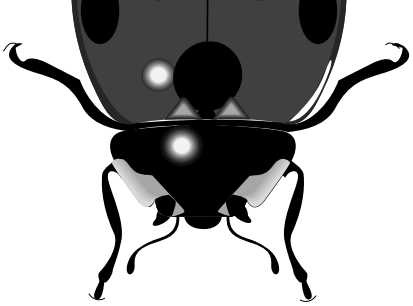

PEST MANAGEMENT & CROP DEVELOPMENT

BULLETIN

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No. 9 / May 21, 1999

Executive editor: Kevin Steffey, Extension Entomologist

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In This Issue

Mark Your Calendars for the 1999 University of Illinois Agronomy Day—August 26

On August 26, 1999, the 43rd Annual Agronomy Day will take place at the Crop Sciences Research and Education Center (South Farm) beginning at 7 AM. Tours begin every 30 minutes between 7 AM and 12 noon. This program serves as an annual showcase for faculty to discuss their latest research findings with clientele throughout Illinois and also from neighboring states. The theme for this year's event is *Agriculture for the New Millennium*. The Department of Crop Sciences, in cooperation with some other units on campus, will feature four separate tours, with approximately five speakers at each tour. Topics to be offered at this year's program include the following:

Tour A

- Genes from Wild Soybeans
- Virus Diseases in Small Grains
- Increasing Antioxidants in Corn Grain
- The Chromosomes of the Soybean
- Losing by Winning: Competition Among Corn Plants

Tour B

- Soybean Cyst Nematode: Detection and Management
- Sudden Death Syndrome: Can We Manage This Serious Disease of Soybean?
- Transgenic Crops for Insect Management: Potential Benefits and Pitfalls
- Soybean Insects Friends and Foes
- Rotation-Resistant Corn Rootworms
- Corn Earworm Management in Seed Corn

Tour C

- Phosphorus and the Environment
- Ammonium Sulfate: When Should It Be Applied?
- Does Herbicide Injury Reduce Soybean Yield?
- Weed Management in Herbicide-Resistant Crops
- Waterhemp—A Perennial Headache from an Annual Weed

Tour D

- On-Tractor Information Manager
- OxyDiesel Fuel for a Cleaner World
- Water-Table Management—A Tool for Optimized Yield and Improved Water Quality
- Aerial Infrared Mapping of Field Tile
- On-the-Go Soil Nitrate Sensing

In addition to the tours, numerous educational displays will be featured beneath the orange and blue "big top." Presenters will be available to answer questions about the displays. So plan for an interesting excursion to the field and through the displays and exhibits. For just $4.00, you can purchase a

lunch ticket at the registration table in the tent. During lunch, participants are encouraged to continue discussions with speakers and solicit answers to any lingering questions that may not have been addressed on the tours. Finally, if you have any questions about the program, please give Sharon Conatser, (217)333-4424, or myself, (217)333-6652, a telephone call; our e-mail addresses are sconatse@uiuc.edu and m-gray4@uiuc.edu. Both Sharon and I are coordinating this year's event, along with Bob Dunker, Farm Superintendent of the Crop Sciences Research and Education Center (South Farm). At last year's program we broke attendance records for the last decade or so. Please join us this year to help celebrate the last Agronomy Day of this century.—*Mike Gray*

INSECTS

Black Cutworm Cutting Occurring in Champaign and Douglas Counties

David Brummer, KSI Laboratories, Shelbyville, reported (5/18) that corn plants were being cut in some cornfields of Champaign and Douglas counties. These observations match up nearly to the day of our projected cutting dates for both these counties based on intense flights of black cutworm moths that occurred in mid-April (see Table 1, issue no. 6). In the rush to finish corn planting and begin planting soybeans, don't overlook the potential for serious injury that can result from feeding by this sporadic insect pest. Cornfields in the 1- to 4-leaf stage of development are especially prone to economic injury. Invest some precious time to walk your fields; this effort could be well worth the effort. The next two to two-and-a-half weeks will be a critical period to pay black cutworms some respect throughout much of the state.—*Mike Gray*

Wireworms Have Captured Some Attention

Highlights:

- Wireworm infestations are common in some areas of south-southwest and south-central Illinois.
- Explanation of wireworm biology and chronic wireworm problems.
- Request for information about fields with wireworm infestations.

We have written about wireworms in several previous issues of the *Bulletin*, so this article is simply a status report. Duane Frederking, with Pioneer Hi-Bred International, reported that wireworm problems are relatively numerous in his area of south-southwestern and mid-southern Illinois. The larvae have attacked planted seeds and underground portions of seedling stems. The result in some fields has been significantly reduced plant populations, and some fields require replanting, at least in spots.

Wireworm problems are often difficult to predict. If a grower plants corn into former grassland, a wireworm problem is almost assured. However, what about the farmer who experiences wireworm problems in corn planted after soybeans in a field with no history of wireworm problems and no grassy weed problems? Your guess is as good as ours. Wireworm biology is still mysterious to many of us, and we can't seem to predict their occurrence with great accuracy. Dr. Armon Keaster, University of Missouri, is the most renowned wireworm expert in the Corn Belt. He and Dr. Thomas Riley co-authored *A Pictorial Field Key to Wireworms Attacking Corn in the Midwest*, and they provided some insight about wireworm biology. "Wireworm injury to crops usually occurs either after grassland has been converted to cultivated land or in fields with chronic infestations that are left uncontrolled for several years." Maybe the latter situation explains some of the problems.

The adults of wireworms, called click beetles, deposit eggs in the soil of grassy areas or cultivated fields, and the larvae require from one to several years to develop into adults. Consequently, wireworms can be problematic in the same field for more than one year. However, as Keaster and Riley pointed out in their booklet: "Most damage occurs when large populations contain a high percentage of mature or almost mature larvae." If this is what you are encountering, then it is likely that wireworm larvae have been present in the field for some time.

Refer to last week's *Bulletin* (issue no. 8, May 14, 1999) for information about replanting and controlling wireworms. Also remember that when the soil warms up appreciably, wireworm larvae will move downward in the soil, and we won't find them again for the rest of the year.

One final note: We are interested in obtaining information about fields that have relatively severe infestations of wireworms, particularly if replanting is occurring. John Shaw, research scientist in the Center for Economic Entomology at the Illinois Natural History Survey, is seeking a field in which to conduct a wireworm insecticide efficacy trial. In the past, we have placed such trials in infested fields that required replanting. If you have any knowledge about such fields, please contact John at (217)244-5124 or at jt-shaw@uiuc.edu. He'd like to hear from you.—*Kevin Steffey*

Soil Heat-Unit Accumulations and Corn Rootworm Egg Hatch: Stay Tuned

Observations of lightning bugs have become more numerous during the past week. As many of our readers know, these sightings have been closely linked to the beginning of the annual hatch of corn rootworm eggs. Although these two biological events are not related or linked in any way, they are both temperature dependent.

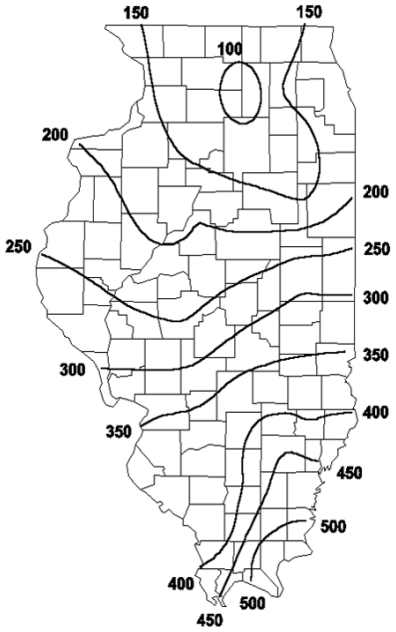

Figure 1. Actual 4-inch soil-temperature heat-unit accumulation (base 52˚F), January 1 to May 17, 1999. (Map provided by Robert Scott, Illinois State Water Survey.)

As indicated in last week's *Bulletin,* laboratory studies have shown that when 380 to 426 heat units (base 52˚F) have accumulated, as many as 50 percent of the eggs are likely to have hatched. Figure 1 reveals that as of May 17, between 200 and 300 heat units (base 52˚F, 4-inch soil temperature) had accumulated across central Illinois. As mentioned last week, by May 25, corn rootworm egg hatch should be well under way across most cornfields of central Illinois. Cooler temperatures during the second half of this month may delay the hatch somewhat; however, egg hatch this season is likely to mirror that of last year. We'll keep you posted on this issue for the next several weeks.—*Mike Gray*

European Corn Borers: An Overwintering Story

On Monday (5/17) morning, I received a telephone call from Vernon Campert, Pioneer Hi-Bred International, Inc., Pinckneyville, Perry County. Late last summer, Vernon placed some corn borer larvae in a plastic bag and used them at several educational meetings with his customers. At the end of the field-meeting season, Vernon tossed the plastic bag in his pickup and never gave the corn borers much thought until this spring. In retrieving some loose change beneath the seat of his truck, Vernon came across the plastic bag. To his amazement, the corn borer larvae were doing just fine! I indicated to Vernon that overwintering conditions in his pickup were probably less severe than within a cornstalk out in a field. As Kevin indicated in an article in last week's *Bulletin,* don't be surprised if you see a few corn borer moths in the next week or so. Already, several unconfirmed reports have been passed along from southern counties. Last year, corn borer moths were observed in northern Illinois as early as mid-May. As soon as we confirm some sightings of moths, we'll begin projecting corn borer phenology for the remaining portion of the growing season.—*Mike Gray*

The Stalk Borer Watch Continues

In last week's *Bulletin* (issue no. 8, May 14, 1999), Mike Gray offered the opening salvo of information about stalk borers and the threat they pose to corn. After discussing their biology and appearance and the injury they cause, he provided information about tracking their movement by accumulating heat units above a base temperature of 41˚F. An update on accumulated heat units is provided in Figure 2, which shows heat-unit accumulations from January 1 through May 17. Stalk borers first begin to move into corn when 1,100 heat units accumulate; 50 percent movement occurs when about 1,400 to 1,700 heat units accumulate. The map in Figure 2 suggests that movement into border rows of corn could have begun anywhere in the southern one-third of the state. We recommend scouting for stalk borers when about 1,300 to 1,400 heat units have accumulated, so everyone south of I-70 should be alert for early signs of stalk borer injury.

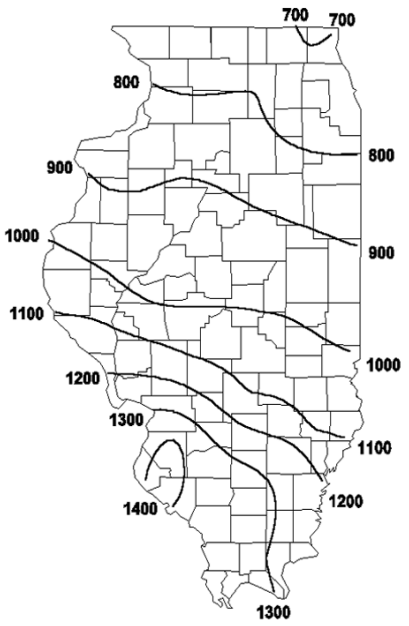

Figure 2. Actual heat-unit accumulation (base 41˚F) from January 1 to May 17, 1999, for estimating development of stalk borers. (Map provided by Robert Scott, Illinois State Water Survey.)

Insecticides for stalk borer control were published in last week's issue of the *Bulletin* (issue no. 8, May 14, 1999). Remember, these insecticides will be effective only if they contact larvae during their movement from plant to plant and while the larvae are relatively small. After the stalk borers bore into the plants, they are difficult to control. Timing is everything.—*Kevin Steffey*

Status of Alfalfa Weevil Development

We're at the time of year when a lot of additional information about alfalfa weevils offers nothing new. In several previous issues of the *Bulletin,* we have discussed alfalfa weevil identification, biology, status, and management, including early cutting and application of insecticides. We have provided information about the parasitic wasps *Bathyplectes curculionis* and *B. anurus* and the fungus *Zoophthora phytonomi*. However, few people have reported any significant

effects attributed to these natural enemies. On Monday, May 17, I observed a pupa of *Bathyplectes curculionis* within the netlike cocoon of an alfalfa weevil in a field in Champaign County. However, I also observed a significant level of injury; obviously, the impact of natural enemies in that field was not great enough to keep weevils below economic levels.

Heat-unit accumulations (base 48˚F) from January 1 through May 17, 1999, are shown in Figure 3. The second peak of third-instar alfalfa weevils (575 heat units) should have occurred throughout the southern two-thirds of the state. Development of alfalfa weevils is progressing rapidly in northern Illinois. By May 31, 1999, accumulated heat units throughout the state will be well beyond the need to measure (Figure 4).

A lot of alfalfa has been cut, and as I mentioned in last week's *Bulletin* (issue no. 8, May 14, 1999), early

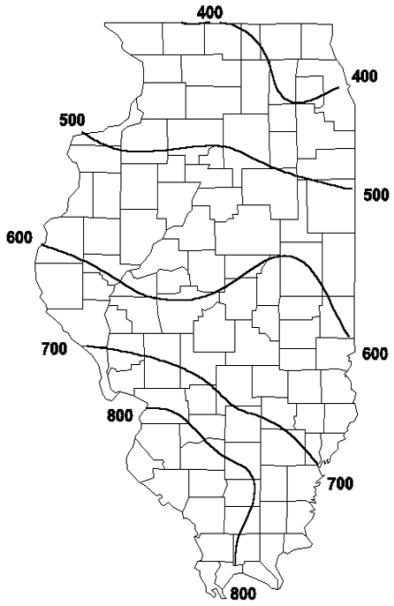

Figure 3. Actual heat-unit accumulations (base 48˚F) from January 1 through May 17, 1999, for estimating development of alfalfa weevils. (Map provided by Robert Scott, Illinois State Water Survey.)

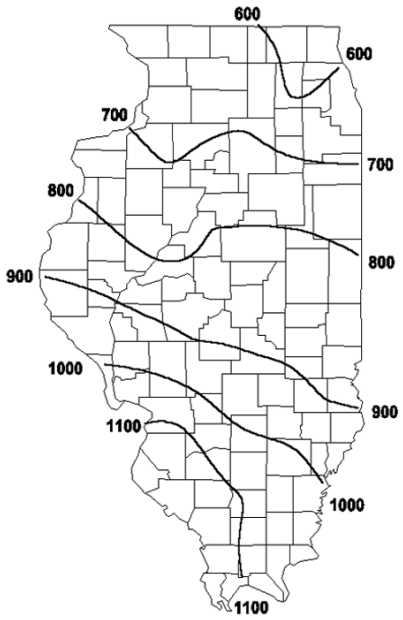

Figure 4. Projected heat-unit accumulations (base 48˚F) from January 1 through May 31, 1999, for estimating development of alfalfa weevils. (Map provided by Robert Scott, Illinois State Water Survey.)

cutting can be as effective as an insecticide for managing alfalfa weevils. I reiterate to all alfalfa growers who have cut their hay: Watch the regrowth carefully to make certain that weevils don't cause any more trouble. Look for mature larvae and new adults in the stubble for several days after cutting. If 50 percent of the stubble is defoliated for 3 to 5 days, an insecticide may be warranted. Also keep in mind that as soon as we finish with this first crop of alfalfa and get our second crop under way, the next nemesis—potato leafhopper—moves to the top of our list of concerns. Stay tuned.—*Kevin Steffey*

WEEDS

Delayed Preemergence Corn Herbicide Applications

Soil-applied herbicides continue to be widely utilized for weed management in Illinois cornfields. Of the planted acres scheduled to receive some application of a soil-applied herbicide, most were treated prior to planting or prior to corn emergence. It is likely, however, that some cornfields were planted before the herbicide was applied and the crop has already emerged. Can a soil-applied corn herbicide be applied after the crop has emerged? Many, but not all, soil-applied corn herbicides can be applied even after corn emergence. Not all of these herbicides will control emerged weeds, so additional management procedures may be needed. Atrazine, cyanazine, and premixes containing these herbicides can provide postemergence control of certain annual broadleaf (2 to 3 inches) and grass (1.5 inches or less) weed species. Table 1 contains information about postemergence applications of the more traditional soil-applied corn herbicides. Consult the respective product label for additional information.—*Aaron Hager, Marshal McGlamery*

PLANT DISEASES

Septoria Leaf Blotch on Wheat

Marion Shier, Crop Systems Educator in Livingston County, reports Septoria leaf blotch on wheat in the area. Shier indicated that the wheat was already headed and the leaf blotch was infecting the flag and flag-1 leaves. See issue no. 6 of the *Bulletin* to estimate probable yield loss from fungal leaf diseases.

Septoria leaf blotch is caused by the fungus *Septoria tritici.* The fungus produces tan-colored, oval-shaped lesions on the leaves. As the lesions mature, small, black specks can be seen in the lesion. The specks are the fruiting structures of the fungus called pycnidia. During periods of high moisture, the pycnidia will produce spores and the spores are splashed up to successive leaves on the plant, usually by rain. Effective fungicide controls for leaf blotch are not labeled for use after Feeke's growth stage 10.5. The only thing that will keep disease levels from leaf blotch down beyond growth stage 10.5 is dry weather.—*Suzanne Bissonnette*

Table 1. Maximum corn size for postemergence applications of soil-applied herbicides.

Herbicide	*Maximum corn size*
Atrazine	12 inches
Dual II Magnum	up to 40 inches
Bicep II Magnum, Bicep Lite II Magnum	5 inches
Bicep Magnum TR	2 inches
Surpass 100, Surpass, TopNotch, FulTime, Harness, Harness Xtra	11 inches
Bullet	5 inches
Frontier, Guardsman, LeadOff	8 inches
Micro-Tech, Partner	5 inches
Bladex 90DF	4 leaf
Extrazine II 90DF	4 leaf
Python	2 inches
Princep	before corn emergence
Prowl	depends on tankmix partner
Broadstrike + Dual	2 inches
Hornet	20 inches
OpTill	8 inches
Axiom	before corn emergence
Balance	before corn emergence
Epic	before corn emergence
Contour	12 inches
Sencor	depends on tankmix partner

It's Time to Scout for Needle Nematode Damage

Damage caused by the needle nematode can become evident as early as 2 weeks after seedling emergence. Aboveground symptoms consist of scattered patches of stunted and nutrient-deficient (nitrogen, phosphorus, and potassium) plants. These patches are usually oval to oblong in shape with the most severely damaged plants in the centers and diminishing toward the edges to normal-appearing plants. These symptoms are most pronounced in late May and throughout the month of June.

Belowground symptoms are typically most obvious on the seminal and first crown roots of seedlings. When plants are dug, the roots may appear discolored; lateral roots may be short, stubby, swollen at the tips, and lacking fine feeder roots, giving the overall root system a coarse appearance. Root symptoms often resemble DNA-herbicide carryover.

The needle nematode has been found only in soils containing 50 percent sand or more, but damage is greatest in soils containing 90 percent sand. When soil moisture is high, the nematode often occurs in abundance in the upper 4 inches of soil, causing the early damage to the root system. Populations are concentrated at lower depths as the season progresses, and the nematode may not be detected in the top 6 inches of soil by the end of the growing season; consequently, the sampling depth should be increased to 9 to 10 inches from the middle to the late part of the growing season.

Several other problems, including insect feeding, compaction, herbicide damage, and nutrient deficiency, can be confused with nematode damage. Therefore, to diagnose needle nematode problems, it is important that you obtain a good soil sample. Samples can be collected from an entire field or from patches of obvious damage. If samples are collected from problem patches, use a core sampler and take samples at the margin of the damaged area to the appropriate depths mentioned above. Do not collect the soil probes from the center of the damaged areas; the reduced root mass caused by nematode feeding can result in fewer feeding sites there and thus fewer nematodes being present. Sampling an entire field is beneficial because it provides a more realistic picture of field-wide nematode distribution than sampling only pockets or patches of damage. In this case, each sample should represent about 10 acres and consist of 12 to 24 probes or subsamples. Sampling should follow a zigzag pattern. After the subsamples are gathered and mixed, a sample of 1 quart and a handful of roots should be sealed in a sturdy plastic bag. The sample should be kept cool (less than 80˚F) and submitted to the University of Illinois Plant Clinic or other appropriate diagnostic laboratory as soon as possible. Essential background information on the problem should be included on a nematode sample form. (For more information on collecting soil samples, refer to *Report on Plant Disease*, No. 1100, "Collecting and Shipping Soil Sample for Nematode Analysis," available from the Department of Crop Sciences, N-533 Turner Hall, 1102 S. Goodwin Ave., Urbana, IL 61801. The cost is $1.00 per copy.)

Infestations of the needle nematode along the Illinois River have been found on first-year corn that had followed a grass cover. In other areas, the nematode was recovered in substantial numbers from fields of continuous corn. Although the nematode has been found in a few fields of soybean that were rotated with corn, there is no evidence that soybean is a host. The nematode was rare or absent in soil samples from soybean and dicotyledonous vegetable crops but present in low numbers on corn and other graminaceous crops that had been rotated with those crops. The host range appears to be restricted to the grass family. Consequently, the nematode can be controlled by rotating out of grass crops to soybeans or dicotyledonous vegetable crops often grown on irrigated sands. Because most grassy weeds are hosts of the needle nematode, it is necessary to control them when the nonhost crop is used in the rotation.

Nematicides registered on corn have not been effective against the needle nematode. Therefore, it appears that the use of crop rotations may be the most logical approach. For more information on crop rotations, please contact Dale I. Edwards at (217)244-2011.—*Dale I. Edwards*

Contributing Authors

Suzanne Bissonnette (bissonnettes@mail.aces.uiuc.edu), Champaign Extension Center, (217)333-4901

Dale I. Edwards (diedward@uiuc.edu), Extension Nematology, (217)244-2011

Mike Gray (m-gray4@uiuc.edu), Extension Entomology, (217)333-6652

Aaron Hager (hager@uiuc.edu), Extension Weed Science, (217)333-4424

Marshal McGlamery (mcglamerym@ces.aces.uiuc.edu), Extension Weed Science, (217)333-4424

Kevin Steffey (ksteffey@uiuc.edu), Extension Entomology, (217)333-6652

U of I Extension Newsletter Service
University of Illinois
at Urbana-Champaign
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