

PEST MANAGEMENT & CROP DEVELOPMENT

BULLETIN

FOR IMMEDIATE RELEASE
No. 6 / May 2, 2003

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Available on the Web at
<http://www.ag.uiuc.edu/cespubs/pest/>
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INSECTS

Be on the Lookout for Black Cutworm Larvae

Western and southern parts of Illinois continue to be the hot spots for black cutworm moths thus far. Intense captures continue to be reported from Adams, Des Moines (IA), Gallatin, Hancock, Massac, Menard, Pope, and Pulaski counties. Sam Markert, Camp Point, reported his fourth intense capture of the spring on April 28. Chuck Albright, instructor at Southeastern Community College in West Burlington, Iowa, reported 45 moths caught in one night on April 24. Projections for cutting dates are based on the dates of intense captures and can be found in Table 1. Few moths have been reported from counties in central and northern Illinois.

Remember that projected cutting dates are only suggestions when cutworm injury may begin to occur. As corn begins to emerge, it is important to scout fields for cutworm damage every couple of days. Please look back to the previous issue of the *Bulletin* (issue no. 5) for detailed scouting procedures and how to use the head-capsule gauge to determine remaining days of feeding.

Rescue treatments are recommended when 3% or more of the plants are cut and larvae are present. Insecticides labeled as rescue treatments are summarized from the *Illinois Agricultural Pest Management Handbook* and listed in Table 2. Please note that the recommendations for Mustang Max are different from the rates previously listed for Mustang in the handbook.

Table 1. Projected cutting dates for black cutworm larvae (courtesy of Bob Scott, Illinois State Water Survey).

<i>Date of intense capture</i>	<i>Location</i>	<i>Projected cutting date</i>
April 7	Pulaski	May 4
April 7	Gallatin	May 4
April 12	Adams	May 8
April 15	Hancock	May 17
April 16-17	Sangamon/Menard	May 15
April 17-21	McDonough	May 18
April 19-20	Mason	May 19
April 24	Massac, Pope, Pulaski	May 16
April 24	Des Moines (IA)	May 20

Table 2. Insecticides labeled for use as rescue treatments for black cutworms, summarized from the 2003 Illinois Agricultural Pest Management Handbook.

Ambush	6.4 to 12.8 oz
Asana XL	5.8 to 9.6 oz
Capture 2EC	2.1 to 6.4 oz
Lorsban 4E	1 to 2 pt
Mustang Max	1.28 to 2.8 oz
Pounce 3.2 EC	4 to 8 oz
Warrior	1.92 to 3.2 oz

Continue to monitor for black cutworm moths, and be on the lookout for larvae as corn begins to emerge across the state.—*Kelly Cook*

More Corn Flea Beetles

Just a quick note: Reports of corn flea beetle activity continue to filter in. An overview of the corn flea beetle and its potential injury was given in previous issues of the *Bulletin* (issue no. 1, March 20, 2003, and issue no. 5, April 24, 2003). Heavy populations of flea beetles have been found feeding on seedling corn. The corn flea beetle vectors the bacterium that causes Stewart's wilt, to which most commercial field corn is resistant. Systemic seed treatments are also being used as feeding deterrents. One observer has noted a difference in flea beetle activity in a comparison of treated plants and an untreated check. Continue scouting fields, and keep your eyes open for these tiny black beetles and their feeding on seedling corn.—*Kelly Cook*

Bean Leaf Beetles Are Numerous

Although very few soybean fields have been planted thus far, growers who have planted or soon will plant soybeans should be aware that bean leaf beetles will pose an early threat. Early-planted soybeans are very attractive to bean leaf beetles that already have emerged from their winter dormancy. Based on some of the observational reports we have received this spring, bean leaf beetles are abundant in some areas of Illinois. Bean leaf beetles must have been sheltered from the cold temperatures this past winter by snow or other types of cover.

In issue no. 2 (April 4, 2003) of the *Bulletin*, I mentioned that Scott Isard, University of Illinois Department of Geography, had found fairly significant numbers of overwintering bean leaf beetles in a wooded area in

Champaign County. Scott uses pieces of cloth as overwintering traps. Joe Spencer, entomologist with the Illinois Natural History Survey, has visited some of these overwintering sites with Scott and shared this report: "Scott Isard and I made a stop last evening [April 15] at his favorite woodland piles of discarded clothing (north of Urbana). As he has noted before, we found hundreds of bean leaf beetles among the castoffs. Yesterday's big winner was a pair of brown and yellow plaid, flared-legged, denim trousers (circa 1971) that yielded 30 or more beetles. Our local BLBs seem to have gone retro! I hesitate to think how many BLB we might catch if we were to scatter some Supertramp albums and a leisure suit at this site!" Interesting thoughts for future sampling protocols.

With another somewhat unconventional sampling approach, Mike Hellmer, field sales agronomist with Pioneer Hi-Bred International in east-central Illinois, observed large numbers of bean leaf beetles on April 29. Mike reported that large numbers of insects were hitting the windshield of his pickup truck. When he stopped to investigate, he found hundreds of bean leaf beetles on the grill of his truck. He indicated that other sales representatives with Pioneer also have observed large numbers of bean leaf beetles either flying around or moving about in fields of soybean stubble.

I can add to these reports by conveying that we, too, observed many bean leaf beetles in a field in Piatt County on April 28. During field preparations for a Japanese beetle grub trial, we encountered quite a few bean leaf beetles moving about in the soybean stubble.

So the stage is set for bean leaf beetles to cause more concern in 2003. Although bean leaf beetles have been the most consistent pests of soybeans in Illinois for decades, their larger numbers in recent years and the possibility of their transmitting bean pod mottle virus have elevated the level of con-

cern among growers. Let's review what we know about this insect's life cycle, ability to cause injury to soybeans, and the potential for bean leaf beetles to transmit bean pod mottle virus.

Life cycle (in a nutshell). Bean leaf beetles overwinter as adults under litter in wooded areas and in crop fields. They become active early in the spring and move into nearby fields of alfalfa or clover, although they do not lay eggs in these fields. The beetles we observe in the spring are the same beetles we observed last fall (i.e., second-generation beetles from the previous year). As soon as soybean seedlings emerge, bean leaf beetles abandon forage fields and colonize soybean fields. They feed on the emerging seedlings, primarily on newly emerged leaves. After they finish feeding, the females lay eggs in the soil. Bean leaf beetle larvae feed on underground portions of soybean plants, including the nodules, although the larvae never have been associated with economic damage. The adults from the first generation of bean leaf beetles emerge in July and feed on the leaves. Females lay eggs for a second generation, and adults of the second generation feed on both leaves and soybean pods late in the summer. These beetles seek shelter for overwintering.

Injury caused by bean leaf beetles. Bean leaf beetle adults chew small, round holes in soybean leaves. Excessive feeding in the spring can cause plant death and stand loss. However, because soybeans can compensate for stand loss early in the season, control of bean leaf beetles in seedling soybeans usually is not necessary. Insecticides are warranted only when densities of bean leaf beetles reach 16 per foot of row in the early seedling stage or 39 per foot of row at stage V2+. These thresholds are based solely on the potential damage resulting from defoliation and have no bearing on the situation with bean pod mottle virus.

Bean leaf beetles and bean pod mottle virus. Based on what I have learned from the entomologists and plant pathologists at Iowa State University, the situation with bean leaf beetles and bean pod mottle virus is real in areas of Iowa, although still not thoroughly understood. As both Dean Malvick, Extension plant pathologist in the Department of Crop Sciences, and I have indicated in past issues of the *Bulletin*, the situation in Illinois is uncertain. We know that bean leaf beetles transmit the virus in Illinois, but we do not know the extent of the resulting infection in field situations, and we don't know the extent of the problem, if there is a problem.

Rather than paraphrase what the entomologists at Iowa State University are telling their growers about bean leaf beetles and bean pod mottle virus, I direct you to three articles published recently in their *Integrated Crop Management* newsletter—<http://www.ipm.iastate.edu/ipm/icm/>. The articles titled “Recent bean leaf beetle and bean pod mottle virus research,” “Bean leaf beetles and soybean planting date,” and “Management decisions for bean leaf beetles and bean pod mottle virus” summarize what the folks at Iowa State University know at the present time. Although we can't say for certain that their management recommendations are relevant in Illinois, soybean growers certainly are interested in learning more. We intend to embark on some of our own research to further investigate this issue in Illinois. In the meantime, we'll continue to relay important developments in both research (in Illinois or elsewhere) and field observations. As always, stay tuned.—*Kevin Steffey*

Aphids in Wheat

We have received a handful of reports of aphids in wheat fields in southern and south-central Illinois, and the numbers of aphids seem to be increasing in some fields. It's not uncommon to find aphids in wheat at this time of year, and it always causes some alarm. Although aphids usually do not cause

any appreciable yield losses in wheat, some comments about this are in order.

The bird cherry-oat aphid usually is the first species of aphids found in wheat. It is olive green with a red-orange band across the rear of the abdomen; the tips of its cornicles (“tail pipes” that protrude from the rear of the abdomen) are black. Other species of aphids in wheat are English grain aphids, which are green and have long, narrow cornicles that are entirely black, and the greenbug, the most threatening aphid species. The greenbug is bright green, with a darker stripe along the middle of its back. The tips of the cornicles are black.

Matt Montgomery, Extension crop systems educator in Springfield, found a few bird cherry-oat aphids in a wheat field in his area on April 22, although the numbers he observed were relatively small (12 in about 30 sweeps). People in southern Illinois have found larger numbers of these aphids in wheat fields.

Entomologists have never been able to associate economic yield losses in wheat with infestations of bird cherry-oat aphids (caused solely by their feeding); however, both English grain aphids and greenbugs are capable of causing yield losses under the right circumstances. Cool temperatures sometimes hold back the parasitoids that usually suppress early-season populations of aphids in wheat. If aphids begin building their colonies in the absence of natural enemies, their numbers could escalate rapidly.

Economically important outbreaks of aphids are uncommon in wheat in Illinois, but noting their presence and potential buildup is important. Seedling wheat can be severely injured by the feeding of aphids, but wheat in the boot or heading stage is seldom damaged economically by these insects. Greenbugs generally cause greater damage to wheat than the other aphids because they inject toxic enzymes into plants during feeding. Research regarding the effect of aphids on wheat

yields suggests that the threshold is 12 to 15 aphids per tiller during seedling to boot stage. However, the presence of natural enemies often keeps aphid populations in wheat below economically damaging densities. In addition to lady beetles, a fungus disease and parasitoids also suppress aphid populations. In cool, wet springs, a fungus disease helps to keep aphid populations in check. The presence of aphid “mummies”—swollen, copper- or tan-colored aphids—reveals the activity of parasitic wasps.

Aphids also can transmit barley yellow dwarf virus. Entomologists at the University of Kentucky indicate that the bird cherry-oat aphid is the most important vector of this virus. However, management of aphids to prevent them from spreading the virus should be initiated in the fall rather than in the spring. In fact, one of the best ways to reduce the incidence of barley yellow dwarf in wheat in the fall is to plant after the Hessian fly-free date. Many wheat growers have ignored this age-old cultural tactic, even though the benefits for pest management are significant. Insecticide application after the appearance of symptoms of barley yellow dwarf virus provides little value.

One final note. It's important to diagnose the problem in wheat before making a decision to control aphids. Ron Hines, senior research specialist at the University of Illinois Dixon Springs Agricultural Center, observed some diseaselike symptoms in wheat at the center and also found a few aphids. However, Ron indicated that the symptoms of injury in the wheat probably were weather and fertility related rather than a virus transmitted by the aphids. So don't get out the insecticide to control aphids if aphids are not responsible for the problem.—*Kevin Steffey*

Alfalfa Weevil Update

Mixed reports continue to come in regarding alfalfa weevil activity. Reports are ranging from little or no

activity to heavy feeding. Kevin Black, Growmark, received a report from Jeremy Hamson, Agripride FS, that several fields in Washington County have visible alfalfa weevil injury and have exceeded economic thresholds. The trouble lies with timing insecticide applications with rainfall. Due to the preharvest intervals that accompany many of the labeled insecticides, growers are left with the options to wait on insecticide applications or delay harvest, which is expected in 1 to 2 weeks.

Figure 1 has the actual accumulated degree-days (base 48°F), from January 1 through April 29, 2003. Two distinct peaks of larval activity occur in southern Illinois, one from fall-deposited eggs and one from spring-deposited eggs. An early peak of third-stage larvae from overwintering eggs occurs after an accumulation of 325 degree-days, which has already occurred

throughout much of the state. Figure 2 shows the projected accumulation of degree-days (base 48°F), from January 1 through May 12, 2003. If temperatures between now and May 12 are equivalent to the 40-year averages, we should expect a second peak of third-stage larvae to have occurred throughout most of the southern half of the state (after an accumulation of approximately 575 degree-days).

Continue to scout for alfalfa weevil larvae to determine if economically damaging levels are present. Economic thresholds can be determined by the percentage of tip feeding or number of alfalfa weevils per stem. Table 3 shows some economic thresholds for alfalfa weevils based on percentage of tip feeding associated with accumulated degree-days. Table 4 shows some economic thresholds based on numbers of alfalfa weevil larvae per stem at different alfalfa

heights and values of alfalfa hay. These thresholds are published in *Pest Management of Alfalfa Insects in the Upper Midwest*, published in 1999 by the Leopold Center for Sustainable Agriculture, Iowa State University, Ames.

Suggested insecticides for alfalfa weevil control are summarized from the *Illinois Pest Management Handbook* and listed in Table 5. Once again, please note the recommendations for Mustang Max are different from those listed for Mustang in the handbook.

Keep us posted on any findings in the field.—*Kelly Cook*

Planting Season Is Topdressing Time

“April and May is planting season. Any big activities during those months will have to go on without me.” Most

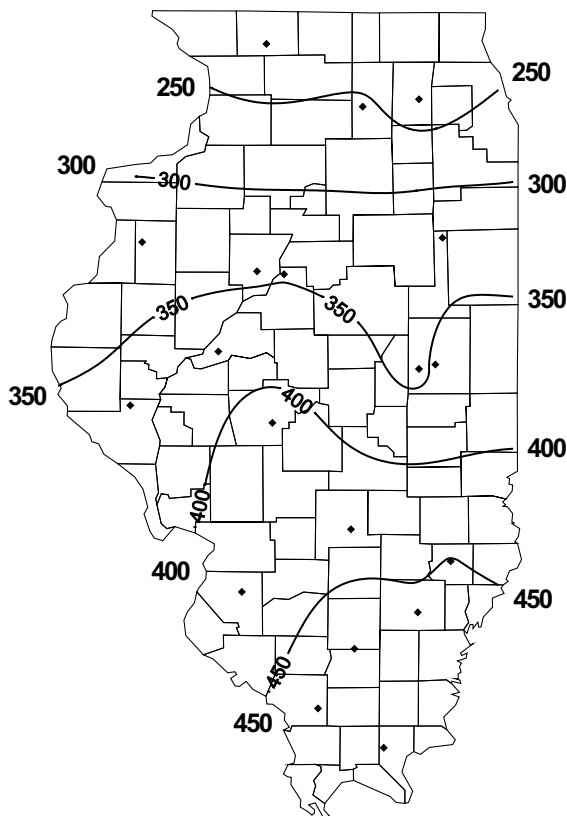


Figure 1. Actual degree-day accumulations (base 48°F), from January 1 through April 29, 2003. (Map courtesy of Bob Scott, Illinois State Water Survey.)

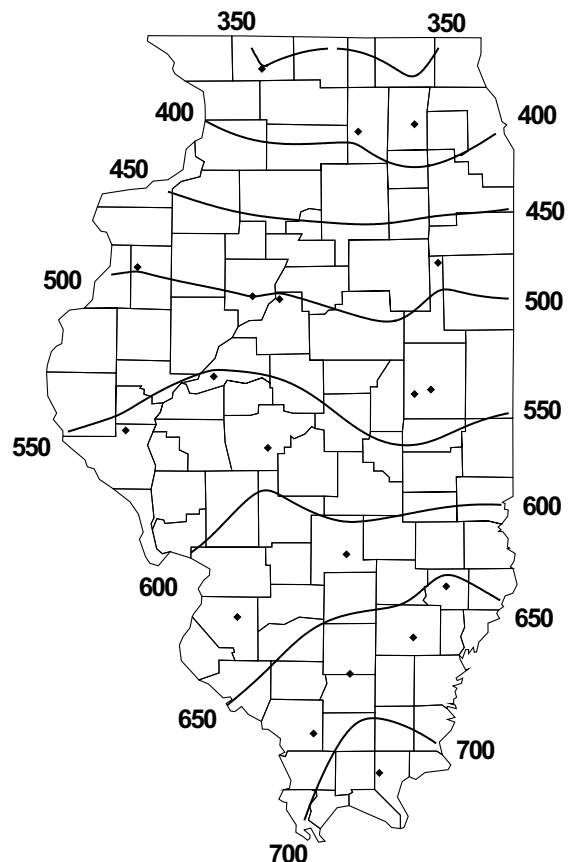


Figure 2. Projected degree-day accumulations (base 48°F), from January 1 through May 12, 2003. (Map courtesy of Bob Scott, Illinois State Water Survey.)

Table 3. Economic thresholds for alfalfa weevils (adapted from *Pest Management of Alfalfa Insects in the Upper Midwest, 1999, Leopold Center for Sustainable Agriculture, Iowa State University, Ames*).

<i>Accumulated degree-days after January 1^a</i>	<i>Percentage tip feeding damage threshold^b</i>	<i>Decision</i>
150–300	<25%	If less than threshold, reevaluate in 3–7 days.
300–400	25–50%	If damage threshold is reached, determine the number of larvae per stem and the plant height.
400–500	50–75%	If damage threshold is reached, determine the number of larvae per stem and the plant height.
500–600	75–100%	Refer to economic thresholds based on plant height.
600–harvest	75–100%	Refer to economic thresholds based on plant height.

^aDegree-day accumulation above 48°F from January 1.

^bPercentage of stems with feeding from 30–50 stem sample, when alfalfa weevil larvae are present.

Table 4. Economic thresholds based on numbers of alfalfa weevil larvae per stem (adapted from *Pest Management of Alfalfa Insects in the Upper Midwest, 1999, Leopold Center for Sustainable Agriculture, Iowa State University, Ames*.)

<i>Plant height</i>	<i>\$40 per ton</i>	<i>\$70 per ton</i>	<i>\$100 per ton</i>	<i>Management decision</i>
4 in.	1.8–2.8	0.8–1.3	0.6–0.8	Reevaluate in 4 days. If damage and larval numbers are increasing, a long-residual insecticide is recommended to prevent severe yield loss.
6 in.	2.0–3.0	0.8–1.5	0.6–1.0	
8 in.	2.2–3.2	0.9–1.7	0.7–1.2	
10 in.	2.3–3.5	0.9–1.9	0.8–1.4	If alfalfa is in vegetative stages, a short-residual insecticide should be used. If fields are harvested, closely evaluate stubble damage and larval densities.
12 in.	2.4–3.8	1.0–2.2	0.9–1.6	
14 in.	2.5–4.2	1.2–2.5	1.0–1.8	
16 in.	2.6–4.6	1.5–2.8	1.1–2.0	If more than 60% of alfalfa is in the bud stage, harvest is recommended. If not scheduled to be cut in 7–10 days, a short-residual insecticide is recommended.
18 in.	2.7–5.0	1.7–3.1	1.2–2.3	
20 in.	2.8–5.8	2.0–3.4	1.4–2.6	
>20 in.	3.0–7.0	2.4–4.0	1.6–3.0	

Use lower density (number of alfalfa weevil larvae per stem) if alfalfa is drought-stressed and/or if control costs are relatively low (\$7–10 per acre).

Use higher density (number of alfalfa weevil larvae per stem) if rainfall is abundant, diseased larvae are present, or control costs are relatively high (\$11–14 per acre).

Table 5. Insecticides recommended for control of alfalfa weevil, summarized from the *2003 Illinois Agricultural Pest Management Handbook*.

<i>Insecticide</i>	<i>Rate</i>	<i>Preharvest interval</i>
Ambush	12.8 oz	14 days
Baythroid 2	1.6 to 2.8 oz	7 days
Furadan 4F	1/2 to 2 pt	7–28 days
Imidan 70W	1 to 1 1/3 lb	7 days
Lorsban 4e	1 to 2 pt	14 days
Mustang Max	2.24 to 4.0 oz	3 days
Pounce 3.2EC	8 oz	14 days
Warrior	2.56 to 3.84 oz	7 days

people involved in agriculture probably have expressed similar sentiments to those demanding “other things” in April and May. Although planting season is a very busy time of year, it also is a very critical period for people who want to manage stored grain insects in corn that will be stored into the early summer. Taking a break from planting season to manage stored grain insects now can mean a lot of savings later.

Corn typically is safe from insect infestations if it is not stored past May or June following harvest. However, if corn is stored beyond June, you can count on infestations of stored grain insects. The management techniques required depend largely on how “summer bound” stored corn will be.

Corn to be stored for a long period of time after May or June requires early

management and forethought because infestations likely will be evident deep in the grain mass by delivery time if the grain is not treated. After the corn becomes severely infested, it should be cleaned and sold as soon as possible. Cleaning may entail mild activity—pulling out a core of infested grain and delivering the salvaged portion—or fairly extreme activity—hiring a professional to fumigate the bin. Therefore, corn that will be stored for a long term should be placed in the bin only after old corn has been removed and the bin has been cleaned. Treating the bin with an insecticide may be needed to eliminate problems in hard-to-reach places. New corn that will be stored for a long time should be treated as it is augered into the bin. If these steps were not taken last fall for corn intended for long-term storage past May or June this year, you might want to reconsider the amount of time you store corn.

Corn to be stored for a short time after May or June likely needs only a topdressing of insecticide if sanitation and rotation were practiced. Materials such as Bt, pirimiphos-methyl (Actellic), or diatomaceous earth can be raked into the top 4 to 6 inches of the grain. Application time for those materials is April or May. These products are effective only against insects feeding at the grain surface (e.g., Indian mealmoth [the only stored soybean pest] and Angoumois [grain moth]). Those insects that feed beneath the surface will not be eliminated by topdressing. Taking the time to treat stored grain now is very important because a detection of surface feeders too late may require removal of webbed grain, followed by a topdress treatment or fumigation. Infested corn less than a year old often can be fed to livestock.

Applicators should always read and follow label directions, especially noting feed and delivery restrictions.—*Matt Montgomery*

PLANT DISEASES

Corn Seed and Seedling Diseases and Fungicide Seed Treatments

This article will provide a brief review of corn seed and seedling diseases and the fungicidal seed treatments (including one new product) that are used to manage these diseases.

Corn planting is off to a good start in Illinois, with about 47% in the ground on April 27 versus 24% last year on this date (estimates from the National Agricultural Statistics Service, USDA). Much of the state has good conditions for corn germination and seedling growth, while some areas have wet conditions. Where conditions are relatively warm and dry, seed and seedling diseases will have minimal impact, and seed/plant loss may not exceed the 5 to 10% loss that we may normally expect at this stage of crop development. However, conditions can

become favorable for disease if they turn to prolonged cool and/or wet conditions, as we saw in May 2002.

How can seed and seedling diseases affect the corn crop? We can probably generalize and say that seed and seedling diseases may have a minor impact on corn in many fields during an average year in Illinois. Partly, this is due to widespread use of corn fungicidal seed treatments along with average conditions that don't favor seed and seedling diseases. But when soil is cool and wet after planting and emergence and growth is "delayed," these diseases can be a problem. Their main effects may be reduced plant populations and stunting. In addition, it is possible that nonlethal infection at the seedling stage may cause damage through the growing season. Not as much data as is desirable exists to document potential damage from seed and seedling pathogens, but results from two seed treatment studies provide some indication of damage caused by soilborne corn fungal pathogens. Studies from Iowa (G. Munkvold, 1998) suggested Captan+ Allegiance and Maxim+ ApronXL can provide a yield increase of 10 to 15 bushels per acre compared to nontreated seed, and results from Illinois (W. Pedersen, 2000) were similar with these same products (10- to 15-bushel-per-acre increase over nontreated check).

How can you recognize a problem with corn diseases that affect seeds and seedlings? Disease damage may appear to be similar to some environmental stress, but general and specific symptoms can help you diagnose a disease problem. General effects of corn seed and seedling disease are reduced emergence, slow growth and stunting in a random or circular pattern, wilting, chlorosis/yellowing, and postemergence damping-off. Specific symptoms of seed and root infections include rotted seed and seedlings before or after emergence; red/yellow discoloration of leaves; complete or partially rotted roots with firm or soft brown reddish to gray lesions or de-

cay; discolored and soft coleoptile; death of leaf tips; wilting; and sunken, discolored lesions on mesocotyl. Leaf spots and streaks can also occur, resulting from anthracnose and Stewart's wilt infections.

What are the pathogens/diseases that affect corn seeds and seedlings, and what is the source of these pathogens? Some common genera of "fungal" pathogens that cause one or more of the preceding symptoms are *Diplodia* (*Stenocarpella*), *Pythium*, *Rhizoctonia*, *Fusarium*, *Colletotrichum*, and *Penicillium*. Two bacterial pathogens that can affect corn seedlings are *Erwinia* [= *Pantoea*] (Stewart's wilt) and *Pseudomonas* (holcus spot). In addition, don't forget about nematodes, which also damage corn seedlings, especially in sandy soils. The source of these pathogens is typically the soil-infested residue remaining from previous years' crops and infested seed. Recently, we checked 10 seed lots for fungal infestation, and we frequently isolated *Fusarium*, *Aspergillus*, and *Penicillium* from surface-disinfested seed.

What conditions favor these pathogens? The frequency of infection and importance of these pathogens will vary and depend in part on location, seed quality (cracked or infected seed), soil temperatures less than 55°F, wet soil, soil compaction, slow emergence and growth, hybrid/inbred, fertilizer burn, herbicide injury, crusted soil, high temperatures (*Penicillium* infection), and high populations of flea beetles (Stewart's wilt). Common favorable conditions for seedling diseases are cool, wet, and compacted soil and poor seed quality. For example, *Pythium* is a common soil fungal-like pathogen that causes seed and seedling rots, and is favored by damaged seed and wet and cool soil conditions.

Which fungicidal seed treatments are most commonly used on corn, and are any new products available? Most corn seed sold in Illinois is treated with fungicides to provide protection from seed and seedling diseases. How-

ever, these chemicals are most effective for only about 2 weeks after planting, depending on soil water content and temperature. The primary fungicidal seed treatments used are of two main groups. The first group (ApronXL, Allegiance, and Apron) is most effective against *Pythium*. The second group of fungicides (Maxim and Captan are common examples) protect against the other fungi.

A new fungicidal seed treatment was labeled for corn in February 2003. The U.S. EPA approved the Syngenta Protege label as a seed treatment for field, seed, and sweet corn. Due to the late registration, treatment of commercial seed has been limited in 2003. The active ingredient in Protege is azoxystrobin, the same active ingredient in Quadris foliar fungicide (Syngenta) and one of the active ingredients in SoyGard soybean seed treatment (Gustafson). Azoxystrobin is reported to have greatest activity against *Rhizoctonia*, *Fusarium*, and *Penicillium*, and research is under way in Illinois and elsewhere to improve our understanding of its activity and efficacy against various corn seed and seedling diseases.—*Dean Malvick*

WEEDS

Weeds to Watch for in 2003

Over the past two winters, at Extension meetings throughout the state, we conducted a survey titled "The Illinois Invasive Weeds Survey." This survey was designed to determine what weeds are the most prevalent throughout the state and to give us a head start on what may be some of the emerging weed problems in the future. Results from the 2002 survey can be found in the article "Weeds on the Horizon" in issue no. 6 of the 2002 *Pest Management and Crop Development Bulletin*. Prior to last year's survey, it had been several years since a survey of this nature had been conducted in Illinois, and it is very interesting to look back and compare the results from years past.

The first question of the survey asked the participants to *rank the top 6 weed species* that they encountered most frequently in their cornfields and soybean fields. This question generated a list of more than 50 different species of weeds that grew in corn and soybeans over the past 2 years. Not surprising, waterhemp and giant ragweed were the top two weeds common in both crops. In 2002, giant foxtail was among the top three, and this year velvetleaf was added to the top-three list. These results are very different from the results obtained from a survey conducted in 1995, in which velvetleaf, common cocklebur, and giant ragweed were ranked as the most common weeds in corn, and velvetleaf, common lambsquarters, and common cocklebur as the most common weeds in soybeans.

Table 6 lists the weeds that growers, retailers, consultants, and Extension educators ranked as the top six broad-leaf weeds in corn and soybeans for 2003. This table also provides the percentage of times each weed appeared as the number one most common weed on the survey. In this survey, the annual grasses that appeared most frequently in corn were giant foxtail, fall panicum, and woolly cupgrass; and in soybean giant foxtail was the predominate grass species. In comparing this year's results to the 2002 survey, the only change that shows up is that horseweed (maretail) is added to the list of the most common weeds in soybean. Horseweed is a species that has shown up in more soybean acres across the state over the past few years. Stay tuned to next week's newsletter on why this weed has possibly become more predominate throughout the state.

The next question asked the participants to *rank the top 3 weed escapes* that they most frequently encounter in their cornfields and soybean fields, and whether they were escapes due to "late emergence" or "hard to control." The top three escapes in corn were waterhemp, giant ragweed, and woolly cupgrass; in soybeans,

waterhemp again topped the list for 2 years in a row, followed by giant ragweed and velvetleaf (Table 7). Woolly cupgrass replaced giant foxtail as one of the escapes in corn this year compared with last year's results.

The final question asked what weed species are becoming more frequent or invasive in fields, ditches, and wooded areas. The top three weeds that are becoming more *invasive in fields* are waterhemp, giant ragweed, and common pokeweed. Even though waterhemp and giant ragweed ranked extremely high in the previous questions, many growers are just beginning to see these weeds move into their fields. Giant ragweed, common pokeweed, and poison hemlock were ranked the *top 3 weeds in ditches*, and in *wooded areas* common pokeweed, poison hemlock, and poison ivy were the top three. Poison hemlock and poison ivy replaced multiflora rose and giant ragweed from the 2002 survey.

Knowing which weeds are becoming more prevalent in these areas should give us an idea of what will be the problem weeds of the future. We have seen some very consistent results from our surveys over the past 2 years and hope this information will help keep you aware of what weeds you should be looking for in your fields this coming season.—*Christy Sprague and Aaron Hager*

CROP DEVELOPMENT

Soybean Planting Considerations

Although southern Illinois is wet in places and parts of the rest of the state are getting wetter this week, corn planting is nearly completed in some places, and thoughts turn to soybean planting. Here are some considerations as we start planting soybean in Illinois:

Results from recent planting date studies clearly show that soybean yields are usually decreased by plant-

Table 6. Top six broadleaf weeds in corn and soybeans in Illinois.

Rank	Top weeds in corn	Percent		
		ranked #1	ranked #1	
1.	Waterhemp	35	Waterhemp	41
2.	Giant ragweed	30	Giant ragweed	18
3.	Velvetleaf	18	Velvetleaf	14
4.	C. lambsquarters	2	C. lambsquarters	4
5.	C. cocklebur	2	Horseweed (marestail) ^a	4
6.	Morningglory	2	C. cocklebur	4

^aNot listed as one of the top six common broadleaf weed species in 2002.

Table 7. Top three weed escapes in corn and soybeans and whether they are “hard to control” or missed due to “late emergence.”

Rank	Escapes in corn	Percent		
		Hard to control (%)	Late emergence (%)	Both (%)
1.	Waterhemp	7	68	25
2.	Giant ragweed	19	60	22
3.	Woolly cupgrass ^a	16	50	34
<i>Escapes in soybeans</i>				
1.	Waterhemp	10	53	37
2.	Giant ragweed	23	44	33
3.	Velvetleaf	31	56	13

^aNot listed as one of the top three weed escapes in corn in 2002.

ing very early (before April 20 or so) but that soybean yields do not drop as fast as corn yields when planting is delayed into mid- or late May. Yield expectations hardly change at all with planting date over the first 3 weeks of May in the central and northern parts of the state, and during the whole month of May in the southern part of the state. Of course, we want to get planting completed within a reasonable time, but it probably does not pay to plant into wet or cold soils in the first week or even the first 2 weeks of May. If it's dry enough to plant, though, there is little reason to wait for soil temperature to rise if it's May and the forecast is for average or warmer temperatures to come.

The conventional wisdom is that soybean plants should have 6 weeks of good growing weather from emergence to first flower. First flower usually occurs sometime during the first 3 weeks of July, depending on location, variety, and temperatures. Planting by May 20 or 25 in northern Illinois and by early June in southern Illinois usually provides enough growth for good yield potential. Later-planted soybeans, such as double-

cropped, develop faster in the warmer weather, but they often do not form the full canopy and vegetative growth (height and node number) needed for top yields unless flowering and vegetative growth are extended by favorable weather. Late-planted soybean should be planted in narrow rows and at higher populations to help compensate.

It helps to spread risk by planting some later or earlier varieties, but careful choice of yield and defensive traits within a maturity group is probably a better way to buffer against weather effects than going much outside the adapted maturity group for your area. In theory, later-maturing varieties should use more of the season and hence yield more. Some people also feel that early-maturing varieties can “beat the weather odds” and avoid late-season problems to yield more. Neither of these approaches is strongly supported by our research results; midseason, adapted, top-performing varieties are usually the best choice. Unless reason exists to expect unusual conditions, we would not suggest using varieties more than 0.2 or 0.3 maturity groups on either

side of midseason, adapted maturities for a given area. For example, if adapted soybeans for an area average about MG 3.0, most varieties used should be between 2.8 and 3.3.

It is still dry in parts of northern Illinois, and if the current weather pattern holds, some parts of the state could be dry for soybean planting once corn planting is completed. Some producers will thus face a common dilemma: Do I plant at normal planting depth (1.5 to 2 inches) even if the soil there is too dry for soybean germination and emergence, or should I plant 3 or more inches deep, where there seems to be enough moisture for germination? This question is more common when we have warm, windy conditions that rapidly dry soils and where fields were fall-tilled and need to be worked in the spring; each trip over the field turns up more-moist soil and allows faster drying. We haven't had much weather like this so far, and if that trend continues for a few weeks, surface soil moisture might be adequate. In some areas, soil moisture may be inadequate to depths greater than 3 inches, and it will take rainfall to get the crop to emerge regardless of how deep we plant. In both of these cases, we should plant at normal depth. In general, soil moisture patterns are not uniform throughout a field, so some soybeans planted deep will often emerge in parts of the field and not in other parts. Heavy rainfall after deep planting can also deprive seeds of the oxygen they need to germinate and emerge, can provide more time and better conditions for disease attack before emergence, and can increase the risk of soil crusting. Except in sandy soils, I tend to think that deep planting carries more risk than reward in Illinois.

Row spacing is still an issue, with continued movement to 15-inch rows, either by converting from drills to planters or by adding splitters to wide-row planters (30 inches or wider) to cut row spacing in half. Unless planting is late or soils are drought prone, research results tell us not to expect yields to differ much with row spac-

ing, from drilled (7 to 10 inches) up to 15- or 20-inch rows. With the proper variety and good growing conditions, 30-inch rows will sometimes yield as much as narrower rows. But on average, we would expect yields to drop as row width increases above 20 inches. This yield loss will vary widely over years, but it will probably average about a bushel of yield for each 4- or 5-inch increase in row width, with some acceleration in yield loss as row width rises above 30 inches. None of this means that producers who use 30- or even 36-inch rows are making a mistake; the size and condition of equipment and the numbers of acres available to pay for narrow-row equipment may support a decision to stick with wider rows. Some producers also prefer to cultivate, which gets difficult or impossible as row spacing is narrowed. Most weed control systems work well regardless of row spacing, so the need to cultivate for weed control is less of an issue today. But good yields are possible regardless of row spacing if the crop is managed well.

Seeding rate questions also arise, especially with increased seed costs. Although these figures vary considerably, we should probably expect about 85% of high-germination (90% or above) soybean seed to emerge to form plants when planted with properly adjusted row units, and 75 to 80% if drilled under good conditions using a conventional drill. Some newer drills are designed to operate more like planting units, and although the planting mechanisms on air seeders vary by brand and age, most place seed with metering and depth control somewhere between drills and planter units. Soybean seed is relatively fragile as seed goes, though, so wide swings in emergence are common. Most studies have shown that 120,000 to 150,000 plants per acre are adequate for top yield, with optimal population in wider rows typically less than those in narrower rows. The “plateau” for plant number is fairly wide: We don’t expect yields to drop until plant numbers go above 200,000 to 250,000, and even then losses are often due to more disease pressure rather than to agro-

nomie factors. But high plant populations waste seed, and they can lead to faster water loss, which can hurt yield prospects in dry years. Using the preceding numbers, drilling 200,000 seeds per acre or planting 150,000 with row units is a reasonable seeding rate for most producers, though many will fine-tune these numbers based on equipment, conditions, and experience. For a handy seeding-rate calculator, check out the soybean chapter on the *Illinois Agronomy Handbook* Web site at <http://web.aces.uiuc.edu/aim/iah>.—*Emerson D. 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

Planting had been going full speed until the widespread precipitation on April 29 and 30. Corn planting estimates range from 20% complete in the far northwest Illinois counties to 70% plus complete in many areas of the region. Some producers started planting soybeans late last week.

Even though the rainfall on April 29 and 30 halted field operations in many areas, the moisture was welcome because the soil was dry.

The winter wheat crop appears to be in good to excellent condition. Numerous oat fields emerged last week.

Southern Illinois

Continuing bands of storm fronts are keeping soils saturated, with ponding occurring in some areas. Little additional fieldwork was accomplished during the past week. Corn planted 2 to 3 weeks ago is now emerging and would benefit from sunshine and drier soils in order to green up.

Wheat is at or approaching boot stage in most areas and looks good. Some foliar diseases are beginning to show on lower leaves because of the extended cool, wet weather.

Some alfalfa fields are still being sprayed for weevil control. According to PEAQ data being collected, alfalfa is ready to harvest in the southernmost counties and is approaching harvest readiness by the first week of May along the I-70 corridor. Alfalfa growers will have to weigh the need to cut now for highest quality versus the potential damage to plant crowns that may be caused by wheel traffic on wet soils. Detailed information on alfalfa maturity development can be found on the *Illini PEAQ* Web site at <http://peaq.outreach.uiuc.edu/>.

Ron Hines, at Dixon Springs, reported intense captures of black cutworm moths at three of his four trap sites during the period of April 24–26, with the highest numbers of captures in Pulaski and Massac counties. According to average heat unit accumulations

during the past 10 years, we should obtain about 300 base 50°F heat units around May 14–15 after this flight. The April 7 intense flight of black cutworm moths should be at the 300 heat unit stage of development this week.

West-Central Illinois

Rain showers toward the end of last week left many fields too wet to work. In some areas, producers got back into the fields late last weekend only to be rained out again on Monday. Most areas are beginning to catch up on cumulative precipitation for the year, but despite recent rains, some tile lines have yet to flow, indicating that sub-soil moisture may not yet be re-charged.

Local estimates indicate that corn planting is about 60 to 70% complete. In some localized areas south of Springfield, corn planting is complete. However, less than a third of the crop has been planted in Adams County. We have received reports that some soybeans have been planted in Sangamon and Hancock counties.

Alfalfa is growing very rapidly with the recent rains and warm weather. Many established stands are 15 to 20 inches in height and are approaching optimal quality.

Insect pests are beginning to make their presence known. Intense captures

of cutworm moths continue to be observed. Reports of black cutworm and flea beetle feeding on 1- to 2-leaf corn have been received from fields in Adams County. Agronomists in Hancock and McDonough counties have reported that a number of wireworms can be found in many cornfields. Alfalfa weevil has yet to be a problem, but producers are still encouraged to be vigilant in their scouting efforts.

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Published by University of Illinois Extension and
Information Technology and Communication Services,
College of Agricultural, Consumer
and Environmental Sciences,
University of Illinois.
Editor: Erin Cler; formatter: Oneda VanDyke.

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