high residue? Fungal leaf blights are more likely to develop under those circumstances.

Why do you need to know all this other stuff to decide whether or not to spray field corn for an early fungal leaf disease? You need to know the probability of other fungal diseases developing later because there isn't a big arsenal of fungicides for treatment. Spraying early in the season may leave you with few options or none when "other" leaf blights become active. The price of corn and cost per application also need to be considered in your decision. The bottom line is that the fungicide treatments are effective if applied in a timely manner. Fungicides are useful when conditions favor diseases, especially if you are producing hybrid seed. Multiple applications may be necessary when disease pressures are high. However, during periods of high temperatures or dry conditions, disease pressures will be low and additional applications may not be necessary. Application and fungicide cost money. The price of corn is low. The risk is greater in seed corn than in field corn.

Disease resistance note: As with all resistant hybrids, keep in mind that resistance does *not* mean the hybrid will not be infected by the disease. Resistance in a resistant hybrid can be expressed in a number of ways. Commonly, the effect of resistance will be expressed something along the lines of smaller lesions produced, fewer spores subsequently produced from those lesions, longer time for lesions to develop, or fewer overall lesions produced. The resistant hybrids *will* develop lesions, but the lesions will not "look" the same as a characteristic lesion on a susceptible hybrid.—
Suzanne Bissonnette

CROP DEVELOPMENT

Nitrogen Loss Update

Most Illinois farmers demonstrated their concern about the environment and about the economics of crop production by delaying the application of anhydrous ammonia in the fall of 2000 until the soil temperatures were low enough to minimize the potential for nitrogen loss. Unfortunately, rains arrived at about the same time as the cool temperatures, prohibiting many farmers from getting their N on last fall. This created serious concerns about whether or not the fertilizer supply needed for the 2001 crop could be delivered on time to meet the needs. As it turned out, getting an adequate supply in a timely manner was not a problem, but the price was markedly higher. The high price was the result of the weather being colder than normal in December, which raised the price of natural gas; since ammonia production requires considerable amounts of natural gas, the price of ammonia was driven up as well.

Those farmers who had applied N earlier before the temperatures were cool enough were pretty smug about making a good decision—smug until the excessive late spring rains arrived and caused significant N loss through the processes of denitrification (N lost back to the atmosphere) and leaching (some N lost to the water supplies of the state). The exact amount of N lost is hard to predict, but it is estimated that those who applied N in early to mid-October probably had at least 90% of the N converted to nitrate by mid-May, if they didn't use a nitrification inhibitor, and 50% converted if they used an inhibitor. On the other hand, those who waited until November to apply the ammonia would have had less than 60 and 40% converted to nitrate if they did not and did use an inhibitor, respectively. This doesn't mean that they lost all the N that was converted, but if they had fields saturated with water for more than 5 days

in late May, they would probably have lost 25 to 40% of the nitrogen that had been converted.

Waiting until spring to apply N doesn't mean that it was safe from loss in all cases. Those who were able to apply in late March or early April and did not use a nitrification inhibitor may have experienced significant loss as well. If it was applied before April 10 without an inhibitor, as much as 50% of the N may have been converted to nitrate by mid-May. If they used an inhibitor with the early spring application, the conversion to nitrate by mid-May would have been in the range of 25 to 30%. Most (80 to 90%) of the ammonia that was applied after mid-April, with or without an inhibitor, would have still been in the ammonium form by the time the excess rains occurred in late May.

Farmers that have observed N deficiency in their fields in 2001 should consider applying additional N. Prior research has shown that yield response to additional N will occur when N is applied up to tasseling or a little after, providing that rain is received to move the N down into the soil. On most fields, an additional 60 pounds N per acre will be adequate to optimize yield. However, one should calculate the potential amount of N lost by taking the amount of N applied times the estimated percentage of N nitrified (given in the preceding paragraphs) and then multiply that number times 0.05 for each day the field has been saturated. That will give the estimated pounds of N lost. If the number is less than 40, no additional N is suggested. If the number is between 40 and 80, apply an additional 60 pounds of N, and if the number is over 80, apply an additional 90 pounds of N. As an example, assume that 190 pounds of N (amount recommended for that field) was applied on October 10, 2000, without a nitrification inhibitor and that the field has been saturated with water for 8 days. The calculation to determine if additional N is needed would be: $190 \times 0.9 = 171$ pounds converted to nitrate; soil was saturated for 8 days— $171 \times 0.05 \times 8 = 70$ (68)

pounds lost. Consider applying an additional 60 pounds N. Be sure to dribble the N between the rows, keeping it off the vegetation. If the same field had received the same treatment with a nitrification inhibitor 1 month later, the calculation would be: $190 \times 0.40 = 76$; $76 \times 0.05 \times 8 = 30$. In this case, no additional N would be needed.—*Robert G. Hoefl*

REGIONAL REPORTS

Extension center educators, unit educators, and unit assistants in northern, west-central, east-central, and southern Illinois prepare regional reports to provide more localized insight into pest situations and crop conditions in Illinois. The reports will keep you up to date on situations in field and forage crops as they develop throughout the season. The regions have been defined broadly to include the agricultural statistics districts as designated by the Illinois Agricultural Statistics Service, with slight modifications:

- North (Northwest and Northeast districts, plus Stark and Marshall counties)
- West central (West and West Southwest districts, and Peoria, Woodford, Tazewell, Mason, Menard, and Logan counties from the Central district)
- East central (East and East Southeast districts [except Marion, Clay, Richland, and Lawrence counties], McLean, DeWitt, and Macon counties from the Central district)
- South (Southwest and Southeast districts, and Marion, Clay, Richland, and Lawrence counties from the East Southeast district)

We hope these reports will provide additional benefits for staying current as the season progresses.

East-Central Illinois

Moth mania is slowing down. A wave of calls moved northward across the region over the last 2 weeks as armyworm moth flights peaked. Mixed in

with the armyworms in varying amounts were black cutworms, corn earworms, and variegated cutworm moths. We received the first reports of Japanese beetle activity this week from Vermilion County. First- and second-instar European corn borer larvae can be found in cornfields but, so far, only on a few scattered plants.

Northern Illinois

Corn growth rate has increased substantially due to the warmer temperatures, and corn plants are exhibiting a darker green color. Soybean postemergence herbicide applications and some cultivating of corn have been the major activities during the past week.

Potato leafhopper populations need to be monitored in alfalfa to prevent unnecessary injury. Extension educators Jim Morrison and Dave Feltes reported finding potato leafhoppers last week at the Stephenson County alfalfa plots. Only a few plots had economic infestations at that time, but leafhopper populations can build up rapidly.

Southern Illinois

Warm temperatures allowed a rapid accumulation of heat units. Cornfields added three leaves in the past week, and early corn is quickly approaching VT. Early-planted soybeans have already reached R1. There have been some spotty rains, but most fields are again short on topsoil moisture.

Wheat harvest has gone from start to nearly done in the last week. Yields are somewhat variable, but often better than average. Test weights have been good. A majority of the stubble fields are already doublecropped to soybeans.

One-spotted stinkbugs have been found damaging some cornfields. Southwestern corn borer moth flights have declined in far southern Illinois but remain high in Franklin County. Limited ECB has been observed in early corn. Small grasshoppers are numerous.

West-Central Illinois

Warm and dry weather has continued in the region, but with the recent abundance of rainfall, corn and soybean do not yet show any major heat or drought stress.

Corn is growing rapidly and taking on a good dark green color. Some March-planted fields are reported to be in the tasseling stage (VT). Postemergence herbicide applications are being completed. Very few insect problems have been observed during the past week.

Soybean development is also progressing rapidly, with some fields in V3 to V5 stage. Roundup and other postemergence herbicides are being applied. Some cultivation is being done also. Various seedling diseases are showing up as a result of recent wet soils. Planting is being completed in the extreme southern areas of the region.

Wheat harvest has begun with average yields reported. Seed quality is good since there wasn't much disease. Conditions are ideal for early double-cropping.

Second-cutting alfalfa is being harvested. Farmers are reporting good quality with few insect problems at this time.

Since most fieldwork has been completed, some farmers are mowing ditches and roadsides.

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