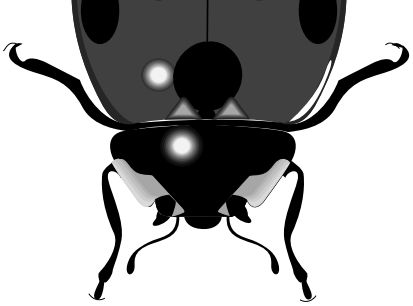

PEST MANAGEMENT & CROP DEVELOPMENT

BULLETIN

FOR IMMEDIATE RELEASE
No. 10 / May 28, 1999

Executive editor: Kevin Steffey, Extension Entomologist

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In This Issue

Crop Update Workshop

Weed problems, crop growth, and insect and disease outbreaks will be the topics of the day at the Crop Update Workshop to be held on June 15 at the Crops Training Center, Northern Illinois Agronomy Research Center, near Shabbona, Illinois. This roundtable-style workshop is designed to answer your questions about current conditions during this growing season.

Registration for the workshop will open at 8:30 AM; the workshop begins at 9:00 AM. University specialists and extension educators will be on hand to discuss current crop conditions, pest problems, and management alternatives. Adjournment is scheduled for 11:30 AM.

There is no preregistration. Registration at the door is $5.00. The fee covers expenses for handout materials and refreshments. Certified Crop Advisor credits of 1 CM and 1.5 IPM have been approved.

Other Crops Training Center workshops to place on your calendar are the in-depth Insect Workshop on July 14 and the in-depth Disease Workshop on August 19. Additional information about the Crop Update and other workshops is available from the Rockford Extension Center, telephone (815) 397-7714.—*Ellen Phillips*

INSECTS

Monarchs, *Bt* Pollen, and Hysteria

During the most recent week, we received many e-mails and telephone calls concerning the published report in *Nature* by Dr. John Losey and colleagues that detailed the potential negative effects of *Bt* pollen on survival of monarch butterfly caterpillars. The results of their investigation indicated that when monarch larvae consumed *Bt* pollen on milkweed leaves, they developed more slowly and died more readily than larvae that ate non-*Bt* pollen or leaves without pollen. The research was conducted at Cornell University *in the laboratory. Bt* pollen (N4640-*Bt* corn) was obtained by "gently tapping a spatula of pollen over milkweed *(Asclepias curassavica*) leaves which had been lightly misted with water." The concentration of pollen (*Bt* and non-*Bt*) was adjusted to visually approximate that of milkweed leaves obtained from cornfields. Five monarch larvae (3 days old) were placed on milkweed leaves. Treatments were replicated five times. After 4 days of feeding, monarch larval survival (56 percent) on *Bt* corn pollen-treated leaves was much less than on the other two treatments in which no mortality occurred. Interestingly, both types of pollen (*Bt* and non-*Bt*) lowered the milkweed consumption rates of monarch larvae. However, consumption of milkweed tissue by monarch larvae was twice as great on leaves dusted with non-*Bt* pollen than on leaves dusted with *Bt* pollen. On average, monarch larvae that ate *Bt* pollen weighed less than half that of larvae consuming milkweed leaves with no pollen.

Research that was largely ignored by the media appeared in the *Proceedings of the North Central Branch Meeting of the Entomological Society of America* held in Des Moines, Iowa, March 28–31, 1999. Laura Hansen and

John Obrycki, entomologists with the Department of Entomology at Iowa State University, published an abstract entitled *Non-target Effects of Bt Corn Pollen on the Monarch Butterfly (Lepidoptera: Danaidae)*. (The full abstract may be viewed on the Web at the following address: http://www.ent.iastate.edu/entsoc/ncb99/prog/abs/d81.html.) Researchers from Iowa State University examined the density of *Bt* pollen on milkweed leaves from plants collected within a cornfield as well as 0, 1, and 3 meters from the edge of the field. Not surprisingly, the highest concentration of *Bt* pollen was found on leaves from milkweed plants collected from within the cornfield. Likewise, the lowest density of pollen occurred on leaves found on plants 3 meters from the edge of the cornfield. Leaves from milkweed plants within and adjacent to the *Bt* cornfield were used to expose first-instar monarchs to *Bt* and non-*Bt* pollen. Within 48 hours, 19, 0, and 3 percent mortality was observed in the *Bt* pollen, non-*Bt* pollen, and no pollen control treatments, respectively. What do the findings from these two preliminary studies suggest?

First of all, more robust field studies are required to examine the potential ecological effects of *Bt* pollen on monarch populations, as well as on other lepidopteran species. More careful research clearly is warranted. How interested will industry be in supporting more intensive studies that might shed light on this topic? Second, rather than criticize the research reported by scientists from these two universities, industry representatives should concentrate on articulating the many proven economic and environmental benefits of using transgenic insecticidal cultivars for the management of European corn borer. By attacking these new and interesting findings concerning monarch survival, the debate over the wisdom of using genetically modified organisms in pest management programs becomes more politically charged. Ultimately, producers may be the losers in this new high-stakes crop protection arena in which we find ourselves.—*Mike Gray, Kevin Steffey*

Black Cutworms Are Busy Reducing Stands in Cornfields

Doug Gucker, University of Illinois Extension, Piatt County, reported on May 25 that a number of cornfields in Piatt County had black cutworm infestations with cutting in the 4 to 6 percent range. Damage in some fields was severe enough to warrant replanting. Much farther north, Jim Blackburn, Terra Industries, reported that a cornfield in northeastern Lee County had 3 percent of the plants cut, with 30 percent of the plants displaying leaf feeding. For approximately a week, John Grandin, Spoon River FS, Inc., Knoxville, has observed economic levels of cutting in cornfields located in Fulton and Knox counties. Some producers who were required to apply rescue treatments for black cutworms are beginning to question the wisdom of the rescue approach. Don't forget the following facts: (1) rescue treatments typically offer superior control to that of planting-time soil insecticide applications, (2) black cutworms are occasional pests and infestations are very sporadic, and (3) the wait-and-see approach to black cutworm management makes economic and environmental sense.

A number of producers this week indicated that because they got busy with soybean planting, they neglected to monitor cornfields and suffered some economic levels of cutting. In some instances, replanting portions of cornfields will be necessary. A question frequently asked was, "Do I need to apply an insecticide spray to the area of the field that will be field cultivated or disked before I replant?" Research conducted by Dr. William Showers, USDA-ARS, Iowa State University, and published in 1985 indicated that when tillage operations or herbicide treatments were applied 8 or 14 days prior to planting, minimal cutting of corn seedlings occurred, presumably because cutworm larvae starved. If tillage operations and herbicide treatments were delayed until 2 days prior to planting or were made the same day of planting, more corn plants were cut. The researchers believed that corn plants emerged before significant numbers of black cutworms starved. These entomologists assumed that cutworm larvae survived on plant debris (at least 10 days) until corn emergence occurred. So, although tillage prior to replanting will likely increase the level of black cutworm mortality, these insects are resilient and may still inflict cutting to newly emerging corn seedlings. If an insecticide is not used prior to replanting, these fields should be monitored very carefully and a rescue treatment applied if needed.—*Mike Gray*

Wireworm Headaches Continue

In 1999 we may have encountered some of the worst infestations of wireworms we have witnessed in several years. We have received numerous reports of significant infestations in cornfields in several areas of the state. Replanting has been necessary in several instances, and some growers currently are debating whether a plant population of 17,000 plants per acre (down from an initial 28,000 plants per acre) is sufficient. The main question on many growers' minds is, "How much longer will the wireworms cause damage in the fields?"

The answer to that question is not known, even by experts. We know that wireworm larvae move downward in the soil when soil temperatures warm up; however, we are not certain when the soil temperatures will exceed the threshold temperature (approximately 70˚F). The recent cool conditions likely will not force wireworms deeper into the soil any time soon. Therefore, we strongly recommend that fields infested with wireworms be monitored daily to determine if plant populations continue to decrease. One individual I spoke to indicated that newly wilted plants in one field were evident from one day to the next. Wireworms were

still active in that field, and plants were continuing to die. The field was heavily infested, so the likelihood for more stand reduction was high.

Refer to issue no. 8 (May 14, 1999) of the *Bulletin* for suggestions for seed treatments or soil insecticides for replanted corn.—*Kevin Steffey*

Reports of Injury Caused by Annual White Grubs

This year we have received several reports of injury to seedling corn plants caused by annual white grubs, including Japanese beetle grubs. Although in the past we have stated that annual white grubs cause little injury to corn seedlings, the events this year and last year suggest that we need to reconsider. Our previous statements were based on research conducted at Iowa State University. However, recent studies conducted at Purdue University reveal that annual white grubs, under some circumstances, can cause noticeable injury to corn seedlings. In the past, when corn was planted during May, for the most part, annual white grubs had almost completed their feeding by the time the seedlings had any size. However, now that planting begins in some areas of Illinois in late March and early April, corn seedlings are exposed for a longer period of time to annual white grubs that become active early in the spring.

If you encounter a white grub problem in a field, it's still a good idea to check out the types of grubs causing the injury. Refer to issue no. 2 (April 2, 1999) of the *Bulletin* for illustrations of the rear ends (rasters) of true white grubs, annual white grubs (grubs of the southern masked chafer), and Japanese beetle grubs. The arrangement of hairs on the raster will help you distinguish among the three types of grubs. If you have midsized true white grubs (3-year life cycle), you can anticipate grubs in the field again next year.—*Kevin Steffey*

Corn Rootworm Egg Hatch: An Update

Corn rootworm eggs should be hatching the last week of May across much of central Illinois. When 380 to 426 heat units (base 52˚F) have accumulated (since January 1), as many as 50 percent of the corn rootworm eggs should have hatched. Figure 1 reveals that as of May 24, between 300 and 400 heat units (base 52˚F, 4-inch soil temperature) had accumulated since January 1 across a broad band of central Illinois. After you return from the Memorial Day weekend, don't be surprised if you begin to hear of reports of rootworm feeding. The first instars will be quite difficult to find since they are primarily internal root feeders. Overall, establishment of corn rootworm larvae is expected to be much better in most cornfields this spring. For those producers whose fields received heavy precipitation, if standing water is present, corn rootworm larval survival will be very poor. Let us know when you discover your first corn rootworm grub of the season.—*Mike Gray*

Stalk Borer Heat-Unit Update

As we have indicated several times, stalk borers first begin to move into cornfields when 1,100 heat units (base 41˚F, from January 1) have accumulated. Fifty percent movement occurs when approximately 1,400 to 1,700 heat units have been reached. Figure 2 suggests that as of May 24, initial movement of stalk borers into susceptible cornfields should begin across many northern counties. By Memorial Day weekend, don't be surprised to learn of stalk borer injury even in the northernmost areas of the state. Please refer to issue no. 8 (May 14, 1999) of the *Bulletin* for the complete story on this troublesome insect pest. As Kevin Steffey indicated previously, *timing is everything* for stalk borers.—*Mike Gray*

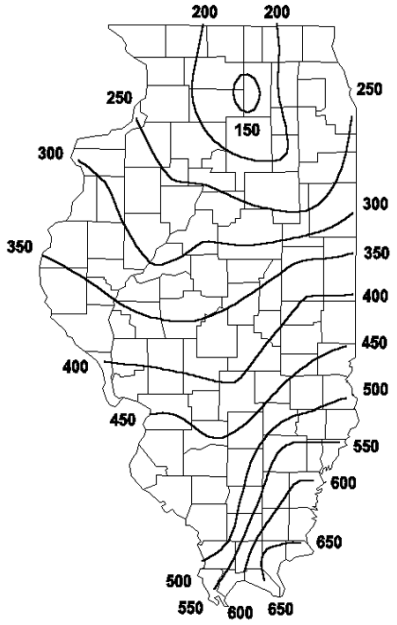

Figure 1. Actual 4-inch soil temperature heat-unit accumulation (base 52˚F), January 1 to May 24, 1999. (Map provided by Robert Scott, Illinois State Water Survey.)

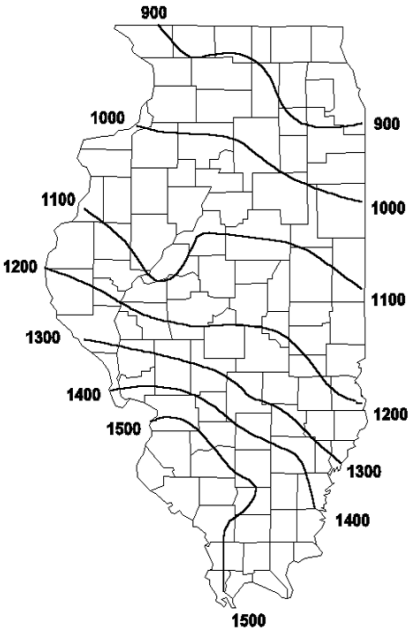

Figure 2. Actual heat-unit accumulation (base 41˚F) from January 1 to May 24, 1999, for estimating development of stalk borers. (Map provided by Robert Scott, Illinois State Water Survey.)

Bean Leaf Beetles and Seedling Soybeans

Now that soybeans have emerged or are emerging throughout Illinois, bean leaf beetles, which have been active for at least a month, are leaving alfalfa fields and colonizing soybean fields. The beetles will feed on soybean seedlings, and the females will lay eggs in the soil to begin the next generation. As growers keep watchful eyes on their emerging crops, some may overreact to seedling defoliation. We have indicated for at least a couple of years that recent research findings suggest that our old thresholds for bean leaf beetles were too low. The new thresholds, based on solid research from the University of Nebraska, indicate that at least 16 beetles per foot of row during the early seedling stage of growth or 39 beetles per foot of row at soybean stage V2+ are necessary for economic damage.

If the density of bean leaf beetles in a soybean fields exceeds one of the aforementioned thresholds, an insecticide may be warranted. The following products are suggested for control of bean leaf beetles in soybeans: Ambush 2E* at 3.2 to 6.4 oz per acre; Asana XL* at 5.8 to 9.6 oz per acre; dimethoate (see labels for rates of application; several formulations are available); Lorsban 4E at 1 to 2 pt per acre; Penncap-M* at 2 to 3 pt per acre; Pounce 3.2EC at 2 to 4 oz per acre; Sevin XLR Plus at 1 to 2 pt per acre; and Warrior T or 1E at 1.92 to 3.2 oz per acre. (The use of products followed by an asterisk is restricted to certified applicators.)—*Kevin Steffey*

Keep Watching for Alfalfa Weevils in Northern Counties

Much of the first crop of alfalfa has been cut in southern and central Illinois, and harvest is upon us in northern Illinois. Growers should keep watching for alfalfa weevils, either on the first crop or in the stubble as the second crop greens up. Alfalfa weevil activity was relatively intense for about 3 weeks this spring, and some economic infestations linger. However, Matt Montgomery, Extension Unit Assistant/Crop Systems in Sangamon and Menard counties, found some alfalfa weevil larvae infected with the fungus *Zoopththora phytonomi*. The cool, wet weather has been ideal for the development of epizootics of this natural control factor. Unfortunately, the fungus did not keep weevil densities from reaching economic levels in many fields. Nevertheless, the presence of discolored weevil larvae curled around alfalfa stems or leaves suggests that the disease could be having an impact. Before making a decision to spray an insecticide, try to determine whether alfalfa weevils are healthy or diseased.

For the best management strategies for alfalfa weevils, including early cutting and suggestions for insecticides, refer to issues no. 6 and 8 (April 30 and May 14, respectively) of the *Bulletin.* Take note of harvest intervals if an insecticide is used.—*Kevin Steffey*

WEEDS

Welcome to Dr. Christy Sprague

We are delighted to announce that Dr. Christy Sprague has recently begun her duties as an assistant professor of Extension Weed Science. Dr. Sprague received her B.S. in Crop and Soil Sciences from Michigan State University and an M.S. in Weed Science from the University of Illinois, and she recently completed her Ph.D. in Weed Science at Michigan State University. She will soon be making contributions to this newsletter as well as diagnosing samples at the Plant Clinic, conducting applied weed science research, speaking at a variety of meetings, and participating in the many other duties and responsibilities of Extension Weed Science. Christy has an excellent research background and will make significant contributions to the weed science program at the University of Illinois. We are indeed fortunate to have Dr. Sprague as a part of our faculty.—*Aaron Hager, Marshal McGlamery*

Corn Injury from Balance Herbicide

The number of phone calls and plant samples received during the past week concerning corn injury from **Balance (isoxaflutole)** herbicide increased significantly. Although it is not feasible to estimate the percentage of treated acres affected, injury appears to be generalized across much of Illinois. While the 1999 growing season marks the initial year of Balance commercialization in Illinois, many universities have evaluated this herbicide in research trials for several years, and few have reported corn injury as severe as is currently expressed in many producer fields. So what appears to be different this year as compared to previous years, when little or no injury was reported? What are the symptoms of Balance injury?

Mode of Action of Balance

Pigments are a group of compounds produced within the plant that function in a variety of processes. The best known plant pigment is chlorophyll. Chlorophyll absorbs several wavelengths of visible light during the process of photosynthesis and passes along the absorbed energy to electron carriers involved in the "light" reactions of photosynthesis. Although chlorophyll can absorb several wavelengths of visible light, green light is not well absorbed; most of the green light is reflected from the leaf, and thus plants appear green in color.

Several other plant pigments are involved in the process of photosynthesis, and with respect to isoxaflutole, carotenoids are an important group of accessory pigments. Carotenoids funnel additional light energy to the chlorophyll molecules and also help dissipate excess energy when the chlorophyll molecules are in the excited state

following absorption of light energy. If carotenoids are absent, chlorophyll molecules are unable to dissipate the excess energy, and damage to plant membranes can result. Chlorophyll molecules may also be damaged from this excess energy through a process known as photo-oxidation. If the chlorophyll molecules are damaged extensively enough, injured plants may lose their characteristic green color and appear white.

Balance inhibits a step in the carotenoid synthesis pathway, specifically the enzyme 4 HP dioxygenase (HPPD). Command (clomazone) also inhibits carotenoid synthesis, but acts at a different site of action than Balance. When carotenoid synthesis is inhibited, affected plants appear white, which is the primary injury symptom of Balance. This "bleaching" symptomology generally occurs first along the margins and tips of new leaves. Unlike Command, corn generally has good tolerance to Balance because the corn plant can rapidly metabolize the active ingredient to nonphytotoxic forms.

Why has corn injury from Balance appeared? Although we don't have definitive evidence or data to elucidate the cause, we suspect that cool, wet growing conditions may have contributed to the observed injury. The mechanism of isoxaflutole selectivity to corn is the ability of the corn plant to rapidly metabolize the active ingredient to a nonphytotoxic form. Factors such as cool weather and very wet soils, which slow overall plant growth, can also slow the plant's ability to rapidly metabolize the herbicide. If the amount of active herbicide within the plant exceeds the plant's ability to metabolize it, crop injury symptoms are frequently the result.

Field observations indicate that where Balance injury has occurred, symptoms are often very distinctive along the headland rows where there may have been a double-up of the application. Additionally, soils lower in organic matter and/or with a higher sand content may have more herbicide in solution and thus more available for plant uptake than soils with a higher organic matter content. (Pictures of Balance injury are currently available through the Web version of this newsletter.)

Will the corn plants recover from this injury? Again, we do not have sufficient data to offer anything more than recent field observations. Some recently visited fields where injury has been present for a week or longer have begun to show signs that the crop is recovering, whereas portions of other fields have already been replanted due to the severe injury. With additional precipitation, our hope is that Balance will not "recharge" the corn.—*Aaron Hager, Marshal McGlamery*

Postemergence Grass Control in Corn

There are several herbicide options for postemergence grass control in corn. Some require "modified" corn hybrids such as IMI (IR/IT), Liberty Link (LL), Poast Protected (PP), or Roundup Ready (RR). Other herbicide options do not require special corn hybrids and include products such as Accent, Accent Gold, Basis, Basis Gold, and even atrazine + crop oil. Accent or Beacon are very good choices for control of shattercane and johnsongrass.

Size of annual grasses for optimal postemergence herbicide efficacy varies by species and herbicide. A general rule of thumb for grass size is 2 inches for Basis, 3 inches for Accent Gold and Basis Gold, and 4 inches for Accent. Celebrity G, the grass herbicide portion of the Celebrity co-pack, contains the same active ingredient as Accent.

Tables 1 and 2 are reprinted from Chapter 2 of the *1999 Illinois Agricultural Pest Management Handbook.* Table 1 lists corn herbicide ratings for postemergence grass control, whereas Table 2 contains information on maximum grass size according to the labels of the various postemergence corn herbicides. Be sure to read the respective herbicide labels for additional information, such as spray additives to include and any application precautions/restrictions, such as if the product can be applied to corn previously treated with certain soil insecticides.—*Marshal McGlamery, Aaron Hager*

PLANT DISEASES

Seedling Blight Concerns

Now is the time to begin looking for soybean seedling blights. Seedling blights are caused by a number of soilborne fungi that infect the roots of soybean seedlings, causing a root rot that gives the aboveground portion of the plant a blighted appearance. Dave Feltes, IPM Educator at the Quad Cities Extension Center, reports seedling blights in area fields.

Although you can typically expect to see root rot diseases such as *Pythium* and *Phytopthora* in low, poorly drained areas, they are not always specifically limited to those areas, especially taking into consideration the wet weather conditions we have experienced thus far in the growing season. Both of these diseases have similar symptoms: brown, rotted roots with an absence of secondary roots. Also, both of these diseases typically kill the seedling. They are indistinguishable in the field and must be identified in a lab. This is important for future management options. While fungicide seed treatments are available that effectively control both of these diseases, only *Phytopthora* can be managed by the use of resistant varieties.

Other seedling root rots to look for now are *Fusarium* and *Rhizoctonia* root rot. These two fungi cause what is termed a "dry rot." Both can cause a reddish-brown canker, usually at the soil line, and a dry-type rot of the roots. Like the wet rots, the dry rots are virtually indistinguishable in the field. To further complicate the situation, these two fungi are often found together. Both *Fusarium* and

Table 1. Grass and nutsedge control ratings for postemergence corn herbicides.

Herbicide	*BYG*	*CBG*	*WCG*	*GFT*	*YFT*	*FLP*	*SBR*	*SHC*	*JHG*	*WSM*	*YNS*	*QGR*	*Corn*
Postemergence	*See Table 2 for maximum grass sizes*												
Accent[a] or Celebrity[a]	**8+**	5	**8+**	**8+**	**8+**	**8+**	**8**	**9**	**8+**	7	6	**8+**	1+
Accent Gold[a]	**8+**	6	7	**8+**	**8**	**8**	**8**	**8+**	7	6	5	7	2
Basis[a]	**8**	6	5	**8**	**8**	7+	6	**8**	4	5	4	4	2
Basis Gold[a]	**8+**	6	7	**8+**	**8**	**8**	**8**	**8+**	7	6	5	7	2
Beacon[a]	4	4	N	6	5	7+	6	**9**	7+	5	6	**8**	2
Lightning[b]	**8**	7+	**8+**	**8+**	**8**	**8**	7	**9**	7	N	6	5	1+
Resolve[b]	7	7	6	**8**	6	6	4	**8**	5	N	5	N	1+
Poast Plus[c]	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**8+**	7	7	N	7	0
Atrazine/Oil	7	5	6	7	7	4	6	N	N	5	7	6	1+
Liberty[d]	7	7+	**8+**	**8+**	7	7	7	**8**	6	7	6	5	1
Liberty[d] ATZ	7	6	**8**	**9**	7	6	7	7	5	6	6	6	1
Roundup[e]	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**8+**	7	**8+**	1
Permit	N	N	N	N	N	N	N	N	N	N	**9**	N	1
Laddok	N	N	N	N	N	N	N	N	N	N	**8**	N	1

Control Ratings: **9 = Excellent, 8 = Good,** 7 = Fair, 6 = Poor, 5 or 4 = Unsatisfactory, N = Nil or None.

Crop Response: 0 = Minimal, 1 = Possible, 2 = Probable, 3 = Serious.

BYG = barnyardgrass, CBG = crabgrass, WCG = woolly cupgrass, GFT = giant foxtail, YFT = yellow foxtail, FLP = fall panicum, SBR = field sandbur, SHC = shattercane, JHB = johnsongrass, WSM = wirestem muhly, YNS = yellow nutsedge, QGR = quackgrass.

[a] Use of IR (imidazilione-resistant) corn hybrids minimizes insecticide interaction and injury.
[b] Use only with IMI-designated corn hybrids.
[c] Use only with PP- or SR-designated corn hybrids.
[d] Use only with Liberty Link or GR (glufosinate resistant) designated corn hybrids.
[e] Use only with Roundup Ready–designated corn hybrids.

Table 2. Corn "post-grass" herbicides: Maximum grass sizes in inches.

		Annual grasses									*Perennials*		
		BYG	*VCC*	*CGR*	*WCG*	*GFT*	*YFT*	*FLP*	*SBR*	*SHC*	*JGR*	*WSM*	*QGR*
Herbicide	*Oz/A*	*Maximum size of grass (weed) in inches for given rate*											
Accent	2/3	4	-	-	4	4	4	4	3	12	18	-	10
Accent Gold	2.9	3	-	1	1*	3	3	3	2	6*	-	-	8*
Basis	1/3	2	-	-	<1*	2	2	2	-	4*	-	-	-
Basis Gold	14	3	-	1	1*	3	3	3	2	6*	-	-	8*
Celebrity G	2/3	4	-	-	4	4	4	4	3	12	18	-	10
Beacon	0.76	-	-	-	-	2*	2*	<2	4*	-	16	-	8
Liberty[a]-LL	20 fl	0	0	0	6	6	0	2	0	0	-	-	-
	28 fl	3	10[b]	3	10	10	3[c]	3	0	6	0	0	0
	34 fl	4	12[b]	4	12	11	4[c]	4	3	7	0[d]	0[d]	0[d]
Liberty[a] ATZ	32 fl	0	0	2	6	6	0	2	0	4	-	-	-
	40 fl	4	6[b]	4	10	10	4	4	3	8	0[d]	0[d]	0[d]
Lightning-IMI	1.28	3	12[b]	3	3	6	3	3	<1	8	8*	-	3
Poast Plus-PP	24–30[e]	8	20[b]	6	8	8	8	8	3[e]	18	-	-	-
	36_R fl	12	-	8	-	16	16	12	-	-	25[f]	6[f]	8[f]
Roundup-RR	24	6	20[b]	18	12	12	12	8	18	18	-	-	-
	32	12	-	-	-	20	20	12	-	-	12[f]	>8[f]	>5[f]

RR = Grass sizes are those on low volume technology (LVT) label. Sizes are 4 to 6 inches on Roundup Ready label.

BYG = barnyardgrass, VCC = volunteer corn, CGR = crabgrass, WCG = woolly cupgrass, GFT = giant foxtail, YFT = yellow foxtail, FLP = fall panicum, SBR = field sandbur, SHC = shattercane, JGR = johnsongrass, WSM = wirestem muhly, QGR = quackgrass.

– = not listed on the herbicide label.
0 or * = Suppression/partial control/reduced competition!

[a] Requires glufosinate resistant (Liberty Link or GR) hybrids.
[b] Volunteer corn that is not resistant to the herbicide.
[c] Yellow foxtail prior to tillering.
[d] Sequential application of 28 fl oz Liberty provides control?
[e] Rate required for sandbur control.
[f] Second application of 24 to 36 fl oz needed for control.
36_R = Rescue operations or rate for perennials.

Rhizoctonia seedling blight are less environmentally limited than *Pythium* and *Phytopthora*. In other words, you won't just find them in the wet spots in the field. Given optimal growing conditions, seedlings can recover fairly well from the dry rots. Fungicide seed treatments are an effective option for management. For more discussion of seedling root rot disease symptoms, see issue no. 7 (May 7, 1999) of the *Bulletin.—Suzanne Bissonnette*

Wheat Diseases

Reports of leaf blight on the wheat crop have been very minimal this season—that's the good news.

Symptoms of barley yellow dwarf virus (BYDV), however, are prominent in many fields. In a recent tour through Sangamon County with Matt Montgomery of the Sangamon/Menard Extension Unit, I noted that wheat was exhibiting characteristic symptoms of BYDV infection on the flag and flag-1 leaves. The leaves were bright red, fading to yellowish in appearance. This is characteristic of BYDV infection, but actual virus infection can be detected only through ELISA testing in the laboratory. The symptomatic wheat did not appear stunted, which typically indicates spring infection by the virus rather than fall infection. This is good news from a yield-loss perspective, but nevertheless, spring-infected wheat will also have reduced yields. BYDV is managed by the selection of tolerant varieties and planting after the Hessian fly–free date.

Conditions for scab (*Fusarium* head blight) infection have been fairly good, so you will want to watch for development of this disease now. The wheat is flowering throughout most of the state, and the rains have been very timely for sporulation and infection of the wheat flowers by the fungus.—*Suzanne Bissonnette*

Plant Clinic Fees Change

The fees for the University of Illinois Plant Clinic have changed this year. The fees are $12.50 for regular samples; $18.75 for samples involving soybean cyst nematode, pinewood nematode, and special virus testing; and $40 for corn nematode assays. If you have questions about sample submission, contact your local University of Illinois Extension unit for information and forms, or contact Nancy Pataky (patakyn@mail.aces.uiuc.edu), the director of the Plant Clinic, at (217) 333-0519.—*Suzanne Bissonnette*

CROP DEVELOPMENT

Corn Off to a Good Start

The 1999 growing season, unlike many in recent years, has been one in which corn planting and stand establishment have proceeded with relatively few problems. We have had very few calls about poor stands, and most of the corn has emerged very well. Stands in the Urbana area are outstanding, probably the best I've seen in the past 10 years.

Although most fields are in very good shape, there are reports that heavy rainfall after planting has caused some stand problems in several areas. Most of the damage is from flooding of low parts of the field, but soil crusting has been a problem as well. If it appears that replanting may be needed in fields where stands are poor, Table 3 can be used as a guideline for making replant decisions. This table gives *percentage of maximum yield* to be expected from incomplete stands, and from replanting for full stands later on.

To use this table, find the expected yield from the existing plant population and the original planting date. Then find the expected yield from a full stand if replanted on a certain date (fill in between lines if the date is between two dates listed). The difference between expected yield from replanting and that from the existing stand is the yield increase you can expect. If that more than covers the cost of replanting, then it should pay to replant. The table does not go beyond the end of May because the

Table 3. Percentage of maximum yield to be expected from incomplete stands.

	Plant population, thousands per acre					
Date	*10*	*15*	*20*	*25*	*30*	*35*
	% of maximum yield					
Apr. 10	62	76	86	92	94	93
Apr. 20	67	81	91	97	99	97
Apr. 30	68	82	92	98	100	98
May 9	65	79	89	95	97	96
May 19	59	73	83	89	91	89
May 29	49	63	73	79	81	79

research was not designed to do so, but from other data we would expect a full stand planted on June 4 to yield about 75 percent of maximum, and one planted on June 10 to yield about 65 percent of maximum. Low areas that have drowned out don't need much calculation; they should be replanted as soon as they are dry enough.

Hybrids for replanting need not be changed to ones of earlier maturity if replanting is done in May unless the original hybrids were unusually full-season for the area. Corn planted late generally tends to require fewer growing degree-days to maturity, but of course they usually yield less than when planted early. Even when planting in early June, switching to earlier-maturity hybrids may not increase yield, especially since early-maturity hybrids are often not very well adapted to the area in question.—*Emerson D. Nafziger*

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