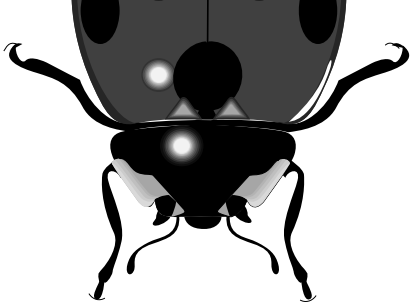

PEST MANAGEMENT & CROP DEVELOPMENT

BULLETIN

FOR IMMEDIATE RELEASE
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Mark Your Calendars Now for the 2002 Agronomy Field Days

Each summer, the Department of Crop Sciences sponsors several field days at multiple locations throughout Illinois. These events offer a great opportunity for members of the agricultural community to interact with scientists who are conducting research at these sites. Topics at each location focus on important crop production and protection issues facing farmers. The presentations are offered in a very informal setting, and participants have a great opportunity to get their questions answered by faculty and staff of the Department of Crop Sciences. The Ewing Field Day is organized by the University of Illinois Extension crop systems educators who are located in southern Illinois. The Research and Education Center at Belleville is operated by Southern Illinois University. Following is logistical information for each field day. If you have any additional questions about these events, please call Sharon Conatser, Department of Crop Sciences, at (217)333-4424. The contact person for each event also is provided. Please give any of these folks a call if you would like more specific information about a given program.—*Mike Gray*

Location	*Date*	*Time*	*Meal*	*Contact*
Urbana—Weeds	June 26	8:30 AM	Lunch	Doug Maxwell (217)265-0344
DeKalb—Weeds	July 11	5:00 PM	Dinner	Lyle Paul (815)824-2029
Belleville	July 11	9:00 AM	Lunch	Ed Varsa (618)453-2496
Brownstown	July 25	3:00 PM	Dinner	Adam Anderson (618)427-5239
Dixon Springs	August 1	7:00 AM	Breakfast	Steve Ebelhar (618)695-2790
DeKalb	August 7	4:00 PM	Dinner	Lyle Paul (815)824-2029
Orr Center	August 13	9:00 AM	Lunch	Glenn Raines (217)236-4911
Monmouth	August 20	8:00 AM	Snack	Eric Adee (309)734-7459
Urbana	August 22	7:00 AM	Lunch	Sharon Conatser (217)333-4424
Ewing	September 5	9:00 AM	None	Dennis Epplin (618)242-9310

INSECTS

European Corn Borer Update

We've had several articles in the *Bulletin* concerning the importance of scouting for European corn borer first-generation injury. Hopefully the advice has been heeded by many folks in the southern one-third of the state. Kevin Black, Growmark Company, reported on June 18 that many cornfields in southern Illinois are supporting healthy densities of first-, second-, and third-instar European corn borer larvae. Kevin indicated that most of the larvae were in the second-instar stage; however, many borers were moving into the midribs. This is a very good field-level signal that tunneling into stalks is occurring in some fields. Folks in central and northern Illinois also should begin to "dust" off their corn borer scouting skills and examine fields for whorl-feeding injury. Matthew Heisner, a summer intern in the Department of Crop Sciences, reported that he observed many moths in his father's oat field in DeKalb County that was being harvested. The oats were likely serving as a very suitable action site for the moths—at least prior to the harvest. European corn borer fall surveys conducted last year revealed large overwintering densities in northern and east-central Illinois counties. So, producers, particularly in these areas, should not ignore the potential for economic infestations this summer. Let us know the results of your scouting efforts!—*Mike Gray*

Caterpillars in Corn Whorls

During June, many people focus on looking for whorl-feeding injury while scouting cornfields for first-generation European corn borer (refer to preceding article). As you scout, keep in mind that several species of caterpillars can be found feeding in corn whorls. First-generation southwestern corn borers require attention in southern Illinois, and first-generation European corn borers can be found throughout the state. Other caterpillars—armyworm, corn earworm, fall armyworm, stalk borer, yellowstriped armyworm—also feed in corn whorls, so you should be able to distinguish among these species.

For the most part, European and southwestern corn borer larvae cause similar injury to corn whorls. The injury becomes evident as leaves unroll from the whorls—pinhead-sized or small, circular holes to "windows" on leaf surfaces to large, elongated holes. Fine, sawdustlike frass (caterpillar excrement) usually can be found in the whorls. The leaf injury caused by armyworm, corn earworm, fall armyworm, stalk borer, and yellowstriped armyworm larvae is more ragged than injury caused by corn borers, and the frass is messier.

Although the injury to the corn may be a clue to the culprit causing the injury, the best way to diagnose the problem accurately is to identify the insect. Following are descriptions of the insects in question. The best photos, as usual, come from Marlin Rice, extension entomologist at Iowa State University. His article "Insect Injury to Mid-Season Corn" in the June 28, 1999, issue of *Integrated Crop Management* has excellent photos of the different types of injury and some of the species of caterpillars. You can find it on the Web at http://www.ipm.iastate.edu/ipm/icm/1999/6-28-1999/midscorninj.html. If you want to try out a dichotomous key to caterpillars on the Web, check out a "Simple pictorial key for identifying some common late-instar caterpillars found on corn" at http://www.ent.iastate.edu/pest/cornborer/key/. This key, prepared by George Godfrey, an entomologist formerly with the Illinois Natural History Survey, is a great way to learn to identify caterpillars, with step-by-step comparisons that usually lead to a species. The key also has very good illustrations and photographs (Marlin Rice's).

Armyworm. A full-grown larva is about 1 1/2 inches long and green-brown, with varying degrees of black mottling and white flecks. Two orange stripes along each side and two dark stripes on the back are characteristic. The head is yellow-brown, with a brown, netlike pattern of dark lines.

Corn earworm. A full-grown larva is about 1 5/8 inches long, varying from yellow, brown, and red to green, with prominent bands of cream, pink, green, or yellow. The head usually is dark yellow or orange. The cuticle ("skin") is covered with microspines.

European corn borer. Small larvae (first and second instars), the ones usually found in whorls, have dark brown heads and somewhat translucent white bodies. A full-grown larva is 3/4 to 1 inch long, with a medium to dark brown head and a creamy white to gray body. Raised, sometimes slightly darkened, tubercles are evident on the body.

Fall armyworm. A full-grown larva is about 1 1/4 inches long and varies from light tan or green to black. The caterpillar is smooth skinned, with three yellow-white lines along the back and a wider dark stripe on each side of the yellow-white lines. Below the dark stripe on each side is a wide, wavy yellow stripe with red splotches. The head is dark brown with a white inverted *Y* on the front (although this may be lacking in some specimens). Fall armyworm larvae can be confused with corn earworm and armyworm larvae. However, a corn earworm larva has a yellow-brown head and rough skin, covered with microspines; armyworm larvae do not have the white inverted *Y* on the head. If you want to compare the heads of armyworms, corn earworms, and fall armyworms, go to the article "Corn Earworms in Whorl-Stage Corn" in the July 12, 1999, issue of *Integrated Crop Management* at http://www.ipm. iastate.edu/ipm/icm/1999/7-12-1999/cewinwhorl.html.

Kevin Black, an entomologist with Growmark, may have found fall armyworm larvae in whorl-stage corn in Macoupin County during the week of June 17. However, the identification

has not been verified. Interestingly, no one has reported captures of fall armyworm moths in pheromone traps, including Ron Hines, senior research specialist at the University of Illinois Dixon Springs Agricultural Center. (Check out his weekly moth-capture report at http://www.ipm.uiuc.edu/publications/hines-report/.) Nevertheless, because corn was planted late in many areas of Illinois this year, it's important to be watchful for fall armyworms. The damage often looks worse than it is, but an insecticide may be justified if 75% of the plants have whorl-feeding damage and larvae are still present.

Southwestern corn borer. A full-grown larva is 1 to 1 1/4 inches long, with a white body and brown to red-brown head (although young larvae have black heads). A pattern of large, raised, black tubercles on each body segment is evident.

Stalk borer. Larvae are 1/12 to 1 3/4 inches long, depending on instar, and purple to black, with five longitudinal white stripes (one on top, two on each side), broken by a purple band encircling the body just behind the head. Older larvae lose the distinct striping, but they usually are not found in corn whorls.

Happy caterpillar hunting. Please don't hesitate to keep us apprised of your findings in your neck of the woods.—*Kevin Steffey*

Stalk Borer Management: Role of Bt Corn

This year we received quite a few calls concerning stalk borer injury to corn. As producers know, managing stalk borers is a tricky business. In many instances, stalk borers are ignored until plants begin to show some of the classic signs of infestation, such as "dead-heart" injury. We also know that it is key to kill stalk borer larvae as they leave their weed hosts to prevent them from tunneling into nearby corn plants. We've stressed that good weed management practices often prevent economic infestations of stalk borers. Having laid out these stalk borer management basics, we also know that this insect species proves frustrating for many farmers each year. Thus, the question: Will Bt hybrids prevent stalk borer damage?

A paper published (June 2002) by two Iowa State entomologists (Rachel Binning and Marlin Rice) in the *Journal of Economic Entomology* (vol. 95, no. 3) took a very close look at this question. They evaluated the efficacy of two genetic events (event Bt 11-Cry1Ab and event CBH351-Cry9C). The scientists infested two transgenic hybrids and their "non-Bt near isogenic" lines with stalk borer larvae (first through fourth instars). Each hybrid was infested with a specific stage of instar at three growth stages (V1, V3, and V5). Results from the paper offer good insights regarding the potential usefulness of Bt hybrids for management of this frustrating insect pest of corn. The authors offered the following concluding remarks in the discussion section of their paper: "Although Bt corn does not eliminate stalk borers, farmers planting Bt corn to control the European corn borer may benefit from reduced stalk borer infestations, especially if the larvae are first or second instars and the corn plants are at stage V3 or older. The reduction in numbers of stalk borer would be more significant when combining Bt corn with other management techniques, such as mowing or burning grassy areas in the spring and encouraging the presence of natural enemies."

We will continue to learn more about the role of transgenic plants and other pest management tactics used in combination to manage a variety of insect pests of field crops.—*Mike Gray*

Scientists Report on the Efficacy of a Binary Insecticidal Crystal Bt Protein for Corn Rootworms

In the most recent issue (June 2002) of the *Journal of Economic Entomology* (vol. 95, no. 3), scientists with Dow AgroSciences, in Indianapolis, Indiana, reported on the insecticidal effects of binary crystal proteins in laboratory bioassays against southern corn rootworm larvae. Southern corn rootworm colonies are often used in laboratory bioassays and are thought to serve as good test organisms that can be used to predict potential insecticidal effects against more important pests; in this case, western corn rootworms. The binary insecticidal protein discussed in the paper was produced from a strain (PS149B1) of *Bacillus thuringiensis (Bt)* and consists of two Cry proteins (Cry34Ab1-14kDa and Cry35Ab1-44kDa). The investigators report in the paper that both of these proteins have been co-expressed in transgenic corn plants and "effectively control" western corn rootworm grubs in the field. The authors further report that the smaller Cry protein (14kDa) was active against southern corn rootworms by itself; however, its activity was "synergized" by the larger Cry protein (44kDa).

Additional tests on these Cry proteins and others will surely follow, and the results will be of great interest to the agricultural community for many years to come. There is considerable anticipation on the part of producers regarding the potential commercialization of transgenic hybrids for corn rootworm management. In addition, interest in the reliability of seed treatments for rootworm management continues. During the next 5 years, a transition most likely will occur as producers lean more toward seed treatment and transgenic technologies, as the "backbone" of their rootworm management programs. Obviously a lot has to occur before this transition begins to take shape. Most notably, the U.S. EPA will need to approve the use of transgenic hybrids for corn rootworm control. In addition, to date, seed treatments have not shown that they provide consistent root protection against heavy corn rootworm infestations. I think systemic seed treatments have great potential; however, we still have much to learn.—*Mike Gray*

Japanese Beetles Have Begun to Emerge in Southern Indiana

Entomologists at Purdue University reported the first sighting of Japanese beetle adults on June 12 in the Evansville area (near White County in Illinois). Take note of this occurrence because, based on reports of grub injury this year, we could witness some large numbers of this pest this year. During the next couple of weeks, all of us should be on the lookout for this visually striking pest. The Japanese beetle adult is about 1/2 inch long and 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 hairs.

When Japanese beetles emerge, they will seek host plants on which to feed, and we all know that these insects feed on many types of hosts, including corn and soybeans, as well as flowers, ornamental plants, and fruits. Japanese beetles feeding on silks in cornfields and defoliating soybeans can result in economic damage. We will want to watch for the beetles moving into the edges of corn and soybean fields and be prepared to assess their population levels and the amount of injury they cause. We'll provide more information and management recommendations in a future issue of the *Bulletin*.—*Kevin Steffey*

The Search for Soybean Aphids in Soybean Fields Begins

We haven't said much about soybean aphids this spring because there hasn't been much to report. However, with the first findings of soybean aphids in soybean fields in Illinois, Iowa, Michigan, Minnesota, and Wisconsin, it's time to start watching more closely.

The first two reports of soybean aphids in soybean fields this year came from Michigan and Wisconsin. In the June 13, 2002, issue of Michigan State University's *Field Crop Advisory Team Alert,* entomologist Chris DiFonzo reported finding soybean aphids in soybean during the week of June 10. The aphids were found in East Lansing and in Saginaw County at the Beet and Bean research farm. Following is a quote from her article: "Judging by the largest aphids found, colonization began about June 5–6." In the June 13, 2002, issue of *Wisconsin Crop Manager,* entomologist John Wedberg reported that David Hogg's crew also found soybean aphids in soybean during the week of June 10, close to their first detection in 2001 (June 15). Following is a quote from John's article: "Two years' experience has failed to show threatening levels of aphids in V0–V1 soybean, but it's still worth spot checking these seedling beans."

The Minnesota Department of Agriculture reported finding soybean aphids in a soybean field in Houston County (extreme southeastern Minnesota) on June 12. Approximately 50% of the plants were infested with one to two aphids each. This field was the only field among 195 fields sampled in which aphids were found.

More recently, someone in Iowa reported finding soybean aphids in a soybean field in Winneshiek County. This report has been registered at the Web site "2002 Soybean Aphid Watch": http://www.pmcenters.org/Northcentral/Saphid/. This Web site has expanded from last year to include all of eastern North America. The big map on the front page of the Web site shows all of the counties in eastern North America. Counties in which soybean aphids in soybean fields have been reported are red. Navigate to the area of interest by clicking an individual state or province. To view all of the reports submitted from a county or division, click on the appropriate administrative unit on the map. There are links to other sites, too. You can access the 2001 data, information on soybean aphids, and diseases that they transmit using the navigation menu.

Most important for producers in Illinois, soybean aphids were found for the first time in Illinois this year on June 19 in Kendall County. Ron Estes, research specialist in agriculture in the Department of Natural Resources and Environmental Sciences, sampled 30 V1–V2 stage plants in the field and found aphids on two of the plants—only 1 aphid on one plant and a small colony of about 12 aphids on the other plant. Aphids have begun their annual movement from their primary host (buckthorn, *Rhamnus* spp.) to soybeans throughout the upper Midwest, so it's time to start watching them closely. At least a couple of teams of folks from the University of Illinois will be searching in northern counties during the next couple of weeks, and we will report our findings in future issues of the *Bulletin*. Don't hesitate to contact us if you think they have found them.

As we have stated previously, we really don't know whether soybean aphids will reach economic levels in 2002. However, the lateness of planting of soybeans this year might have an impact on soybean aphids this year; later-planted soybeans are more likely to suffer economic damage caused by soybean aphids.

We have developed a fact sheet that includes updated information about soybean aphids in Illinois. You can view it on the Web at http://www.ipm.uiuc.edu/agriculture/soybeans/nsrl_4.pdf. If you want a paper copy of the fact sheet, please contact your local Extension office or contact Extension Entomology, Department of Crop Sciences, University of Illinois, S-318 Turner Hall, 1102 South Goodwin Avenue, Urbana, IL 61801; telephone (217)333-6652.

We'll do our best to keep you informed about soybean aphids throughout Illinois and elsewhere this year.—*Kevin Steffey*

Don't Forget About Potato Leafhoppers

Although we haven't said much about potato leafhoppers this year, people who are scouting in alfalfa fields need

to focus on this very important pest in June and July. Although the previous cool, wet weather probably kept leafhopper numbers from increasing, the more recent warm weather will accelerate their development. Some people have begun to report larger numbers during this past week. Following is information that should help you scout for and potentially manage potato leafhoppers in alfalfa.

Description. Adult potato leafhoppers are lime green, wedge-shaped insects approximately 1/8 of an inch in length. Adults have fully developed wings and are very active fliers. The nymphs, smaller versions of the adults, are yellow-green and lack wings. When disturbed, the nymphs move sideways or backwards ("crablike" movements).

Life history. Potato leafhoppers do not overwinter in Illinois. Instead, they migrate northward from southern states assisted by wind currents. Soon after their arrival in the Midwest, the females begin to lay eggs in stems and larger leaf veins. The eggs hatch in 6 to 9 days into nymphs. Multiple generations are accomplished throughout the summer with leafhoppers persisting until cooler fall temperatures return.

Injury. Potato leafhoppers suck fluids from alfalfa plants with their piercing-sucking mouthparts. They inject saliva that contains a compound toxic to plants. In addition, their feeding clogs the conductive tissue of plants, resulting in an accumulation of starches. This accumulation causes a relative nitrogen deficiency, resulting in yellowing or injured leaves. Most people notice the first symptom of potato leafhopper injury as a V-shaped yellowing at the tips of the leaflets, commonly referred to as "hopperburn" or "tipburn." As injury progresses, the leaves may turn purple or brown and then die. Severely injured plants also are stunted and bushy in appearance because the internodes stop growing normally.

Scouting and thresholds. A 15-inch diameter sweep net is the required sampling tool for potato leafhoppers in alfalfa. Static treatment thresholds are based on the number of leafhoppers per sweep of the net. The threshold increases as alfalfa grows and becomes more tolerant to leafhopper feeding: 0.2 per sweep on stubble (up to 3 inches), 0.5 per sweep on 3- to 6-inch alfalfa, 1.0 per sweep on 6- to 12-inch alfalfa, and 2.0 or more per sweep on plants 12 inches or taller. The sweep net should be swung like a broom through the top 4 to 6 inches of growth. Each thrust with the net is a sweep. Take 20 sweeps per location in 5 to 10 sites within the field if the alfalfa is taller than 4 inches. If the alfalfa is shorter than 4 inches, more sweeps are required for a precise sample estimate. Count the number of leafhoppers caught in the net and divide by the number of sweeps taken. If the number exceeds suggested treatment thresholds, an insecticide application may be warranted.

Entomologists with Iowa State University suggest that economic thresholds need not depend on plant height. Table 1 provides some economic thresholds for your consideration, based on crop value, control costs, and leafhopper densities. In general, these thresholds are less conservative than those (based on plant height) mentioned previously for shorter plants and more conservative for taller (12 inches or more) stands.

Table 1. Economic thresholds for potato leafhoppers (numbers per sweep) at different crop values and control costs (from Iowa State University).

Crop value ($ per ton)	*Insecticide cost $6 per acre*	*Insecticide cost $8 per acre*	*Insecticide cost $10 per acre*
$50	1.3	1.5	1.8
$75	1.2	1.1	1.3
$100	0.8	0.9	1.1
$125	0.7	0.8	0.9

Insecticides. Insecticides suggested for control of potato leafhoppers in alfalfa include the following: *Ambush (3.2 to 12.8 ounces per acre), *Baythroid 2 (0.8 to 1.6 ounces per acre), dimethoate (see product label), Imidan 70W (1 to 1 1/3 pounds per acre), *Lorsban 4E (1/2 to 1 pint per acre), *Mustang (2.4 to 4.3 ounces per acre), *Pounce 3.2EC (4 to 8 ounces per acre), Sevin XLR Plus (1 quart per acre), and *Warrior (1.92 to 3.2 ounces per acre). Use of products preceded by an asterisk is restricted to certified applicators. Please follow all label directions and precautions.—*Kevin Steffey and Mike Gray*

National Pest Alert: West Nile Virus

Many of you undoubtedly have heard or read reports about West Nile encephalitis, a mosquito-transmitted disease first reported in North America in 1999. If you want to read the most current and scientifically accurate information, visit the North Central Pest Management Web site at http://www.ncpmc.org/NewsAlerts/westnilevirus.html. You will find a fact sheet and some links to information. Instead of relying on newspaper and television reports, get the straight poop from this Web site.—*Kevin Steffey*

PLANT DISEASES

Odd Plant Diseases Due to Odd Season

Head Scab of Winter Wheat

"Crazy Top, Common Smut, and Head Scab" would be a great name for a new-wave band. Head scab of winter wheat is being seen already, and the others should be fairly common this season, given our wet and stormy spring.

I wrote about head scab of wheat earlier in the season (issue no. 9, May 24, 2002), and now it is evident in the field. Matt Montgomery, Extension

crop systems educator, notes scab showing up in many fields in Sangamon and Menard counties.

Scab is seen easily in the field because of its characteristic bleached or partially bleached heads. Examine the affected heads, carefully peel back bleached glumes, and you will likely see the diagnostic salmon-to-pinkish-colored fungus growing right beneath it. Abundant scab may lead to significant quality reduction, as well as direct yield loss. Blower speed on the combine should be turned up high to blow as much of the scabby wheat out of the back of the combine. Yes, this provides a source of the fungus in the field, but the less scabby wheat you bring in, the better the price.

Odd-Looking Field Corn Diseases

Why will we see crazy top and common smut of field corn this year?

Let's start with crazy top. Crazy top is caused by the fungus *Sclerophthora macrospora,* a soilborne fungus. The fungus is ubiquitous in our soils but only incites infection under very favorable conditions for the fungus. Under highly saturated or flooded conditions, the fungus produces motile spores. Typically, the soil must be saturated for 24 to 48 hours for the fungus to develop. Spores are either splashed up into the whorl or, in a flood situation, washed right into the whorl. The spores then infect the growing point of seedling corn, and the fungus grows systemically within the plant. When the plant should be tasseling, instead a great proliferation of short, stunted leaves is produced in response to the fungal infection.

This looks like a tight bouquet of leaves, which makes it easy to see why this disease was named crazy top. Other than avoiding flooded conditions, no control measures are known for crazy top. It is usually very limited in its appearance and doesn't cause substantial yield loss as a whole.

Common Smut

The second part of the question deals with common smut. Common smut is also a soilborne fungus. Caused by the fungus *Ustilago maydis,* it is a very recognizable disease. This fungus, like the crazy top fungus, also infects the growing point, as well as other embryonic tissue, of the corn plant. It's a fairly lazy fungus, in that it typically needs some type of wound in the seedling corn to successfully infect the plant. The wounding usually takes place in the form of tissue damage to the seedling corn leaves from blowing, infested soil during heavy storms. The fungus is ubiquitous in our soils and corn is susceptible (sweet corn even more), so the right environmental conditions are all that is needed for infection. I have observed through the years that corn that received a shot of growth-regulator herbicide, such as 2,4-D, late in the season is likely to be affected by smut. Interestingly, variation exists in different varieties' responses to growth-regulator damage and subsequent smut infection.

When an ear should be emerging on the corn plant, instead, a proliferation of galls (smut balls) are produced that later form the familiar black, powdery spore masses as they mature.

Common smut can also be found on leaves or tassels, but usually the ear is most affected. Yield loss is direct.

So, why will we see more than the usual amount of crazy top and common smut this year? Because we have had highly saturated soils from numerous storms and local flooding; the fungi are throughout most of our soils; and, of course, we have a susceptible crop. That's all the disease needs to develop, besides a bit of time.—*Suzanne Bissonnette*

Basic Information About Soybean Rust

Recently, concerns have been expressed and questions asked about soybean rust. The first important point to know is that soybean rust has *not* been found in the United States, except in Hawaii.

This disease is nowhere near the midwestern corn/soybean belt, and we don't know if it will come or how much damage it potentially could cause here. For obvious reasons, research is not allowed on this disease in the Midwest, and we don't know much about how or if it is capable of surviving or spreading in the Midwest.

The purpose of this article is to provide some basic information about soybean rust and to answer the question "What is soybean rust?"

Soybean rust is caused by two different rust fungi: *Phakopsora meibomiae* and *Phakopsora pachyrhizi*. *P. pachyrhizi* is the more aggressive of the two species and has been reported in Hawaii. The fungi that cause soybean rust are unrelated to the fungi that cause rust on corn. Different races of these pathogens are known to occur. Lesions most often develop on the bottom of leaves, in middle or late summer. The lesions are pinhead sized (1/12 to 1/6 inch in diameter) and tan to gray to brown in color, and have sharp edges that are bordered by leaf veins. Several small pustules (tiny bumps) may be observed in the lesions, whereas only one pustule develops in lesions from bacterial pustule.

What conditions favor development of soybean rust? According to the basic principles of plant pathology, three things are required for plant diseases to occur: a susceptible host, presence of the pathogen, and appropriate environmental conditions. It is assumed that most or all commercial soybean cultivars are susceptible to rust, although the cultivars grown in the Midwest have not been tested for rust resistance. The hope is that resistant soybean varieties either exist or can be developed. As noted, the soybean rust pathogen does not occur in the Midwest, and we hope it doesn't arrive. It is not seedborne, and the microscopic soybean rust spores would most likely be spread by wind and rain or con-

taminated objects. Where the pathogen is present, development of the disease is favored by extended periods of leaf wetness and temperatures roughly between 50ºF and 80ºF.

Where is this disease now and how much damage has it caused? Soybean rust has occurred in a number of different areas for a number of years, including Australia, Brazil, China, India, Japan, central and southern Africa, and Thailand. Yield losses of 10% to 90% have been reported for some of these areas. Its presence was reported in Hawaii in 1994. Soybean rust (the more aggressive type) was reported in South America for the first time in 2001, and again in 2002. Yield loss estimates for Paraguay and Brazil range from 10% to 50% for 2002, respectively, in some fields. This disease also has the potential to cause significant losses in the United States.

How can soybean rust be managed? Fungicides are a main method for control of soybean rust. In addition, work is being done to develop soybean varieties with resistance to rust. Dr. Glen Hartman, a research plant pathologist with the USDA/ARS in Urbana, Illinois, and collaborators are working with soybean rust in confinement facilities in Maryland. Additional research has been done in Thailand, China, and Zimbabwe. Soybean rust may not come to the Midwest and may or may not be a problem even if it is introduced here. We hope never to find out, but management strategies are available (albeit, they may be costly in terms of additional expenses of multiple fungicide applications) to reduce the impact of rust on yields.—*Dean Malvick*

CROP DEVELOPMENT

Corn and Soybean After a Tough Planting Season

Corn and soybean planting is finally coming to an end for 2002, except of course for double-cropped soybean. And, in areas where excessive rainfall during the past two weeks has resulted in drowned crops in lower parts of fields or in bottomland, some producers are still hoping to plant soybean. A few still may be hoping to plant corn, but yield prospects for corn now are low enough that another crop should be planted if that is feasible.

Double-cropped soybean producers are accustomed to planting this late, but those hoping to replant in the northern half of the state face unfamiliar challenges. For almost everyone, the maturity of the varieties for planting in late June should be the same as that of varieties planted in May. In the northern tier or two of counties, producers who like to use late-maturing varieties (early group 3) for planting full-season soybean might want to drop back to a shorter-season (mid- or late group 2) variety in order to reduce the chance of the crop's not maturing before frost. Those who normally plant early-season varieties might even consider moving to slightly later-maturing ones. Late-planted soybeans tend to stay short, and if earlier varieties are used, they stay very short, especially if there is dryness during vegetative development. Shorter-season varieties also tend to be less able to withstand short periods of dry weather than longer-season varieties.

Probably more important than changing variety for replanting this late is using narrower row spacing. Because of the reduced vegetative growth—plant height and leaf area—that we expect when planting is delayed, soybean planted late in wide rows often will not form a complete canopy, and yield will suffer as a result. Any soybean planting after June 15 should, therefore, be done at a row spacing of 20 inches or less. Late planting in narrow rows probably should be done at a seeding rate of at least 200,000, keeping in mind that warm, moist soil conditions usually result in good emergence. On the other side of the coin, seed that has not been stored in very good conditions might be losing germinability by now. Last year was a good year for production and seed quality, so this should not be a problem unless seed was stored unprotected. But germination has been known to start dropping by the end of June, so some care is warranted to make sure replanted seed is good.

Most of the corn is growing well now, due to favorable temperatures and good soil moisture. Corn planted in early April at Urbana is now about waist high, with 11 or 12 leaf collars visible, while that planted in late April has reached the 9- to 10-collar stage. Even corn planted late will start its period of rapid upright growth soon, and its appearance will improve rapidly after that. Some of the "improvement" will come from the larger plants' making it difficult to see the problems that exist in some fields, however. We have had reports of poor stands due to the May frost, from hail, and from crusting and poor emergence, as well as from standing (and "restanding") water. Stands in 2002 will not be as good as those in 2001, but they're probably at least "average" in most fields.

If normal temperatures prevail, we're looking at tassel emergence being a week or so later than it was last year in the fields that were planted on time. Growing degree-days lost due to delayed planting or just cool temperatures are starting to accumulate now, but we can't expect corn planted in late May or early June to pollinate before mid-July. The key to successful pollination will be, as always, the weather. We need moderately warm temperatures and some early July rainfall to prevent yield-reducing stress in the crop. In general, the corn crop this year will have a smaller, shallower root system than we would like, meaning that it will be more affected by any stressful weather conditions. If we ever needed the "gentle inch of rainfall per week," it's this year. On the positive side, stored soil water is plentiful at this point, so our deep Illinois soils will help provide the water that the crop needs. Let's hope for the best.

Wheat harvest is just beginning in southern Illinois. The crop there headed at the normal time, and the fact

that it was filling grain up to the time it reached maturity recently is a good sign for yield, though there may be grain quality questions in many areas. I did have one report of "decent" yields, but where water stood in fields we probably can't expect miracles. For those who will be double-cropping, soil moisture supplies should be adequate for soybean establishment, at least in most areas.—*Emerson Nafziger*

REGIONAL REPORTS

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

- North (Northwest and Northeast districts, plus Stark and Marshall counties)
- West central (West and West 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.

Northern Illinois

The past week's major activities include applying postemergence herbicides, cultivating corn, sidedressing corn with nitrogen, and continued replanting of soybeans and some corn.

Producers have expressed concern about potential nitrogen loss and water damage to standing corn because of heavy rainfall received 2 weeks ago.

No insect damage reports have been received. However, potato leafhoppers have been observed in alfalfa regrowth.

Southern Illinois

After weeks of rain, we are now high and dry and actually wishing for a little sprinkle here and there. Wheat harvest is well under way. Yields have been reduced by barley yellow dwarf and scab. Most first-crop beans are in, with double-cropped beans to follow quickly. Corn planted is proceeding well, with sporadic reports of cutworm, southern corn leaf beetle, and grape colaspis.

West-Central Illinois

Storms marched across the region again last Wednesday evening, dropping as much as 4 inches of rain in some places. Scattered areas received hail that obliterated early-planted corn. Scattered showers fell again on Saturday evening, but accumulation was minor. Temporary flooding in bottomland and flat upland areas has had a noticeable effect on soybean emergence and stand establishment, but crops in better-drained areas appear to be in good condition.

Early-planted corn has progressed well and is anywhere from the V7 to V10 growth stage, and most sidedressing of nitrogen has been completed. The first flight of European corn borer moths is winding down, and larval feeding has been noted in many fields. Soybean growth stages range anywhere from unifoliate to fourth trifoliate, with most fields in the first or second trifoliate.

Wheat is in the dough stage and has begun to turn in many areas, but fungal diseases such as scab and head smut are apparent in some fields and will likely affect yields.

The agriculture department at Western Illinois University will hold its annual Herbicide Field Plot Tour at 1:00 p.m., Thursday, June 27, at the WIU Agronomy Field Laboratory, located immediately north of the WIU Harry Mussatto Golf Course off of Tower Road north of Macomb, Illinois. The field plot tour is open free to the public, free of charge. For more information, contact Dr. Gordon Roskamp at (309)298-1569.

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