July 10: Agronomy Day at the Northern Illinois Agronomy Research Center

The Northern Illinois Agronomy Research Center will host its summer Agronomy Day on Tuesday, July 10. Join University of Illinois Extension specialists and researchers as they address issues pertinent to the current growing season. The program starts at 9:30 a.m. and finishes with a meal at 12:30. The event is open at no charge to all who wish to attend.

Weather permitting, presentations will take place in the research plots. These topics will be addressed:

- What does it take to produce high soybean yields? — Emerson Nafziger
- Update on corn rootworm issues and Bt performance — Mike Gray
- Corn disease identification and management — Carl Bradley
- Nutrient removal by corn and soybean — Fabián Fernández
- 2012 weed control challenges — Doug Maxwell

The 160-acre Northern Illinois Agronomy Research Center, located north of Shabbona, has been conducting crop research since 1948. The northernmost research center of the U of I Department of Crop Sciences, it is dedicated primarily to corn and soybean studies. More than 45 research and demonstration projects are conducted at the center every year. Visitors are always welcome.

The research center is located at 14509 University Road, about 5 miles north of U.S. Route 30 on University Road, which runs just east of Shabbona and a quarter-mile south of Perry Road.

For more information, contact Russ Higgins (815-274-1343; rahiggin@illinois.edu).

July 24 Field Tour to Address Management of Herbicide-Resistant Weeds

The public is invited to join members of the University of Illinois weed science program and our industry partners for an on-farm tour in Douglas County on Tuesday, July 24. We will view field research plots and discuss strategies for managing herbicide-resistant weed populations. Weed scientists from the University of Illinois, Southern Illinois University, and the University of Tennessee will address these topics:
How herbicide-resistant Palmer amaranth has changed farming practices in the mid-south, and why herbicide-resistant waterhemp could potentially do the same in the Midwest—Dr. Larry Steckel (University of Tennessee)

Selecting spray additives and application techniques to improve control of herbicide-resistant weeds with alternative herbicide chemistries—Dr. Bryan Young (Southern Illinois University)

The evolution of herbicide resistance in Illinois and implications for the future—Dr. Patrick Tranel (University of Illinois)

Management techniques for waterhemp populations with resistance to multiple herbicides—Dr. Aaron Hager (University of Illinois)

Bus transportation will be available at 7:30 a.m. and 9:30 a.m. from the southwest parking lot of the University of Illinois Assembly Hall (where participants will leave their vehicles) to the Douglas County field, at the intersection of county roads 1450N and 850E.

At the field, participants will rotate among the four 20-minute presentations. After the field tour, attenders will be transported to the Bayer CropScience research station in rural White Heath for a complimentary lunch and additional presentations on topics related to herbicide-resistant weeds. After lunch, buses will return to the Assembly Hall parking lot, where Dr. Bob Wolf, retired extension agricultural engineer, and Dr. Scott Brethauer, University of Illinois extension specialist, will present a 90-minute “On-Target Application Academy” describing the latest techniques and technologies to improve herbicide deposition and reduce the potential for off-target movement.

This educational offering is a collaboration between the U of I weed science program and our industry partners at Bayer CropScience, Valent, and BASF. If you would like to attend, please register at events.SignUp4.com/RespecttheRotation2012.—Aaron Hager

Insects

Whitefly Infestations Reported in Some Northern Illinois Soybean Fields

Some soybean fields in northern Illinois are currently infested with whiteflies, a pest with a complicated taxonomy. A 2011 Annual Review of Entomology article indicated that “B. tabaci is a complex of 11 well-defined high-level groups containing at least 24 morphologically indistinguishable species” (DeBarro et al., “Bemisia tabaci: A Statement of Species Status,” Vol. 56, pp. 1–19). The common names used most often include sweetpotato or silverleaf whitefly.

I anticipate that if hot and dry conditions persist, whitefly infestations will intensify, along with twospotted spider mite challenges in the same fields. Historically, whiteflies have caused more problems in soybean fields in southeastern areas of the United States. In 1988, whiteflies were reported in soybean fields in northern Florida. Since then, infestations have been more common in southeastern soybean fields. In most seasons, whiteflies are far less common in north-central states, but in hot and dry summers, reports begin to surface in the Corn Belt. The host range for whiteflies is impressive, with over 500 species reported for the sweetpotato whitefly.

Whiteflies pass through four nymphal stages following hatch from eggs and then molt into adults. Adults and nymphs have piercing and sucking mouthparts and remove fluids directly from plant tissue, which occurs primarily from the lower surface of leaves. Leaves may become discolored and begin to wilt. Stunting of plants also may occur where infestations are heavy. In addition to removing plant fluids, whiteflies inject saliva and phytotoxic enzymes into plants. Similar to aphids, whiteflies produce honeydew, which can collect on the surface of leaves, stems, and pods and subsequently develop a sooty mold. Leaves covered with sooty mold have reduced photosynthetic efficiency, contributing to significant yield losses.

Development of whiteflies occurs between 57 and 97 °F with an average generation time of 22 days (range 18 to 30 days). Management decisions for whiteflies will be complicated by the fact that most fields are likely to have spider mites along with some Japanese beetles. The prolonged hot and dry weather also will intensify infestations and make soybean plants more susceptible to yield loss. Under the very hot temperatures forecast for the next week, pyrethroid effectiveness and residual activity will not be enhanced. Let’s hope the state begins to receive some rain soon.—Mike Gray

Crop Development

Short Corn, Short Yields?

The Illinois corn crop condition continues to deteriorate, with less than 40% now rated as good to excellent on June 24. This is almost entirely due to low rainfall—84% of the state’s topsoil is rated as having low or very low soil moisture. As the crop enters the critical yield-producing stage, many are wondering what effect the lack of soil water has had until now, and what effect it will have over the next weeks.

Rainfall amounts since May 1 have ranged from some 6 inches in parts of north-central Illinois to less than an inch in parts of southern and southeastern Illinois (Figure 1). Deficits from normal for this period range from an inch or two to more than 6 inches; they are in the range of 4 inches, or about half of normal, in much of the central part of the state (Figure 2). As of June 27, the U.S. Drought Monitor showed most
of Illinois in “moderate” or “severe” drought, with the southernmost counties in “extreme” drought (Figure 3).

As of June 24, 17% of the state’s corn crop was pollinating—the highest percentage for this date on record. This week we would expect most of the crop that was planted by mid-April in central and southern Illinois to begin to pollinate, bringing the number by July 1 to perhaps 40% or so.

While the pollination period is considered the most critical in terms of yield potential, breeding for aggressive emergence of ear shoots and silks has considerably lessened the likelihood of complete failure of pollination. Still, the number of kernels set may be lowered on plants that have been undergoing stress from dry soils, and the number of fertilized kernels that survive the weeks after pollination may continue to decline as the weather stays dry.

A common observation is that corn is entering or approaching pollination while plants are shorter than normal. This raises questions about the connection between plant height and yield. As I’ve observed before, plant height is the best visible indicator of how well the plant has been able to take up the water it needs to expand cells up to now. Cell expansion is sensitive to water supply, and so shortened internodes are one of the first things we notice on plants that have struggled to take up enough water to keep growing.

In some of the driest areas this year, plants have remained extremely short, and there are reports that some of these fields have tried to pollinate at heights of only a few feet. Most such fields will produce low yields, and some may produce none at all. More commonly, plants are 5 to 6 feet tall at the time tassels appear. Plants typically add some height after tasseling and reach full height by the end of pollination.

Having plants end up shorter than normal after pollination is not by itself a guarantee of lowered yields. But it is difficult for short plants to form the complete canopies that plants need for maximum yield. In part this is because plants that have had trouble getting enough water to elongate stalks may also have leaves that are smaller than normal. Even if leaf area is normal, short plants with leaves stacked closer together on the stalk means less interaction among neighboring plants and less flexibility of leaf movement, and so reduced ability of plants to form the complete canopy needed to intercept nearly all of the sunlight. Coupled with ongoing water stress that limits photosynthetic rates, such fields are likely to yield less than normal.

Positives with the current corn crop continue to be the good color, lack of diseases, and uniform stands, with few or no drowned-out areas. These factors will help increase kernel set in fields pollinating now, at least where there
is enough soil water at present. Cooler weather this past week has helped to prolong the period of adequate water, and cooler nights reduce respiration some, thus helping the sugar supply. The only negative, which is potentially large enough to cancel out all of these positives, is the lack of rainfall—and the forecast that this may continue for more days and weeks to come. The 2012 corn crop is well rooted, healthy, and tough, but it’s unrealistic to expect that it keep thriving as the soil water supply continues to decline in dry areas.

Is there anything we can do to help the crop get through this dry period? Not much. Some have suggested that applying fungicides can help reduce respiration and increase the plant’s sugar supply, thus providing a return even if there are no diseases to control. Strobiluron fungicides do act by reducing respiration, a small percentage of which is considered “wasteful.” But plants that are not photosynthesizing very well don’t have much sugar to respire away, so a reduction in respiration probably won’t do much good. By the same token, applying products said to reduce the “ethylene effects” in stressed plants is unlikely to have a positive effect when there’s not enough water to keep open the stomata, the holes in the leaves that open to admit the carbon dioxide converted to sugars during photosynthesis.

Protecting the crop from anything that reduces effective leaf area can help retain the potential to fill grain should we get rainfall later. This might include insecticides if enough insects are present to do damage. Fungal diseases that would respond to fungicides are not much of a threat in most fields today, and even if rainfall returns to normal, the rapidly developing crop may not develop fungal diseases fast enough to pose limitations late in the season. Foliar nutrients are unlikely to be of much benefit under dry conditions, especially when the good canopy color in most fields indicates adequate nutrient levels.

While the focus has been on corn, soybean plants are also showing stress effects in many areas. As with corn, the best indicators of how much stress soybeans have been under are plant height and leaf size. Our earliest-planted soybeans here were planted around April 20 and are about 24 inches tall and at stage R2, or full flower. With fair to good growth and warm temperatures, soybeans are moving quickly into flowering, with 11% blooming by June 24, only four days after the longest day of the year. Under conditions like those we have this year, day length is less important than growth stage and night temperatures in determining when soybean plants flower.

An early start to soybean flowering is generally positive, but concern remains about how water shortages might affect pod formation. The period over which new flowers appear will last for up to a month as the soybean plants continue to increase node numbers and stem height, and flowering can even recur if stress is relieved after that. This longer flowering period makes the soybean crop better able to set pods and start filling seeds even if there is some stress during July, but if conditions continue with little or no rainfall, abortion of flowers or of pods will likely continue. As is the case with corn, applying various materials promoted to “reduce stress” in soybean is not likely to do much good as long as water supply remains the critical limitation to continued growth and yield.—Emerson Nafziger

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