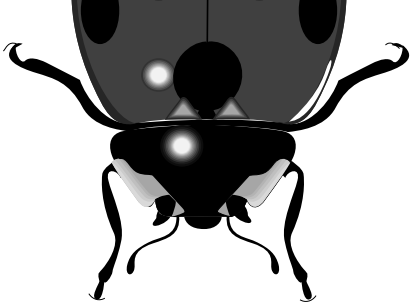

PEST MANAGEMENT & CROP DEVELOPMENT

BULLETIN

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In This Issue

Scouting Update Workshop

The "Preparing for the 2000 Season" workshop is scheduled for May 25, 2000, at the Crops Training Center, located at the Northern Illinois Agronomy Research Center near Dekalb, Illinois. The workshop is geared to crop producers and new and experienced crop scouts, as well as other individuals with an interest in crop production. Scouting techniques, economic thresholds, and damage symptoms from insects, herbicides, and other problems are part of the hands-on training. Sessions will focus on early-season problems encountered in the field and will be led by University of Illinois Extension research and teaching staff.

The cost of the program is $55.00 per person for those registering prior to the May 12, 2000, registration deadline. Late registration is $75.00 per person. CCA continuing education units have been approved for this program. For more information or to register, contact David Feltes, Quad Cities Extension Center, 4550 Kennedy Dr., Suite 2, East Moline, IL 61244, (309)792-2500, or email feltesd@mail.aces.uiuc.edu.

Voluntary "Subscriptions" to the Bulletin on the Web

For the past couple of years, a relatively small group of individuals has been receiving e-mail notification as soon as the Web version of the *Bulletin* is available, which usually occurs on Thursday mornings, or at least by noon. Recipients of e-mail notification include authors of articles, University of Illinois Extension offices, and people who paid for a Web subscription during the first year it was available. Now we would like to extend this convenient feature to a lot more people. It's nice to receive the notification because all you have to do is click on the designated Web address to be launched to the front page of the *Bulletin*. In the near future, these notifications will contain two- to three-sentence synopses for each article so that you can scan the articles, look for ones that are of interest to you, and click to be sent directly to that article. The synopses also will be a quick overview of all the contents of that issue of the *Bulletin*.

During the next few weeks, we will be placing some information at the Web site inviting you to voluntarily "subscribe" to the Web version of the *Bulletin*. You will be asked to answer a few questions, taking no more than a couple of minutes of your time. If you go through this voluntary procedure and provide your e-mail address and some other information, you will be added to the list of automatic notifications of availability of the *Bulletin*. We assure you that the information we gather will be considered private and will not be given to others. In addition to automatic notification about the *Bulletin*, you will have an opportunity to receive notification about other Extension materials and events, if you choose. You may also elect not to answer the questions.

In a future issue of this *Bulletin*, I will revisit this process, especially after we have received some feedback. In the meantime, don't hesitate to contact me if you have any questions or concerns.—*Kevin Steffey*

INSECTS

Early-Season Insects Having a Heyday in Some Cornfields

I provided an update to the Web version of issue no. 5 (April 28, 2000), covering the reports of flea beetles we began to receive late last week, and also on some bird cherry oat aphids and thrips infesting seedling corn in Richland County. Now we can add to that update a whole potpourri of insects causing problems in cornfields all over the state, especially in southern and western Illinois.

Flea beetles top the lists of the most reports of injury, the most fields sprayed, and most cussed insect of the week. We have received reports of heavy infestations of flea beetles from a lot of people all over the state. The numbers reported range from 1 to 2 per plant to 15 per plant. The type of injury observed has included the typical "windowpane" damage caused by the beetles scraping off leaf tissue, badly scarred leaves, dead leaves, wilting plants, and, in the worst cases, dead plants. Corn has been growing somewhat slowly, so the flea beetles are adding stress to the seedlings.

By now, most people are aware of the situation with flea beetles. As I stated in the previous paragraph, many fields have been and are being treated with insecticides for control of flea beetles. People who call us ask whether treatment is justified, and our response typically is, "It depends." Obviously, if infestations are extremely heavy and plants are being killed, a treatment to prevent additional loss is warranted. On the other hand, if the numbers of flea beetles do not exceed five per plant, the injury is primarily aesthetic, and the seedlings are growing rapidly, the plants will recover from the injury. It's a judgment call based on your knowledge of the situation.

Refer to issue no. 2 (April 7) and no. 3 (April 14) of the *Bulletin* for a list of insecticides to control flea beetles, information pertaining to flea beetle biology and behavior, and more in-depth discussion of Stewart's wilt.

The *bird cherry-oat aphids* and *thrips* were found in a cornfield in Richland County by Brad Yonaka with Wabash Valley Service Co. Dave Thomas with Zeneca brought in a sample of injured seedlings with the insects still actively feeding. Much of the physical damage to the seedlings had been caused by the thrips using their rasping mouthparts to feed. In addition, the leaves of the seedlings were somewhat yellow, probably as a result of the combination of the aphids' feeding and cool temperatures. Typically we do not expect bird cherry-oat aphids to cause economic damage to corn seedlings. However, whenever a corn seedling is suffering from more than one stress, the results often are more than additive.

And then, of course, some people have all the fun. On May 2, Ria Barrido with Growmark in Bloomington visited several cornfields in Randolph and Monroe counties with Dale Bermester with Gateway FS and several other individuals. Dale had observed several early-season insects feeding in these cornfields, so they returned to assess the situation. They found flea beetles and *bean leaf beetles* in all of the fields, *southern corn leaf beetles* in most of the fields, *black cutworm* larvae beginning to cut plants in some of the fields, *white grubs* and *wireworms* feeding on seeds and seedlings in some of the fields, and *grape colaspis* larvae feeding on the roots of corn seedlings in one field. The corn seedlings were in the 2- to 3-leaf stages of growth, the injury was severe enough to treat the aboveground insects with insecticides in some of the fields, and at least one of the fields was going to be replanted.

The upshot of this litany of insect pests is that our recent focus on the so-called secondary insect pests of corn apparently was justified. The mild winter and early planting this year have created a situation in which these types of pests can flourish. Although flea beetles have captured most of the attention, look for the other pests, too. The cutting injury by black cutworms in southern Illinois is a heads-up for the rest of us. The observations of the other pests suggest that we need to be vigilant during the next few weeks. A large number of insect pests can reduce corn stands. Refer to the more detailed articles about some of these pests in this issue of the *Bulletin*.—*Kevin Steffey*

Black Cutworms Are Cutting Corn Plants in Southern Illinois

Recent excursions into southern Illinois by Ria Barrido with Growmark in Bloomington, Illinois, revealed that black cutworms are already cutting corn plants in some fields. Dale Bermester, Gateway FS, Randolph County, along with Ria Barrido, discovered that 4% cutting had occurred in a field of corn at the 2-leaf stage of development. Numerous black cutworm larvae at cutting stages (4th through 6th larval instars) were present in the Randolph County field. As the guide to black cutworm development (Figure 1) indicates, fourth, fifth, and sixth larval instars have approximately 25, 21, and 14 days remaining in which they can continue to feed on corn plants. A black cutworm at these stages of development has the potential to cut three plants at the 2-leaf stage of development. Black cutworms have seven larval instars, so all the cutworms in the Randolph County field, even the sixth instars, have some growing left to do. The take-home message: those producers in southern Illinois should be checking their fields very closely. Because black cutworm development is so far along, replanted areas of cornfields could be at risk to the next generation of larvae in late May through early June. This early cutting in southern Illinois should serve as a heads-up to producers in central and northern Illinois. We encourage producers to begin looking in earnest for any black cutworm leaf

Larval instar	Head capsule width	Approximate days left to feed	Potential number of plants that may be cut		
			1 leaf	2 leaf	4 leaf
4	▪	25	4	3	1
5	▪	21	4	3	1
6	▬	14	4	3	1
7	▬	5	1	1	1

Figure 1. Guide to black cutworm development and damage in corn.

feeding that should serve as a warning that rescue treatments may be required at some point. A rescue treatment is typically triggered when 3% of the corn plants in a field have been cut and larvae are still present. Insecticides labeled for use as rescue treatments for black cutworms include *Ambush (6.4 to 12.8 oz), *Asana XL (5.8 to 9.6 oz), Lorsban 4E (1 to 2 pt), *Pounce 3.2EC (4 to 8 oz), and *Warrior T or 1E (1.92 to 3.2 oz). Those products preceded by an asterisk are restricted for use and may be used only by certified applicators. Please refer to issue no. 5 of the *Bulletin* for projected cutting dates for central and northern Illinois counties. For southern Illinois, the cutting is under way!

What other cutworms can cause injury in cornfields each spring?

The claybacked cutworm is often confused with its close relative, the black cutworm. However, the skin granules of claybacked cutworm larvae are very small, slightly convex, and set contiguously like blocks in pavement. The skin granules of black cutworms vary in size and are more isolated. These differences in the cuticle (skin) create a smoother appearance for claybacked cutworms. Additionally, the dorsal (upper) surface of claybacked cutworms is usually paler (gray to pale orange) than the lateral portions of the body. Claybacked cutworms overwinter as half-grown larvae in the soil. In essence, they get a "jump" on black cutworms when it comes to cutting each spring. Large infestations of claybacked cutworms can cause economic losses in some cornfields each year. They are most often observed in fields that were planted to clover or alfalfa the preceding year. There are no established thresholds for claybacked cutworms, but the thresholds used for black cutworms are probably reliable. Keep in mind that claybacked cutworms, because of their larger size earlier in the spring, often cause damage to very young corn plants, so a quick diagnosis is important. If an insecticide is warranted, consider the use of a product suggested for control of black cutworms.

The sandhill cutworm is whitish to tan to pale gray with seven faint, chalky-white stripes along the length of the body. Its head is tan, and its skin is translucent. Unlike the black cutworm, the sandhill cutworm overwinters in Illinois as a partially grown larva. Sandhill cutworms feed almost entirely beneath the surface of the soil, so they usually cut the seedlings off below the growing point. The end result is dead plants and a reduced stand. Although economic thresholds have not been established specifically for sandhill cutworms, the standard guideline is the same as for the black cutworm. Because sandhill cutworms overwinter as larvae in sandy soils, many producers who have had a history with these cutworms choose to apply a preventive treatment. Another species of cutworms, glassy cutworms, also overwinters as partially grown larvae. Glassy cutworms are greasy-white with reddish brown heads and are usually found in cornfields planted after sod.

Dingy and variegated cutworms are two other species of cutworms that are often noticed by producers each spring. Both of these species are regarded primarily as leaf feeders and do not present a significant economic threat. Dingy and variegated cutworms are frequently present in cornfields planted after clover or alfalfa. Like the claybacked cutworm, the dingy cutworm resembles the black cutworm, but again the skin textures differ. The dingy cutworm has smooth skin; the black cutworm has rough skin. The four dark tubercles (bumps) on the top center of the dingy cutworm are about the same size. On the black cutworm, the inside pair of tubercles is about 1/3 to 1/2 the size of the outside pair. Variegated cutworms vary in color from green-yellow to tan to nearly black and are characterized by a row of four to seven pale-yellow spots along the center of the dorsum (back). The sides of the body are paler than the top of the body, and there may be a pale orange-brown longitudinal stripe along the row of spiracles. Fully grown larvae may reach 2 inches in length.

The bottom line: identify your cutworm species properly. Mistaking dingy cutworms for black cutworms could cost a corn producer a needless expense if a field is treated. On the other hand, not reacting to an infestation of black, claybacked, glassy, or sandhill cutworms could be a costly mistake.—*Mike Gray and Kevin Steffey*

More Information About the Southern Corn Leaf Beetle

In last week's issue of the *Bulletin* (no. 5, April 28, 2000), I presented an article about southern corn leaf beetles because they had been "discovered" causing injury in western counties

again. Within the past week, I received several additional reports of these insects causing damage, some of it severe enough to require insecticide application. Most reports were from western Illinois, but as I indicated in a previous article, these pests were relatively common in Randolph and Monroe counties, too. Illustrations of this insect and the injury it causes were provided in last week's issue of the *Bulletin*.

What more can I tell you about this pest ,which seemingly remained silent for decades, until the 1990s? I've indicated many times that the only source of information about this insect I can locate is "The Southern Corn Leaf-Beetle" by E. O. G. Kelly, Bulletin No. 221, USDA, June 16, 1915. Kelly indicated in his article that the first time he witnessed these beetles' destructive habits was "in the summer of 1905, while investigating insects injurious to corn in southern Illinois." He observed them, over time, near Wellington, Kansas, in 1910 and 1913, in northern Texas in 1910, and in eastern Arkansas in 1913 and 1914. However, the earliest report of injury was in 1887, and the earliest report of severe damage was in 1900 in Ohio.

Other observations that Kelly made included the following:

- Adults overwinter, and when they come out of "hibernation," they feed on seedling corn plants.
- Early-planted corn is more seriously affected than late-planted corn.
- Adults begin laying eggs in the soil around young corn plants as soon as the plants are available.
- Egg laying occurs over a relatively long period of time.
- The larval period ranges from May 1 to July 15 at latitude 37° (approximately southern Illinois). No observations regarding length of the larval stage were offered from more northern latitudes.
- The pupal stage lasts about 15 days.
- The adults emerge around early August at latitude 37°.
- The adults are strong fliers and were "observed in fields long distances from where they originated."

It's obvious that we need considerably more information about this pest if growers have to deal with it annually, or every other year, as one grower informed me. However, I have learned at least one other bit of news that contributes to the management picture. I had stated that no insecticide was labeled for control of southern corn leaf beetles. Recently I was informed by an FMC representative that Capture 2EC is labeled for control of southern corn leaf beetles. The recommended rate of application is 2.1 to 6.4 ounces per acre. The label indicates that Capture 2EC should be applied in a minimum of 10 gallons of finished spray per acre with ground equipment. However, some of the FMC folks' experience in southern Missouri suggests that 15 gallons per acre provide better results. So at least one insecticide is labeled for control of this recently rediscovered pest, and I suspect that more will follow in the future if the problems continue to occur.—*Kevin Steffey*

Replanting Necessitated by White Grub and Wireworm Damage, and a Note About Grape Colaspis

In previous issues of the *Bulletin*, we have discussed these insects in some detail. Obviously, insecticides to prevent damage caused by these insects should have been applied in high-risk fields either before or at planting. However, as everyone knows, anticipating white grub or wireworm problems is difficult. Reports from a few weeks ago suggested that white grubs might be quite numerous in some areas this spring, but assessments of individual fields are required for making decisions about whether to treat for these subterranean pests.

Duane Frederking with Pioneer informed us that several cornfields have already been replanted as a result of white grub damage. As all of you know, there are no rescue treatments for either white grubs or wireworms. After damage by these pests is discovered, the only reasonable response is to determine whether the current stand will provide the yield hoped for. If the plant population has been reduced substantially, replanting might be the right thing to do.

If you think you need to replant because of insect damage, make certain you identify the guilty insect correctly. We know that annual white grubs can cause some injury to early-planted corn, but they do not cause as much damage as "true" white grubs. And the insecticide you decide to use during replanting, if you believe an insecticide is necessary, should be selected based on its control of either white grubs or wireworms, or both, depending on the insects in the field that is being replanted.

If you decide to use a soil insecticide during replanting, be aware that there are some restrictions regarding the amount of an insecticide that can be applied per season. For some insecticides, if you applied a full rate during the first planting, the insecticide cannot be applied during replanting because the amount will exceed the maximum allowable amount. Do not exceed the following amounts of specific products per acre per season: 7.3 lb of Aztec 2.1G; 6.5 lb of Counter CR; 13.5 lb of Lorsban 15G; 4.2 oz of Regent 4SC; 6.5 lb of Thimet 20G. The language on the label of Force 3G states: Use Force 3G only once per crop.

And as you think about white grubs and wireworms, don't forget grape colaspis, a pest that caused significant problems in west-central counties last year. The finding of grape colaspis larvae by Dale Bermester and Ria Barrido in southern Illinois indicates

that the larvae are active and could begin causing noticeable damage soon. Remember that plants injured by grape colaspis larvae resemble plants injured by white grubs—wilted leaves and purple coloration. In addition, the edges of the leaves may appear yellow or burned. Grape colaspis larvae chew off root hairs, and injured plants cannot take up water and phosphorus efficiently. I'll provide more information about this pest in next week's *Bulletin*.—*Kevin Steffey*

Wheat Producers: Cereal Leaf Beetles Are Hard at Work

Cereal leaf beetles were first detected in the United States in Michigan in 1962. This insect species can now be found throughout the eastern United States and southern Canada. At the moment, cereal leaf beetle larvae are numerous in some southern Illinois wheat fields. Of greatest concern is injury to flag leaves. If you've not monitored wheat fields for this insect pest, don't delay your scouting trip! Although cereal leaf beetles are primarily considered of economic importance in wheat, both adults and larvae may feed on oats, barley, rye, and corn. Adult cereal leaf beetles typically consume the shoots of grain plants; however, the "slug-like" larvae concentrate on leaf tissue between veins. Injured plants may take on a silvery sheen.

Adult cereal leaf beetles (3/16 inch in length) are primarily metallic blue (head and wing covers) with red-orange legs. The prothorax (body segment just behind the head) also is red-orange. Adults overwinter beneath plant debris, and during the spring they occupy their time by feeding on uncultivated grass species. Later in the spring they begin to move into cultivated fields. Adult cereal leaf beetles feed for about 2 weeks before they begin laying eggs. Eggs hatch in about 5 days, and larvae usually require 10 days to become fully grown. After the larvae finish feeding, they move to the ground, pupate in the soil, and emerge as adults after 2 to 3 weeks. Following emergence, adults feed briefly, then aestivate until cooler soil temperatures return in the fall. Fall activity by adults consists of locating suitable overwintering shelter. In all, the annual one-generation life cycle requires about 45 days.

Recently deposited eggs are elliptical, yellow, and smaller than a pinhead. Just before hatching, they turn almost black. Eggs are deposited singly or in rows of three or four but never in clusters. They are usually found close to the mid-rib on the upper surface of a leaf. The larva resembles a slug or a small glob of mud. This moving "glob" is actually an accumulation of fecal matter carried around by the larva. This unusual behavior is probably a defensive mechanism that discourages most predators and parasitoids from attacking the larval stage of this pest. However, at least three parasitic wasps use cereal leaf beetle larvae as hosts.

The potential for yield loss depends on the growth stage of wheat plants, the location of feeding injury on wheat plants, and the density of the pest. Severe injury to the flag leaf can reduce yields by 25% to 30%. An insecticide treatment may be justified when the combination of eggs and larvae averages three or more per stem. An older treatment guideline suggested that an insecticide might be warranted when one or more larvae is present per flag leaf. Products labeled for use against cereal leaf beetles in wheat include Sevin XLR Plus (1 qt) and *Warrior T or 1E (2.56 to 3.84 oz). Those products preceded by an asterisk are restricted for use and may be used only by certified applicators.—*Mike Gray and Kevin Steffey*

Current Alfalfa Weevil Situation

Not much more needs to be said about alfalfa weevils. The larvae are active throughout the state (refer to Figure 2 for heat units accumulated from January 1 through May 2, 2000), and insecticides have been and will be applied to control some of the heaviest infestations in several years. Dave Feltes, Extension IPM educator at the Quad Cities Extension Center, has indicated that the potential for weevil damage in northern Illinois is higher than it is has been for the past several years. Everyone should be scouting for alfalfa weevil larvae and looking for evidence of infection by the fungus *Zoophthora phytonomi*. The presence of *Bathyplectes* spp. cocoons also might suggest that natural control is ongoing.

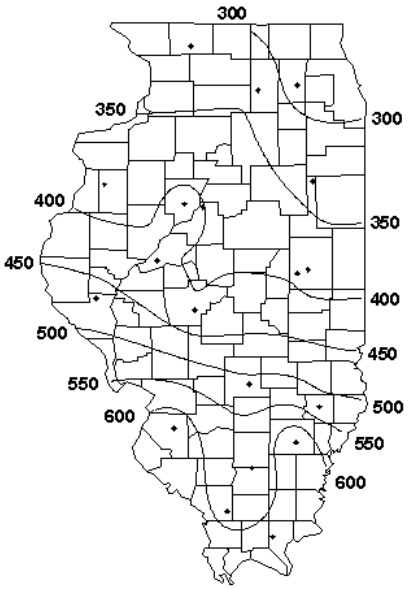

Figure 2. Actual heat-unit accumulations (base 48°F) from January 1 through May 2, 2000, for estimating development of alfalfa weevils. (Map provided by Robert Scott, Illinois State Water Survey.)

Figure 3 shows projected heat units from January 1 through May 16, 2000, which takes us well into weevil season and beyond for southern Illinois. We will discontinue producing these maps now that everyone is up to date on weevil activities. Thanks for your reports over the past few weeks. Don't hesitate to let us know if anything changes or if something significant happens in your area. Be especially alert for weevils feeding on regrowing buds after harvest. Heavy infestations and significant damage can result in slow recovery and, ultimately, reduced yields.—*Kevin Steffey*

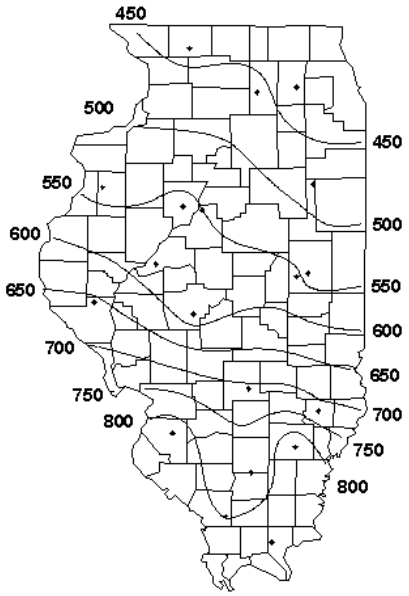

Figure 3. Projected heat-unit accumulations (base 48°F) from January 1 through May , 2000, for estimating development of alfalfa weevils. (Map provided by Robert Scott, Illinois State Water Survey.)

Newer Nozzles for Drift Management

The right amount in the right place. That seems simple enough as a goal for pesticide application, and it sums up much of the effort in selecting and calibrating application equipment. It also sheds light on some reasons why pesticide drift is a problem—it is one way to end up with the wrong amount in the wrong place. There are some recent nozzle designs available to applicators that can help control drift.

Pesticide drift is talked about in two lights: vapor drift and particle drift. While both are important, there are some new nozzles available for reducing particle drift. The key to particle drift is that it increases as wind speed increases and is caused mainly by the smaller drops created when you spray. Managing droplet size is the focus of new nozzle designs. Many of the newer nozzles incorporate two designs for drop-size control. These are the pre-orifice and the turbulation chamber.

Nozzle Improvements

In a *traditional nozzle* the exit orifice, or hole, has mainly two functions. First, it meters the amount of fluid that can be sprayed out, based on its size. Second, it creates the spray pattern, based on its shape. Many drift-control nozzles divide these two functions between two separate orifices. The pre-orifice, or first hole, meters the flow of the fluid when it enters the nozzle. The liquid then leaves the nozzle through the exit orifice, where the spray pattern is formed. This reduces pressure on the liquid as it exits, resulting in larger drops.

A *turbulation* or *mixing chamber* is another feature of many drift-reduction nozzles. In this chamber of the nozzle, there is extra room for the liquid to expand and slow down before it is sprayed out. This puts less energy behind the liquid when it is sprayed out, creating larger drops and a more uniform pattern.

The Nozzles

Two of the most talked-about types of nozzles today are air-atomizing nozzles and the turbo flat-fan nozzle.

Air-atomizing nozzles are available from numerous manufacturers by different trade names. These nozzles use a pre-orifice and then draw air into the mixture through a carburetor-like venturi. The air and liquid pass through a mixing chamber and are sprayed out together. The exit orifice is larger than on traditional nozzles because, in addition to the liquid of the spray, the incorporated air must also pass through. The larger exit orifice works with the pre-orifice and mixing chamber to produce larger droplets. Air bubbles are not present in the droplets when spraying only water but may be present when using certain chemicals or adjuvants. Manufacturers list operating pressures for these nozzles between 30 and 100 psi.

The turbo flat-fan nozzle also uses a pre-orifice and turbulation chamber but does not draw air into the spray mixture. The liquid is metered by the pre-orifice before it passes through a turbulation chamber, where the pressure on the spray is reduced. The spray then exits through a slot, forming a flat-fan pattern. These nozzles show very good pattern uniformity and drift reduction over a wide range of pressures. The manufacturer lists operating pressures for these nozzles between 15 and 90 psi.

Using Drift-Control Additives

There are many adjuvants available that are marketed for reducing spray drift. Research and field use have shown that these additives can greatly reduce spray drift when used with traditional nozzles. Those who want to use drift-reduction additives along with one of the new drift-reducing nozzles may be concerned about the effect on spray pattern. It is important to check the pesticide label and compare the recommended droplet size for the application to the droplet size the nozzle will produce. Droplets produced by drift-reducing nozzles may require less of an increase in size than droplets from traditional nozzles. This means that different nozzles may require different rates of a drift-control additive.

To determine how much drift control additive to use, begin with its label. Try the rates out with clean water before spraying, starting at the low-use rate. Observe the spray pattern to see if the nozzle will function properly within its operating pressures and that the spray patterns achieve the proper overlap. Work up to higher rates if necessary, but, if the pattern is too narrow or stringy, use a lower rate. Spending a little time determining a good rate can prevent an encounter with a few hundred gallons of unsprayable goo.

Take a Look

New nozzle designs available can give applicators good options in controlling drift. It is worth the time to flip through a nozzle catalog and see what is new in pesticide application today that can provide benefits in reducing drift.

PLANT DISEASES

Wheat Problems Continue to Expand

Reports of wheat streak mosaic virus (WSMV) continue to come in from the wheat-growing areas in the southern part of the state. I just received the first report of WSMV symptoms from Iroquois County this morning, so it would seem the epidemic may not be limited to the southern part of the state. The southwestern part of the state seems to have been hardest hit by the epidemic. Omar Koester, Extension assistant, Randolph/Monroe Unit, and Mark Hoard, Dennis Epplin, and Robert Bellm, Regional Extension IPM and crop educators, have put in considerable time with regard to the virus epidemic this season. Please refer to the previous two issues of the *Bulletin* for further discussion of symptomatology and epidemic development.

Unfortunately a few other diseases are also present in the wheat crop. Ria Barrido of Growmark reports both barley yellow dwarf virus and a fungal root disease, take-all, on wheat in Perry County. These are diseases we are certainly more familiar with in Illinois.

Barley yellow dwarf virus (BYDV): Aphids spread BYDV disease. Aphids carrying the virus transmit the virus to wheat plants through their saliva when they feed. Serious yield loss results from fall infection by viruliferous aphids feeding on wheat seedlings. Fall infections typically are expressed as stunted plants with fewer tillers when spring growth resumes. Leaf discoloration is usually the most notable early-season symptom. Leaves may be varying shades of red to purple, pinkish-yellow to brown. As the plant continues to grow, older leaves typically begin to die back from the tip and may feel somewhat leathery while the new leaves begin to discolor. Symptoms from fall infections should have shown up 1 to 1 1/2 months ago. Spring infections occur as well but commonly only discolor the flag leaf and do not cause significant yield reductions. This is a similar situation to wheat streak mosaic where spring infections are not nearly as significant as fall infections.

The most common method of virus management is to plant resistant wheat varieties. There are very limited choices with regard to BYDV in that arena, though. Other control measures are directed at reducing the time the plants are in the field when vectors are active, which explains the recommendation to plant after the fly-free date when insect activity is reduced. Systemic insecticide seed treatments such as Gaucho have also shown some success.

Yield loss from foliar blights in wheat: Recent timely rains may have been conducive for development of foliar fungal blights on wheat crops. Plants already infected with virus disease can also host fungal infections. Keep an eye out for fungal leaf blight development this week. How can you decide if the infection warrants fungicide treatment? With wheat about $2.30 as I write today, it isn't likely that a fungicide application is a good economic decision, although it may still be a good disease-management decision.

The flag and flag-1 leaves contribute the most to final yield of the plant. In general, you can expect a yield loss in the range of 1 bushel per acre for each 5% leaf tissue infected on either of these two leaves. To make your decision whether or not to spray, you will need to determine your yield potential. A rough way to determine yield potential is to count the number of tillers per square foot and multiply by 1.5. Then consider that fungicides can generally provide yield increases of 10% to 20% in fields where diseases are economically important compared to an untreated field. Next determine the cost of the fungicide plus application at approximately $16 to $26 per acre, depending on material and type of application. With wheat at $2.30, yield increases of 7 to 11 bushels would be needed to cover the cost of treatment. For this scenario you would need approximately a 70- to 100-bushel yield potential. Putting a pencil to it with your own cost estimates and yield potential will help you make the decision whether a fungicide application will benefit you this season.

That is enough news on wheat disease this week. Look for a discussion of take-all in next week's *Bulletin.*—*Suzanne Bissonnette*

WEEDS

Soil-Applied Herbicides for Soybeans

With the majority of Illinois corn acres planted, many growers are turning their attention to planting soybeans. While many have already decided on a weed-management program for this year, there may be some producers still uncertain about how they want to manage their weed spectrum. There are a number of factors a grower needs to consider when making these decisions: (1) Will tillage be a part of the management program, or is no-till production selected for this season? (2) If no-till, was there or will there be an opportunity to apply a burndown to control existing vegetation before planting? (3) What weeds are expected to emerge during the growing season in a particular field? (4) What row width are the soybeans planted in (drilled, 15", or 30"), and will there be the opportunity to cultivate after soybean emergence? (5) What type of herbicide program should be used: a "one-shot" soil-applied program, a planned sequential program (soil-applied followed by postemergence), or a total-postemergence program? Taking all of these questions into consideration will be important in making a wise decision as to the type of weed-control strategy to use for your soybeans this season.

If a soil-applied herbicide is part of your management strategy, there are several new soil-applied herbicide premixes available this season: Do-

Table 1. Soil-applied soybean herbicides: broadleaf efficacy ratings.

Herbicide	*Burcucmber*	*Cocklebur, common*	*Jimsonweed*	*Kochia*	*Lambsquarters*	*Morningglory*	*Nightshade, eastern black*	*Pigweeds*	*Ragweed, common*	*Ragweed, giant*	*Sida, prickly*	*Smartweeds*	*Sunflower, wild*	*Velvetleaf*	*Soybean response*
Soil-applied "grass"															
Axiom	N	N	4	5	7	N	6	7	5	N	N	6	N	N	1+
Dual II Magnum	N	N	4	N	6	N	**8**	**8**	5	N	N	N	N	N	1
Frontier	N	N	4	N	6	N	**8**	**8**	5	N	N	N	N	N	1
Micro-Tech	N	N	4	N	6	N	**8**	**8+**	5	N	N	N	N	N	1
Pendimethalin	N	N	N	7+	**8**	N	N	**8+**	N	N	N	4	N	6	1+
Trifluralin	N	N	N	7+	**8+**	N	N	**8+**	N	N	N	4	N	N	1+
Soil-applied "broadleaf"															
Command	N	6	**8**	**9**	**8+**	N	5	5	**8**	5	**8+**	**8**	4	**9**	1
Sencor	N	6	7+	**8**[a]	**9**[a]	N	N	**9**[a]	**8+**	5	**8**	**9**	6	**8**	2
Canopy	7	**8+**	**9**	**8**[a,b]	**9**[a]	**8**	5	**9**[a,b]	**8+**	**8**	**9**	**9**	**8+**	**8+**	2
Canopy XL	7	**8+**	**8+**	**8**[b]	**9**	**8+**	**8+**	**9**[b]	**8+**	**8**	**8**	**9**	7+	**8+**	1+
Authority	-	5	7	7+	**8+**	**8+**	**8+**	**8+**	6	6	**8**	7+	4	7	1+
Python	N	7	**8**	**8+**[b]	**8+**	6	7	9[b]	7+	5	**8**	**8**	7	**8**	1
FirstRate	-	**8+**	**8+**	**8**[b]	**8+**	**8**	4	**8+**[b]	**9**	**8**	7	**8**	**9**	**8**	1
Pursuit	5	7	7	**8**[b]	**8**	7	**9**	**9**[b]	7	6	**8**	**8+**	**8**	**8**	1
Scepter	7	**9**	**8**	5	**9**	7	**8**	**8+**[b]	**8+**	**8**	**8+**	**8+**	**9**	7	1

Control ratings: **9** = excellent, **8** = good, 7 = fair, 6 = poor, 5 or 4 = unsatisfactory, N = no control. Boldface indicates acceptable control.
[a] Control is much less on triazine-resistant biotypes of pigweeds, lambsquarters, and kochia.
[b] Control is much less on ALS-resistant biotypes of pigweeds/waterhemps and kochia.

For herbicide ratings for tank mixtures or premixtures, see the component parts:

Premix	**Grass**	**Broadleaf**
Backdraft	*glyphosate*	Scepter/*glyphosate*
Boundary	Dual Magnum	Sencor
Broadstrike + Dual	Dual	Python
Broadstrike + Treflan	Trifluralin	Python
Domain	*flufenacet*	Sencor
Extreme	*glyphosate*	Pursuit/g*lyphosate*
Pursuit Plus	Prowl	Pursuit
Squadron	Prowl	Scepter
Steel	Prowl	Pursuit + Scepter
Turbo	Dual	Sencor

Table 2. Soil-applied soybean herbicides: grass and nutsedge efficacy ratings.

	Annuals									*Perennials*			*Volunteer Crops*		
Herbicide	*Barnyardgrass*	*Crabgrass*	*Cupgrass, woolly*	*Foxtail, giant*	*Foxtail, yellow*	*Panicum, fall*	*Sandbur*	*Shattercane*	*Johnsongrass*	*Muhly, wirestem*	*Nutsedge, yellow*	*Quackgrass*	*Cereals, volunteer*	*Corn, volunteer*	*Soybean response*
Soil-applied "grass"															
Axiom*	**9**	**8**	6	**8**	**8**	**8**	5	4	N	N	5	N	N	N	1+
Dual II Magnum	**9**	**9**	7	**9**	**9**	**9**	6	5	N	N	**8**	N	N	N	1
Frontier	**9**	**9**	7	**9**	**9**	**8+**	6	5	N	N	7+	N	N	N	1
Micro-Tech	**9**	**9**	7	**9**	**9**	**9**	6	5	N	N	7+	N	N	N	1
Command	**9**	**8+**	7+	**9**	**8+**	**9**	**8**	7	N	N	N	N	**9**	5	1
Pendimethalin	**9**	**9**	**8+**	**9**	**9**	**9**	**8**	7+	N	N	N	N	6	5	1+
Trifluralin	**9**	**9**	**8+**	**9**	**9**	**9**	**8+**	**8**	N	N	N	N	6	6	1+

Control ratings: **9** = excellent, **8** = good, 7 = fair, 6 = poor, 5 or 4 = unsatisfactory, N = no control.
Boldface indicates acceptable control.
*At current rate for soybeans, Axiom will provide only 3 to 5 weeks of weed control.

main, Boundary, Extreme, and Backdraft. For more information on these new products, refer to the article *New Herbicides for 2000* in issue no. 1 of the *Bulletin*. Herbicide efficacy ratings for many soil-applied herbicides are presented in Tables 1 and 2. These tables are reproduced from the *Illinois Agricultural Pest Management Handbook 2000*. Keep in mind that a number of these soil-applied herbicides also have some foliar activity on certain winter and smaller summer annual weed species and may help control existing vegetation prior to planting soybeans in no-till situations.—*Christy Sprague and Aaron Hager*

Annual Bluegrass and Butterweed

Several samples and calls were received this past week regarding a couple of weed species that are currently common in Illinois no-till fields. Annual bluegrass *(Poa annua)* can exist as a winter annual species and appears to be becoming more common in many Illinois fields. At present, this species is beginning to or has already reached the "heading" stage and will shortly begin to die back. Some callers have indicated that a burndown herbicide application had failed to control annual bluegrass and were curious as to why. It appears that, since the weed is entering the later stages of its life cycle, it may be somewhat less susceptible to a burndown herbicide application than it would be if the same treatment had been applied earlier during its development. Annual bluegrass typically completes its life cycle by the end of May or first week of June, so re-treating for this species may not always be necessary.

Butterweed *(Senecio glabellus)* has begun to flower, and, in fields where the population is sufficiently heavy, the field appears to be a "sea of yellow." The bright yellow flowers and basal leaves of butterweed often mislead people to assume it's a mustard species, when in actuality it belongs to the aster *(Asteraceae)* family. The stem is hollow and often purple in color. Butterweed was discussed in issue no. 2 of the *Bulletin*, "A Sea of Purple," and the Web version of this article has several pictures of this species.— *Aaron Hager and Christy Sprague*

CROP DEVELOPMENT

Nitrogen Loss in 2000

Producers in most areas of Illinois are more concerned with too little, not too much, soil moisture. However, there are a few areas that have had enough rain that there is a potential for nitrogen loss should we get heavy rains in late May or early June. If you are

among the fortunate ones that have had enough water that you could have a problem and you fall-applied nitrogen, particularly if you applied it early and did not use a nitrification inhibitor, you may want to consider applying 50 to 60 pounds of nitrogen in two or three strips through fields that have had nitrogen-loss problems in the past. The strips need only be one pass of an applicator in width, and you might spread them out across the field if there are substantial soil differences to include.

The corn growing in strips that received the added nitrogen can help indicate whether or not to apply more nitrogen to the rest of the field. Starting in early June, periodically compare the color of the corn in the treated strips to adjacent nontreated areas. If the nontreated areas start to show yellowing on the third or fourth leaf from the bottom, add 50 to 60 pounds of nitrogen to the rest of the field. If you have access to a SPAD meter, starting in mid-June, compare the readings on the leaf immediately below the one with collar showing or the leaf opposite and below the ear on treated versus nontreated corn. When the SPAD meter reading of the nontreated is less than 90% of the treated, apply additional nitrogen. Experimental results have shown that application of supplemental nitrogen, as late as tasseling, to corn that is deficient in nitrogen will result in yields as good as from areas that did not show deficiency.

Success from late nitrogen applications requires that you correctly identify the deficiency early and that you receive adequate rain to move the nitrogen into the rooting zone for uptake. The first of these requirements can be met by using the above-suggested program, but the latter requires cooperation from Mother Nature.—*Robert Hoeft*

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 form the East Southeast district)

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

East-Central Illinois

Mother Nature seems to be spoon-feeding us rain. If you count back to the first of the year, we are only about 2 inches below normal, but if you look back to last September, we are 6 to 8 inches behind.

Most cornfields are planted and many of those have emerged. Growth has been very slow, and this has caused continued concern with flea beetle injury in some fields. Annual white grubs have also been found in several fields.

A few soybean fields went in early, but widespread soybean planting is now under way.

Many wheat fields are in marginal condition due to thin stands and possible viral problems. There are reports of fungicide applications but no reports of actual fungal wheat problems.

Rainfall during Sunday night through Monday varied from a trace to 3/4 inch.

Black cutworm moth captures were sporadic with no intense captures reported.

Planting progress has moved ahead rapidly the past few days, with many finishing corn and moving to soybeans.

Early-planted corn has emerged, and corn planted 2 weeks ago is just spiking through. Warm temperatures the last few days have decreased emergence time considerably, with some later-planted corn emerging the same time as much earlier-planted corn.

Some flea beetle treatments have been applied to approximately 2-leaf corn.

Alfalfa weevil and clover leaf weevil activity escalated the past few days since the weather has warmed. The potential for weevil damage is higher than it has been for the past several years across northern Illinois. Alfalfa weevils are ranging in size from first to second instar, and clover leaf weevils are 3/8 to 1/2 inch in length. A few alfalfa fields have been treated for weevils.

Alfalfa height is 16 to 18 inches.

Bean leaf beetles are very noticeable and hungrily waiting for soybeans to emerge.

Southern Illinois

Wheat: Wheat in Feekes stage 10 to 10.5. Wheat curl mite identified on wheat collected from Perry and Franklin counties. Wheat streak mosaic confirmed in Randolph, Monroe, Washington, Franklin, and Perry counties. Infections spotty, with some crop destruction occurring in Randolph and Monroe counties. Some cereal leaf beetle feeding in Monroe County.

Corn: Planting continuing, with some come river bottom corn 2–3 true leaves. Upland crops 1–2 true leaf stage. Some black cutworm feeding in earlier-planted corn (Franklin County). Flea beetle and southern corn leaf beetle feeding in some fields. Japanese beetle grubs found in corn (Monroe County).

West-Central Illinois

- Almost all corn is planted and emergence is good. One comment that was made is that "it couldn't have gone in any better." However, there has been some corn replanted due to crusting problems.
- Insect problems reported include flea beetle, black cutworm, wireworm, white grubs, and southern corn leaf beetle. Cutworm clipping has been reported by a farmer in Montgomery County in a field that was planted on April 12, and several fields have been treated for southern corn leaf beetle in Pike and Scott counties. Some replanting has occurred because of wireworm and white grubs.
- Corn leafing out underground and poor rooting have also been reported in some of the drier areas.
- Soybean planting is about one-third complete and progressing rapidly each day. Late March soybeans are emerged and in unifoliate state.
- A commercial hay producer in Christian County reported beginning alfalfa harvest on April 25. It yielded 3.85 tons/acre at 54% moisture, 225 RFV, and 26.5% CP. Harvested acres are being treated for alfalfa weevil.
- Wheat looks fairly good; no pest problems reported. Some producers are concerned about possible nitrogen loss where all was applied last fall.
- Quincy airport reported less than 1 inch of rain for April.

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