



PEST MANAGEMENT & CROP DEVELOPMENT

BULLETIN

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University of Illinois Off-Campus Courses, Fall 2000

The Off-Campus Graduate Studies (OCGS) program offered through the Department of Crop Sciences enables students to continue their education at many locations in Illinois. Students who enroll in the program may choose to participate in courses primarily to advance their own professional development, or they may seek admission to the master's degree program in the Department of Crop Sciences. Students who complete three qualifying OCGS courses will receive a Professional Development Certificate. Overall, the program offers courses from many crop production and protection areas, such as plant breeding, insect pest management, plant physiology, herbicide mode of action, and crop growth and development. Participating sites in the OCGS program include Champaign, Vandalia, Springfield, Rock Island, Kewanee, Malta, and Joliet. Classes typically start very early in September, so registrations must be completed by August 10, 2000.

To gather some more detailed information about the OCGS program, please contact Dr. Fred E. Below, Program Coordinator, at (800)252-1360, extension 3-9745, or at his email address, f-below@uiuc.edu. In addition, Ms. Patricia Brandau, assistant to the OCGS program coordinator, may be reached at (800)252-1360, or by email, brandau@uiuc.edu. The OCGS program web page can be viewed at <http://www.cropsci.uiuc.edu/grad/options/off-campus.html>.

Off-campus courses that are offered this fall include the following:

CPSC 323, Principles of Plant Breeding (Joliet Junior College, Joliet). 4 undergraduate hours (\$572) or 1 graduate credit (\$636). Tuesdays, September 5–November 21, 2000. Instructor, Professor Robert J. Lambert.

CPSC 326, Weed Management in Agronomic Crops (Quad Cities Graduate Center, Rock Island). 3 undergraduate hours (\$429) or 3/4 graduate credit (\$477). Mondays, September 11–December 4, 2000. Instructor, Adjunct Associate Professor Kenneth D. Smiciklas.

CPSC 329, Fundamentals of Insect Pest Management (Kishwaukee College, Malta). 4 undergraduate hours (\$572) or 1 graduate credit (\$636). Wednesdays, August 30–November 1, 2000; two Saturday classes, dates to be decided. Instructors, Adjunct Assistant Professor Susan T. Ratcliffe, Professor Kevin L. Steffey, and Professor Michael E. Gray.

CPSC 330, Plant Physiology (Lincoln Land Junior College, Springfield). 3 undergraduate hours (\$429) or 3/4 graduate credit (\$477). Wednesdays, August 30–December 6, 2000. Instructor, Professor Donald P. Briskin.

CPSC 377, Diseases of Field Crops (M5 Turner Hall, University of Illinois, Champaign). 3 undergraduate hours (\$429) or 3/4 graduate credit (\$477). Mondays, August 28–December 11, 2000. Instructor, Professor Donald G. White.

CPSC 418, Crop Growth and Development (Okaw Valley Vocational Center, Vandalia). 1 graduate credit (\$636). Tuesdays, September 5–December 12, 2000. Instructor, Associate Professor Fred E. Below.

CPSC 426, *Herbicide Fate and Mode of Action in Plants* (Black Hawk College, East Campus, Kewanee). 1 graduate credit (\$636). Mondays, September 11–December 11, 2000. Instructor, Adjunct Assistant Professor David Pike.—*Mike Gray*

INSECTS

Reports of Extensive Corn Rootworm Larval Injury Common

On July 13, we will begin to evaluate our experimental plots for corn rootworm larval injury. On July 7, John Shaw, Illinois Natural History Survey, examined the root systems from five plants in one of our Urbana controls (untreated plot, no soil insecticide used) and found 8 corn rootworm pupae, 5 pre-pupae, 16 third-instar larvae, and 12 second-instar larvae. Because John was able to find so many second-instar larvae, we elected to wait at least one additional week before beginning our root-injury evaluations. John indicated that extensive lodging was evident in many of our corn rootworm plots. In addition, western corn rootworm adults are very numerous in many corn and soybean fields across east-central Illinois.

Pete Fandel, crop systems educator, Woodford County, observed significant corn rootworm injury in cornfields near Minonk (northeast Woodford County). Pete indicated that many corn plants had two to three nodes of roots destroyed by larvae. Because of the significant root injury, top-heavy plants, and moist soils, several acres in one field were “flat.” Many adult western corn rootworms were also observed in the damaged fields.

Reports such as Pete’s are becoming more common as we approach mid-July. A word of caution: don’t automatically assume that a lodged field has significant corn rootworm larval injury. Tall and top-heavy plants are prone to lodge in rain-soaked soils, especially during impressive thunderstorms accompanied by high winds.

I’ve observed many lodged fields over the years, and in certain instances I was convinced that corn rootworm larvae were responsible. However, a closer examination of the roots revealed very little, if any, root injury. So, don’t jump to any quick conclusion. Please take a look at Kevin’s article in last week’s *Bulletin* (issue no. 15) for a complete description regarding the assessment of root injury.

If significant root pruning is discovered, don’t panic. Many corn hybrids are able to regenerate roots from mid-July to mid-August, especially with the excellent soil moisture reserves we have in some areas of the state. Kevin and I are interested in your “rootworm reports” from around the state. Let us know what you’re finding.—*Mike Gray*

Grape Colaspis Adults Numerous in Soybean Fields

Soybean fields in many areas of Illinois continue to be “blessed” with bountiful densities of grape colaspis adults. We should not be surprised by these observations based on the extensive number of reports concerning grape colaspis larval injury earlier this summer. Silvia Rondon, a graduate student in the Department of Crop Sciences, continues to capture grape colaspis adults on Pherocon AM sticky traps in several crops, including oats, corn, soybeans, and alfalfa. Adults were most abundant in soybeans and alfalfa. Although Pherocon AM traps seem to work quite well in capturing grape colaspis adults, to date no economic threshold has been established for this insect pest. Keep in mind that, until recently, the grape colaspis was considered a secondary pest, not prone to cause economic losses in most years. As our readers know, this model has changed in recent years.

If you’re using Pherocon AM traps to monitor densities of western corn rootworm adults in your soybean fields, it may be a good idea to also keep track of the numbers of grape

colaspis adults that are caught. Although we can’t be certain that eggs will be laid in that soybean field, possibly setting the stage for root injury in rotated corn next spring, you will at least have some additional information to make a more informed management decision next spring. Grape colaspis adults on occasion can be confused with northern corn rootworm adults. Grape colaspis adults are tan and oval (1/6 inch in length) with wing covers that reveal tiny punctures. Northern corn rootworm adults are slightly larger (1/4 inch in length) and have smooth wing covers that are pale to dark green.—*Mike Gray*

Reports of White Grub Injury Still Trickling In

As odd as it seems, we are still receiving an occasional report of white grubs causing damage to crops. Recently we received a report of white grubs causing serious damage to soybeans in Scott County. The roots apparently showed signs of white grub feeding activity. I received specimens of the grubs and photographs of both the grubs and aboveground symptoms of injury from two separate sources. I examined the grubs under a microscope, and, although they appeared to be “true” white grubs (*Phyllophaga* species), something about them made them look a little different from the grubs we usually receive for identification. However, there are many species in the genus *Phyllophaga*, and identification to species usually is difficult.

Information about most *Phyllophaga* white grubs indicates that the grubs feed throughout the summer during their second year in the soil. Therefore, it’s not unusual to find grubs in field crops during the summer. However, the presence of white grubs in a field does not necessarily mean that the grubs are responsible for the injury. Our crops in many areas of the state have suffered several stresses this summer, not the least of which is “wet feet” after continuous, heavy rainfalls.

The excessive rain that has occurred in some areas has resulted in aboveground symptoms of injury that may resemble injury caused by other factors, including white grubs. So bring your diagnostic skills to bear whenever you visit fields that just don't look right. A mistake in diagnosis could result in unnecessary or misplaced concern.—*Kevin Steffey*

Flights for Second Generations of Corn Borers Are Under Way

Ron Hines, research agronomist at the University of Illinois Dixon Springs Ag Center and an ever-vigilant observer of corn borer activity, has reported the beginning of captures of both European and southwestern corn borer adults in his traps in Massac and Pope counties. The numbers of European corn borer adults Ron has captured were very low as of July 11. However, he reported captures of as many as 300 southwestern corn borer adults in one type of trap on July 11. His data suggest that folks in southern counties may be in for a real struggle with southwestern corn borers this year. On the other hand, European corn borers continue to be most noticeable by their relative absence. As the next few weeks unfold, we should get a better handle on the potential for infestations of the second generation of both of these pests.

The flight of the moths that will lay eggs for the second generation of southwestern corn borers this year seems to be a bit ahead of schedule. A comparison of moth captures this year with last year's moth captures in southern Illinois also indicates considerably larger numbers. So keep tabs on the moth flights, and be prepared to scout, and treat if necessary. Knowing what both egg masses and larvae look like will aid your scouting efforts.

Southwestern corn borer female moths may oviposit eggs singly or in small clutches of up to five eggs on either the upper or lower surface of a corn leaf. Females lay most of their eggs in the ear zone. The eggs are oval, flat-

tened, and cream colored when first deposited. When eggs are laid in masses, they overlap like fish scales, similar to the eggs of European corn borers. Within 48 hours after they are laid, three pink to red transverse bars become visible on southwestern corn borer eggs. Southwestern corn borer larvae have indistinct bands across their bodies from which very fine hairs (setae) project. Tubercles (small bumps) become very apparent on fourth and fifth instars.

Small larvae of the second generation usually can be found between or under the husk layers of the primary or secondary ears, on ear shoots, and behind leaf sheaths. When larvae reach the third instar, they bore into the stalk and begin tunneling. They also may tunnel inside ear shanks, and occasionally they can be found feeding on kernels in the ear.

Scouting for the second generation of southwestern corn borers should intensify for at least 2 weeks after pollination is complete and should continue throughout July. Look for egg masses and larvae on the leaves or behind leaf sheaths. A rescue treatment may be justified when 20% to 25% of the plants are infested with eggs or newly hatched larvae behind leaf sheaths. If the percentage of plants infested is not enough to justify treatment, scout again in 3 to 5 days, then consider treatment if the sum of the two counts is more than 25%. These simple guidelines are suggested only as starting points. Low commodity prices and the cost of the insecticide rescue treatment must be factored into the decision-making process. After larvae tunnel into stalk tissue, rescue treatments are not a control option. Insecticides that are labeled for use against the second generation of southwestern corn borer include *Ambush 2E (6.4 to 12.8 oz of product per acre), *Capture 2EC (2.1 to 6.4 oz of product per acre), Lorsban 4E (1 1/2 to 2 pt of product per acre), Lorsban 15G (6.5 lb of product per acre), *PennCap-M (2 to 4 pt of product per acre), *Pounce 1.5G (6.7 to 13.3 lb of product per

acre), *Pounce 3.2EC (4 to 8 oz of product per acre), and *Warrior T (2.56 to 3.84 oz of product per acre). Use of products preceded by an asterisk is restricted to certified applicators.—*Kevin Steffey and Mike Gray*

A Reminder About Several Insects in Corn Right Now

A note from John Irlle with Illini FS reminded me to offer a few comments about several different insects that might be found in cornfields right now. Although we typically focus on one insect per article in the *Bulletin*, we are fully aware that those of you who scout must look for a whole gang of insects that might present problems. In addition to the corn rootworms, grape colaspis, southwestern corn borers, and European corn borers discussed in previous articles, you may encounter any number of other insect pests that we have discussed at various times this season. John indicated that in virtually all fields he has scouted in Champaign and Douglas counties, he can find infestations (although none of them economic) of corn rootworm adults, Japanese beetles, grasshoppers, corn leaf aphids, and woollybear caterpillars. Corn rootworm adults, Japanese beetles, and woollybear caterpillars all clip silks, and grasshoppers and corn leaf aphids can also interfere with pollination and yield potential.

The saga of the Japanese beetle during the past couple of years has spread to many relatively new places in Illinois, and people are wondering if this pest is here to stay. Well, it certainly will be around for years to come; whether densities of Japanese beetles reach economic levels every year is another story. It's likely that mild winters, early planting, and possibly other factors have contributed to their success during 1999 and 2000. One more reminder: begin to watch in earnest for Japanese beetles in soybeans.

Although we have not mentioned woollybear caterpillars this year, their presence always bears watching. It is

not common for us to experience economic infestations of these pests, especially in corn. Although they clip silks, they usually move from ear to ear, so the silks continue to grow after being clipped off. However, their presence now suggests that we need to watch for them showing up in soybeans soon. Fortunately, wet weather promotes the spread of a fungal disease organism that regulates populations of woollybear caterpillars.

Keep the reports coming, regardless of what you find (or don't find). Our knowing that not much is happening in your area is just as important as our receiving reports of significant problems.—*Kevin Steffey*

Watch for Late-Season Insect Problems

At this point in the growing season, things are progressing well. Disease and insect problems have been isolated. There may still be some concerns as the season progresses. The first potential problem is grasshoppers. The moisture we received during the later part of June has kept the grass green and the grasshoppers out of our crops. As the temperatures rise and rainfall dwindles, look for these grasshoppers to move into green crops. Border treatments with carbaryl or malathion can reduce the movement of these insects into corn and beans. As with most insects, grasshoppers are easier to control when they are small, so scout those waterways and field borders soon before these insects move into your crops.

There is one other insect that has the potential of sneaking up on us later in the season. This insect is the southwestern corn borer. First flight activity peaked in the first week of June. Trap catches were quite high in Massac County and moderated as one moved north into Franklin County. Infestations of first-brood southwestern corn borer have been locally heavy but generally not much of a concern. The second flight has begun in southern Illinois, with high catches reported in

Massac and Franklin counties. These numbers reflect the potential for significant infestations of second-brood larvae. The peak egg-laying period should occur during the second and third weeks of July. Later plantings of corn could be severely affected by these second-brood larvae. Treatments for second-brood larvae may be warranted when 20% to 25% of the plants are infested with eggs or newly hatched larvae. The feeding activities of the southwestern corn borer can increase lodging and dropped ears during harvest. Early harvest of severely infested fields can reduce these harvest losses.—*Mark Hoard*

PLANT DISEASES

Phytophthora Rot on Soybean

Several reports of Phytophthora root rot on soybeans have been received from around the state. The Phytophthora organism can cause disease symptoms on soybeans at any stage of growth. Issue no. 2 of the *Bulletin* discussed damping-off, seed and seedling rot, and fungicide seed treatments for Phytophthora and other soilborne fungi. During the midsummer, the Phytophthora organism can cause a stem disease on soybeans. Midsummer symptoms resulting from infection by Phytophthora will vary with the susceptibility of the soybean cultivar. Plants can die throughout the growing season from infections that happened close to planting. Typical symptoms on older susceptible plants are yellowing between the veins and at leaf margins, along with chlorosis of upper leaves. The soybean plant often wilts soon after these symptoms occur. Leaves remain attached to the petiole after the plant dies. Lateral roots and taproots are often destroyed, and lesions girdling the stem can extend upward to the 10 node on the plant. Lesions on the stem are sometimes described as brown or chocolate brown. The important thing to remember is that infection from Phytophthora root rot starts in the soil, so stem lesions will begin at the soil line and

move upward. On more tolerant cultivars, this organism may rot roots and stunt plants, but plants are not killed. Stem lesions are long and narrow, brown in color, and sunken. Highly tolerant cultivars may appear as stunted and chlorotic plants showing rot of secondary roots and taproot discoloration. Symptoms can look like lack of nitrogen or damage from flooding. Often, damage from this pathogen appears after heavy rains, which have been prevalent in some areas of Illinois.—*Loretta Ortiz-Ribbing*

Update on Fungal Leaf Blights

Common rust is developing in most cornfields around the state. Eyespot is showing up on the upper leaves of corn plants in various areas around the state. Remember that what is important about all these leaf blights, including the rusts fungi, is not which blight you have but rather the percentage of leaf area blighted as a whole on the plant. Our recommendation is to scout the corn during the 2 weeks prior to tasseling through 2 weeks after tasseling. Control considerations may be justified when whole-plant infection reaches 15% for field corn and 10% for seed corn during this time. For control considerations and recommended fungicides, see issue nos. 14 and 15 of the *Bulletin*.—*Loretta Ortiz-Ribbing*

WEEDS

Considerations for Late-Season Soybean Herbicide Applications

With mid-July upon us, many areas of Illinois have completed their postemergence soybean herbicide applications. However, there are still applications being made to late-planted fields, double-crop soybeans, and fields needing a "cleanup" due to weed escapes. With a number of fields yet to be treated for the first time and some to be resprayed, there are a number of considerations when choosing a

postemergence herbicide for that final application.

Almost all postemergence soybean herbicides have a preharvest interval specified on their respective labels. Preharvest intervals indicate the amount of time that must elapse between herbicide application and crop harvest. These intervals are established to allow sufficient time for the herbicide to break down or metabolize in the plant. Failure to observe the

preharvest interval may result in herbicide residue levels in the crop in excess of established limits. In addition to preharvest intervals, there are also restrictions on many postemergence soybean herbicide labels regarding the use of the soybean crop for feed or grazed as forage. Table 1 contains information regarding preharvest intervals and grazing restrictions for a number of postemergence soybean herbicides.

Another interval that is important to observe is the rotational crop interval. Nearly all herbicide labels (soil-applied or postemergence) have rotational crop intervals that specify the amount of time that must elapse between herbicide application and planting a rotational crop. This becomes particularly important with late-season herbicide applications. These intervals are established to reduce the possibility that sufficient herbicide residues will persist in the soil that could adversely affect the rotational crop. Some herbicide rotational restrictions are based solely on time, while other factors, such as soil pH and the amount of precipitation received after herbicide application, influence the length of the crop rotational interval. For example, the Classic label indicates that field corn may be planted 9 months after application; however, the interval is extended 2 additional months if applications containing chlorimuron are made after August 1. Other examples include a 10-month rotational interval for field corn and a 4-month rotational interval for wheat following applications of Authority, Flexstar, and Reflex. Table 2 contains rotational crop intervals for soybean herbicides.—Christy Sprague and Aaron Hager

Table 1. Preharvest intervals and grazing restrictions for postemergence soybean herbicides.

<i>Herbicide</i>	<i>Preharvest interval (days)</i>	<i>Forage</i>
Postemergence grass only		
Assure II	80	No!
Fusilade DX	Prebloom	No!
Fusion	Prebloom	No!
Poast Plus	75	Hay
Select	60	No!
Postemergence broadleaf, contact		
Basagran	None	Yes
Blazer	50	No!
Cobra	45	No!
Flexstar	Prebloom	No!
Galaxy	50	No!
Reflex	Prebloom	No!
Resource	60	No!
Stellar	60	No!
Storm	50	No!
Postemergence broadleaf, systemic		
Classic	60	No!
FirstRate	65–50% flower	Yes /14 days
Pinnacle	60	No!
Pursuit	85	No!
Raptor	85	No!
Roundup Ultra ^{a,b}	7 / 14	Yes /PHI
Synchrony STS	60	No!
Touchdown 5 ^{a,b}	14 /56 spot /7 wick	No!
Harvest-aid use		
Gramoxone Extra	NA	Yes /15 days
Roundup Ultra	7	>25 days
Touchdown 5	7	No!

^a Use broadcast treatment only with Roundup Ready–designated soybeans.

^b May be used as a spot treatment.

CROP DEVELOPMENT

More on Corn and Temperature

Last week in the *Bulletin*, I mentioned that it would be better for corn if the temperatures during the next 2 months averaged a few degrees below normal. Someone this week mentioned the “conventional wisdom” that while the weather was warm and humid “at least it’s good weather for corn.” It might be time for a little thinking about temperatures as the corn crop enters the period of rapid grainfilling.

Although the belief that weather that’s uncomfortably warm and humid is good for corn probably makes us feel a little better when we’re having such weather, such conditions really are not ideal for corn growth and yield. In

Table 2. Soybean herbicide recropping restrictions, months.

Herbicide	Comments	Field corn	Sorghum	Wheat	Oats	Rye	Alfalfa	Clover	Soybeans
<i>Chlorimuron and some of its premixes</i>									
Canopy ^a	w/metribuzin	10	12	4	30	30	10	12	AT
Classic	high chlorimuron	9 ^b	9 ^b	3	3	3	12 ^b	12 ^b	AT
Synchrony STS	w/thifensulfuron	9 ^b	9 ^b	3	3	3	12 ^b	12 ^b	AT
<i>Flumetsulam and its premixes; cloransulam</i>									
Broadstrike + Dual	w/metolachlor	AT	12	4.5	4.5	4.5	4	26 ^{Fba}	AT
Broadstrike + Treflan	w/trifluralin	8	12	4	12	4	4	26 ^{Fba}	AT
FirstRate	cloransulam	9	9	3	30 ^{Fba}	30 ^{Fba}	9	30 ^{Fba}	AT
Python	flumetsulam	AT	12	4	4	4	4	26 ^{Fba}	AT
<i>Imazaquin and its premixes (full rate = Squadron; Region 3 = north of Peoria)</i>									
Scepter—Region 2 ^c	imazaquin	9.5 ^{de}	11 ^e	3 ^e	11 ^e	18	18	18	AT
Scepter—Region 3 ^c	0.5 rate, post	NY ^d	11	Fall ^e	NY ^e	18	18	18	AT
Scepter—Region 3 ^c	imazaquin	18	11	18	18	18	18	18	AT
Squadron—Region 2 ^c	w/pendimethalin	9.5 ^{de}	11 ^e	4 ^e	11 ^e	18	18	18	AT
<i>Imazethapyr and its premixes (full rate = Pursuit, Pursuit Plus; Steel = Pursuit Plus + 0.5X Scepter)</i>									
Pursuit	imazethapyr	8.5 ^f	18	4	18	4	4	40	AT
Pursuit Plus	w/pendimethalin	8.5	18	4	18	9.5	9.5	40	AT
Steel—Region 2 ^c	w/pendimethalin + imazaquin	9.5 ^{de}	18	4 ^e	18	40	18	40	AT
<i>Metribuzin and its premixes</i>									
Sencor	metribuzin	4	12	8	12	12	4	12	4
Turbo	w/metolachlor	8	12	4.5	12	12	12	12	AT
Axiom	w/flufenacet	AT	12	12	12	12	12	12	AT
Domain	w/flufenacet	1	12	12	12	12	12	12	AT
<i>Sulfentrazone alone or plus chlorimuron</i>									
Authority	sulfentrazone	10	10	4	4	4	12	18	AT
Canopy XL ^a	w/chlorimuron ^a	10	10	4	30	4	12	18	AT
<i>Other active ingredients</i>									
Command 3ME	clomazone	9	9	12	16 ^g	16 ^g	16 ^g	16 ^g	AT
Flexstar, Reflex	fomesafen	10	18	4	4	4	18	18	AT
Raptor	imazamox	9	9	3	9	4	9	18	AT

^{Fba} = field bioassay needed (see label); NY = next year; 2Y = second year; AT = anytime.

^aMidwest states' rate, soil pH < 6.8.

^bExtend 2 months if applied after August 1.

^cSee label for exact area and Region 3 (northern Illinois) full-use rate.

^d10- to 15-inch annual rainfall is required, or use CL-corn hybrids.

^e15 months if Scepter/Scepter O.T. sequence, but 9.5 months or NY for CL-corn hybrids.

^fClearfield (CL, formerly IT/IR)-designated corn hybrids may be replanted anytime.

^gCover crops may be planted anytime, but stand reductions may occur. Do not graze or harvest for forage for at least 9 months.

fact, weather that's comfortable for us—highs in the mid-80s and relatively low humidity—is also ideal for corn. Humidity by itself is not so much a direct factor in corn growth conditions, but indirectly it is important because it is associated with night temperatures. We usually associate humidity with how comfortable it is in the afternoon, but it's often more useful to consider the dewpoint, which is temperature at which the air is saturated. The dewpoint doesn't change with temperature and so is a more direct measure of the concentration of water vapor in the air.

Night temperatures usually fall to near the dewpoint in our climate, so high dewpoints mean higher night temperatures. High night temperatures are associated with higher respiration rates in the plant. Respiration uses up sugars formed in photosynthesis, leaving less available to fill grain. When the dewpoint is high, dew (which forms because leaf temperatures fall below the dewpoint at night) dries from the corn leaves more slowly in the morning as the air temperature rises. When the leaves stay wet longer, leaf diseases may develop more extensively. The effects of such dampness on insects is mixed, because some diseases of insects may be favored in some cases.

High dewpoints are associated with uncomfortable weather because night temperatures stay relatively high and sweat evaporation, which is our cooling mechanism, is slow when relative humidity is high. The “90° and 90% humidity” that people talk about is usually an exaggeration, though: relative humidity falls to 90% when the temperature is only about 3° or 4° above the dewpoint. Dewpoints in the 70s are quite uncomfortable, and dewpoints in the 80s are downright tropical. Afternoon relative humidity values in the 70s are uncomfortable on warm days, and they need to get below 50% (which happens when the temperature is about 20° above the dewpoint) before it starts to feel comfortable to humans.

As the temperature rises above the dewpoint in the morning, the relative humidity (the percentage of water vapor in the air relative to what it would contain if saturated at that temperature) drops. Because water vapor content in the air changes relatively slowly over time (except when weather fronts pass through), the greater the rise in temperature from the morning low to the afternoon high, the lower the afternoon relative humidity. Low relative humidity slightly increases the rate of transpiration (evaporation of water from inside the leaves), but wind speed usually affects transpiration rates more than relative humidity.

We often think of high rates of transpiration as negative because they result in more rapid loss of water from the soil. When water supply is adequate, as it is in most areas this year, rapid water loss from leaves means more evaporative cooling of leaves, and also more rapid uptake of carbon dioxide, that is, higher photosynthetic rates. Rapid water loss is also associated with bright sunlight, which also means higher rates of photosynthesis. So we would normally consider a day of relatively rapid water loss to be a good day for the corn crop.

The ideal scenario of night temperatures in the low 60s, high temperatures in the mid- to upper 80s, low relative humidity, and bright sunlight would translate into very rapid grainfilling rates for this year's corn crop. We normally consider that it takes about 55 days from pollination to physiological maturity, which would mean a grainfilling rate between three and four bushels per day. During the middle of this period, about a month after silking, filling rates probably approach five to six bushels per acre per day. Cloudiness and loss of leaf area to insects, diseases, or nutrient deficiencies reduces these rates and results in lower yields. It is important that every day's sunlight be used to the maximum extent possible by the crop, and we need to do what we can to assure that the canopy is full and

healthy right up to physiological maturity.—*Emerson Nafziger*

REGIONAL REPORTS

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

- North (Northwest and Northeast districts, plus Stark and Marshall counties)
- West central (West and West South-west districts, and Peoria, Woodford, Tazewell, Mason, Menard, and Logan counties from the Central district)
- East central (East and East South-east 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.

East-Central Illinois

Growers venturing into soggy cornfields are reporting unusually high amounts of leaf rust, large numbers of Japanese beetles that are clipping silks, light levels of western corn rootworm beetle activity, and surprising amounts of corn-borer damage. However, none of these was reported at an economic damage level. See the previous two issues of the *Bulletin* for information on foliar diseases in corn.

The major concern in soybeans this week has been defoliation from Japanese beetles.

Producers trying to make hay have been frustrated with the recent rainy conditions.

Northern Illinois

Rain, rain, rain came in a steady stream, with amounts this past week-end of 1 to 5 inches depending on where you live.

Diseases in corn are beginning to generate many questions concerning the application of fungicides for control. The problem is that it takes many bushels to pay for the treatment because of low prices, and some individuals may pull the trigger too soon and have to decide about a second application.

Some phytophthora is beginning to show up in soybeans.

Insect problems are still low. A sweep on July 11 in 12-inch tall alfalfa in plots in Stephenson County averaged 0.5 leafhoppers per sweep, well below treatment thresholds. Many beneficial insects were in the sweep net with the leafhoppers.

Some potassium deficiencies are showing up in corn rows along the edge and, in some cases, other areas of the field.

Tasseling/silking of the corn crop is well under way.

Many yellow spots are showing in cornfields and soybean fields because of the wet field conditions.

Southern Illinois

Despite rain over the last 2 to 3 weeks, wheat harvest and double-crop bean plantings are proceeding well. In many cases, wheat has yielded better than expected. Corn is looking good throughout the area, with conventional corn a bit ahead of no-till. Some isolated pockets of southwestern and European corn borer infestation exist. European corn borer trap catches across the region are very low, but

southwestern numbers are building as the second flight begins. Late-planted corn could be severely affected by southwestern corn borer. Beans look good, some disease pressure exists, and insect problems are limited.

Grasshopper numbers are still high, but moisture and green grass have limited feeding on crops. There are some isolated reports of potato leafhopper damage in alfalfa.

West-Central Illinois

Rain continues to fall in most areas in the region, and all thoughts of a drought have ended.

Corn looks excellent, and fertilization in many fields is almost complete. The two problems observed in some fields are common rust and rootworm beetles, neither of which is a major problem. With warm, moist weather conditions, gray leaf spot may be a potential problem.

Soybeans are growing rapidly, and many fields are well into the reproductive stages. Water-damaged areas are prevalent in some fields, and SCN and SDS are the next potential problems.

Wheat yields were excellent, up to 90 bushels per acre in some areas.

Alfalfa harvest has been difficult due to wet conditions. Potato leafhopper numbers are increasing rapidly with the warm temperatures.

Farmers and agri-dealers have reported very few problems during the last week.

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