



# PEST MANAGEMENT & CROP DEVELOPMENT

## BULLETIN

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### Also in This Issue

- **Soybean Aphids Reach Economic Levels in Some Illinois Soybean Fields, Most Notably in Southern Counties, 154**
- **Preharvest Herbicide Applications, 154**
- **Fungal Ear and Stalk Rots, 155**
- **Can This “Turtle” 2009 Corn Crop Get to the Finish Line? 156**
- **Time and Heat Still Required for Soybean Yield, 157**
- **Phosphorus and Potassium Applications for the 2010 Crop, 158**

### AG Masters Conference—Mark Your Calendars for December 1 and 2

On December 1 and 2, the first AG Masters Conference will be conducted at the University of Illinois I Conference Center on St. Mary’s Road, just across the street from Assembly Hall. By design, this conference will be a significant departure from the Crop Protection Technology Conference (aka Agricultural Pesticides Conference, Custom Spray Operators’ Training School). The program will consist of two distinct parts, each with its own registration. The first day (Tuesday) will provide many speakers in a large general session atmosphere, including these:

- *Raising the Yield Bar: Can We Get Corn to 300 Bushels?*—Emerson Nafziger, University of Illinois
- *Corn Hybrid Development for the Future: Breeding, Biotech Traits and Agronomic Systems*—Dale Sorenson, Monsanto
- *Making and Taking of Soybean Yield*—Bill Wiebold, University of Missouri
- *The Genetic Contribution to Higher Soybean Yield*—Randy Nelson, University of Illinois
- *Glyphosate Resistance: Transitioning from Forecasts of Doom to Management of Actual Problems*—Mark Loux, Ohio State University
- *Stacks, Refuges and Volunteer Corn: Re-Shuffling the Deck on Corn Rootworm*—Ken Ostlie, University of Minnesota
- *Interpreting On-Farm Foliar Fungicide Data: Statistical Considerations and Wisconsin Perspective*—Paul Esker, University of Wisconsin
- *Supply/Demand Factors in the Global Fertilizer Market*—Harry Vroomen, The Fertilizer Institute
- *Environmental Issues, Nitrogen, and Climate Change*—Cliff Snyder, International Plant Nutrition Institute
- *The 2009 Growing Season in Review: Expectations for 2010*—Panel of University of Illinois Extension specialists

Following the presentations, several mixers will be available for attendees to discuss the day 1 information with friends and colleagues. This will provide a great opportunity to interact with the speakers and get any unresolved questions answered. The advance registration fee for the December 1 session is \$135, which includes lunch, refreshments, and a program proceedings. The fee for registering on-site will be \$175.

The program on December 2 will feature eight different 2-hour advanced sessions, with participants able to sign up for four of these classroom-style intensive instruction options. Registration for day 2 will be strictly **first-come, first-served, with enrollment limited to 120**. Topics and presenters on day 2 include the following:

- *Nitrogen Use by Corn: How Much, When, Where, and Why*—Fred Below, University of Illinois
- *Applied Statistics, Experimental Design and Analysis*—Gérman Bollero, University of Illinois
- *Applications of Biotechnology and Genomics to Enhance Plant Breeding and Crop Improvement*—Stephen Moose, University of Illinois
- *Soybean Cyst Nematodes, Biology and Management*—Terry Niblack, University of Illinois
- *Understanding the Physiology of Herbicide-Plant Interactions*—Dean Riechers, University of Illinois
- *The Challenges We Face Managing Glyphosate-Resistant Weeds*—Dale Shaner, USDA ARS, Colorado State University
- *Bt Plants for Insect Management: A Good Long-Term IPM Strategy or a Recipe for Disaster?*—Tony Shelton, Cornell University

• *Making Sense of Product Claims*—Paul Vincelli, University of Kentucky

The advanced sessions on day 2 (Wednesday) will be just that—advanced. Each session will last 2 hours in a classroom setting. Instructors will present challenging information—be ready to review and interpret the latest data concerning these hot topics! Enrollment will be limited to 30 per class. Again, a policy of first-come, first-served will be upheld. Each advanced session will be offered twice. A registration fee of \$235 will be charged for the second day. If you register for both days, the total advance registration fee will be \$350.

We will start accepting online registrations by mid-September. Before that begins, I will send an electronic alert to readers of *the Bulletin* who are registered to receive e-mail notification of new issues. The co-chairs of the AG Masters Conference (Carl Bradley, Vince Davis, Aaron Hager, Sandy Osterbur, and myself) are excited about this new event and believe it will offer unique features for all participants. We look forward to support and participation from the readers of *the Bulletin*.—Mike Gray

## INSECTS

### Soybean Aphids Reach Economic Levels in Some Illinois Soybean Fields, Most Notably in Southern Counties

After a relatively quiet summer with soybean aphids across Illinois and much of the north-central region, soybean aphid densities have begun to increase significantly in some fields. Jim Morrison, crop systems extension educator, Rockford Extension Center, indicated that in a sentinel plot in Lee County, 13 of 20 plants examined had 250 to 500 aphids per plant. Both soybean varieties were at the R6 stage of plant development (full seed). Jim also noted the presence of lady beetle adults and larvae in the plot.

In contrast to previous years, this season reports of soybean aphids are more numerous in southern Illinois. Robert Bellm, crop systems extension educator, Edwardsville Extension Center, has observed numerous soybean fields heavily infested with soybean aphids in the past week in Madison County near St. Jacob. Soybean fields with the worst infestations were those planted late or double-cropped.

Because of the late planting in many areas of southern Illinois, some fields have not reached R6. If fields are less mature than R6, they may still benefit from a rescue treatment if an average of 250 aphids per plant is found, 80% of plants are infested, aphid numbers are increasing, and few predators are observed. Keep in mind that actual yield loss does not typically occur unless aphid densities reach 675 aphids per plant. This is the economic injury level. Yield benefits of an insecticide treatment for soybean aphids beyond the R5 stage of plant development have proven inconsistent. Fields should continue to be scouted very thoroughly over the next several weeks and the appropriate management decision made on a field-by-field basis.—Mike Gray

## WEEDS

### Preharvest Herbicide Applications

Despite efforts to keep fields devoid of weeds, there are nearly always instances in which weeds somehow avert management practices and remain in fields as crop harvest draws closer. These weeds can cause problems during harvest operations and potentially return weed seed back to the soil seedbank. For these reasons, farmers sometimes consider making a preharvest herbicide application.

The list of herbicide active ingredients available for preharvest applications in corn or soybean is relatively short. In corn, glyphosate, paraquat and some formulations of 2,4-D or premixes containing 2,4-D may be applied to suppress/control weeds before harvest, while in soybean,

glyphosate, paraquat, dicamba (Clarity), and carfentrazone are labeled for preharvest applications. Be sure to consult the respective product label for specific application information. For example, not all formulations of 2,4-D are labeled for preharvest applications in corn, and specific application intervals, rates, and restrictions can vary by product. (See Table 1 for a summary of general guidelines.)

Preharvest herbicide applications should be made soon enough before harvest to allow sufficient time to dry down treated weeds. Dry-down of weed vegetation may be slowed during periods of cool and wet weather. All products labeled for these applications specify a period that must elapse between application and harvest, but additional time may be needed to dry down large weeds. Contact herbicides usually provide faster weed dry-down than translocated herbicides. Application practices that increase spray coverage of the target vegetation can improve control.

While preharvest herbicides are unlikely to *prevent* weed seed production, previous research has demonstrated that herbicides can impact seed production or viability; however, the effects often depend on several factors, including the herbicide used, weed species, and application timing in relation to the stage of weed seed development. For example, researchers Clay and Griffin (*Weed Science* 48:481–486) investigated cocklebur seed production as influenced by glyphosate application timing. Their results showed that cocklebur seed production was significantly reduced when glyphosate was applied at the earliest timing (initial seed set), but little impact occurred when application was delayed until the latest timing (physiological maturity). Given the current developmental stage of weeds in Illinois, preharvest herbicides may not do much to limit weed seed production.

Also, be very cautious not to apply preharvest herbicide before the crop development stage indicated on the

**Table 1. General guidelines for preharvest herbicide applications in corn or soybean.**

Product	Crop	Timing	Restrictions	Comments
2,4-D	Corn	After hard dough or dent.	Allow at least 7 days before harvest.	Be sure to consult respective product label.
Rage D-Tech	Corn	Apply after hard dough stage.	Allow at least 3 days before harvest.	For use in field corn only.
Glyphosate <sup>a</sup>	Corn	35% grain moisture or less, physiologically mature.	Allow at least 7 days before harvest.	Not recommended for non-glyphosate-resistant corn grown for seed.
	Soybean	After pods have lost all green color.	Allow at least 14 days before harvest. <sup>b</sup>	Not recommended for non-glyphosate-resistant soybean grown for seed.
Gramoxone Inteon	Corn	Apply after black layer.	Allow at least 7 days before harvest.	Make only one application.
	Soybean	Apply when at least 65% of seed pods are a mature brown color or seed moisture is 35% or less.	Allow at least 15 days before harvest.	Do not graze or harvest for forage or hay.
Clarity	Soybean	Apply after soybean pods have reached a mature brown color and at least 75% leaf drop has occurred.	Allow at least 14 days before harvest.	Do not feed soybean fodder or hay.
Aim EW	Soybean	Apply when crop is mature and grain has begun to dry down.	Allow at least 3 days before harvest.	Can help defoliate or desiccate velvetleaf, morningglory or pigweed.

<sup>a</sup>Information taken from the Roundup WeatherMax label.

<sup>b</sup>Allow 7 days between application and harvest of non-glyphosate-resistant soybean varieties.

product label. Such application may reduce crop seed production or viability.

While preharvest herbicide applications can provide some benefits, it might be helpful to temper your expectations. Large/mature weeds are more difficult to control than small/immature weeds. Crop yield loss caused by weed interference has already occurred by the time preharvest applications are made, and such losses are not “restored” even if the application successfully dries down all weed vegetation. Finally, be very cautious about physical and/or vapor drift from preharvest herbicide applications. —  
*Aaron Hager*

## PLANT DISEASES

### Fungal Ear and Stalk Rot

Given the recent weather, it is essential to be wary about *Diplodia* and *Fusarium* ear and stalk rots. We’ve had a lot of moisture, and unfortunately some of our ear and stalk rot fungi find that situation invigorating. Although the season should be winding down, late planting has led to later-maturing fields again this year. This has many producers worried about ear and stalk

rots and even seed germinating on the cob. *Diplodia* ear rot and *Fusarium* ear rot are our most typical ear rots in a nondrought year. Interestingly, both *Diplodia* and *Fusarium* also can cause stalk rots.

*Fusarium* ear rot, normally the most common ear rot found in Illinois and the Midwest, is characterized by pinkish to salmon-colored fungal tissue growing on the kernels. The fungus can be scattered on the cob or, often, seen toward the middle of the ear. The color is distinctive. *Fusarium* ear rot produces mycotoxins called fumonisins. *Fusarium* is favored by hot and dry conditions at pollination and high humidity. So while it is a disease endemic to our area, weather conditions were not exceptionally conducive to its development this year.

*Diplodia* ear rot, on the other hand, has had an optimal season for development. *Diplodia* ear rot is first noticeable in the field by a bleached appearance of the husk. When you peel back the husk, you see a white, fluffy fungus. The good news is that the *Diplodia* fungus will not produce toxins in the grain; the bad news is that kernels will be very lightweight, shriveled, and

of very poor quality. *Diplodia* is starting to be observed and will likely be our most common ear rot this season.

What is the right moisture at which to harvest corn that has had fungal ear rot problems? The answer really depends on several important issues. First, what ear rot do you have in the field? Second, what weather is expected? Ear rot fungi will continue to develop in the field or in storage at moisture above 18%. If dry weather is expected, you can try to save some drying costs and leave the grain to dry a bit longer in the field. If you have moderate infection, though, and wet weather is expected, harvesting and drying to at least 18% is probably your best option.

Do you really have to dry to 18% moisture? Well, that depends on what you are planning to do with the grain. If you are planning on long-term storage, you actually should get the moisture down below 15% to 16%. *Diplodia* is not your biggest worry for storage, but the many species of another of our ear rots, *Aspergillus*, produce very serious grain toxins, including aflatoxin, and are a concern as they like to grow from about 14% to 18% moisture.

Diplodia, Fusarium, and many other fungi also cause stalk rots in our area. They produce symptoms such as white, black, and pink stalk discoloration, but their main impact is decreased standability of the stalk.

Scouting for stalk rots is a fairly easy endeavor. Evaluate 20 plants at each of five locations in a field. Use the common zigzag scouting pattern to accurately evaluate stalk rot incidence. Begin scouting when kernels are at 30% to 40% moisture. You can use either of two methods to evaluate stalk integrity. The first is to lightly grasp the stalk at waist level and push it about 15 degrees from the vertical. A second method is to pinch the base of the stalk below the first node. Stalks that lodge or collapse when pinched should be marked positive for stalk rot. Fields can endure stalk rot incidence up to 10%. However, incidence above 10% to 15% calls for an early harvest to prevent further damage and lodging. You can investigate ears for ear rot just by peeling back the husk at the same time you are scouting for stalk rots.—*Suzanne Bissonnette*

## CROP DEVELOPMENT

### Can This “Turtle” 2009 Corn Crop Get to the Finish Line?

I’ve learned that making predictions in novel crop situations is a very inexact “science.” The 2009 Illinois corn crop definitely fits into the “novel” category, and we need to keep “inexact” in the forefront as well. The Ag Statistics Service report indicates that, as of August 30, the Illinois corn crop is only 78% in dough stage and 26% dent stage. This compares to 90% dough and 26% dent in 2008 (the most recent year with planting delays) and a 5-year average of 96% dough and 73% dent. A quick look at the records shows that these percentages in 2009 are lower than in any of the previous 25 years.

The fact that rainfall has been plentiful in most areas and that temperatures have been average or below has meant that the crop canopy has generally stayed in good condition in most

fields. Exceptions include fields where N loss has occurred, leading to loss of leaf color, firing, and premature loss of photosynthetic capacity. This is especially notable in low-lying areas, but some whole fields seem to be deficient as well. In most cases, if N management was done well, we need to view the excessive loss conditions in 2009 as unusual and to not make many large changes in rate, form, or timing. This is the second unusually high N loss year in a row, however, and while we don’t expect such conditions to occur next year, some may want to consider ways to manage N to reduce loss potential.

The NASS August 1 yield estimate of 175 bushels per acre for Illinois was based mostly on kernel counts. The extent to which kernels will fill is always a guess, especially when counts are made so early. Still, the estimate indicates that there are enough kernels developing to produce good yields. As usual, this is not the case in every field; in 2009, more than 20% of the crop was not yet pollinated by August 1, and while the weather remained cooperative, the August 1 yield estimate was made before kernels could be counted in these fields.

But the real story of 2009 has been the delayed planting and the slow rate of growing degree-day accumulation that has resulted in the crop’s entering September needing, in many fields, more GDD than average September temperatures may provide. How far behind are we? The GDD accumulated since May 1 range from about 90 below normal in southern Illinois to 200 below normal in central Illinois to nearly 300 below normal in the northern part of the state. May and June temperatures were about normal, so these deficits resulted from below-normal temperatures in July and August. Losing 125 to 150 GDD in each month is the result of temperatures averaging 4 to 5 degrees below normal.

Most hybrids we grow in Illinois require 2,500 to 2,800 GDD to reach maturity. Adding the average GDD accumulations that we can expect from

September 1 (based on average temperatures) to the 50% chance of first frost date (Table 2) to the GDD since May 1 gives total GDD accumulations ranging from about 2,600 in northern Illinois to some 3,700 GDD in southern Illinois. With the exception of northern Illinois, GDD accumulations should allow the early-planted crop to reach maturity well before frost. It will be close in northern Illinois, but most hybrids that were planted early should get close to maturity before frost, in which case yields won’t suffer much.

The problem, of course, is that so much of the crop was planted after May 1. I believe the reduced GDD requirement that we usually apply to late-planted corn (6 or 7 GDD less for each day planting is delayed past May 1) may not apply this year, given the cool temperatures over most of the summer. That observation is supported by the fact that development stages of later-planted corn seem to be tracking predicted development for early-planted corn. Corn planted on June 1 in northern Illinois can be expected to accumulate only about 2,300 GDD by frost, while the crop planted at that time in central Illinois will accumulate about 2,600 GDD. These numbers are less than most hybrids will need, especially in northern Illinois. In the southern regions, GDD accumulation should be enough to mature most hybrids that were planted in early June.

Even when corn gets frosted within 100 to 200 GDD before black layer, some sugars will still migrate from the stalk to the ear, so yield losses are often small. This means that even later-planted corn, other than late-maturing hybrids planted very late, should have a good chance to get close to its yield potential, even in northern Illinois.

Planting delays to mid- or late June (much of this crop was yet to pollinate on August 1) were most common in south-central Illinois. If we subtract about 150 GDD for each week after June 1 that planting occurred, the crop planted on June 15 in south-central Illinois should still accumulate about 2,600 GDD by frost. In years with

**Table 2. Approximate growing degree-day accumulation since May 1 and June 1 in different Illinois regions in 2009, and expected GDD accumulation from September 1 to first frost.**

Illinois region	GDD, May 1 to Aug 30	GDD, June 1 to Aug 30	Avg GDD, Sep 1 to first frost
North	2,000	1,700	600
Central	2,300	1,900	700
South-central	2,500	2,100	800
South	2,800	2,300	900

Source: Midwest Regional Climate Center.

warm fall and delayed frost, GDD accumulations from September 1 in southern Illinois can be as high as 1,000. That would be enough to mature most of even the late-planted crop.

In central and northern Illinois, warm fall weather and delayed frost could add about 100 to 150 GDD to the numbers in the last column of Table 2. That would allow the late-planted crop in central Illinois to get close enough to maturity that yields would not be reduced much. In northern Illinois, late-maturing hybrids planted late will be challenged to reach maturity before frost kills the leaves and stops the filling process.

Overall prospects for 2009 corn continue to be good, with a fair chance that most of the crop will reach maturity before frost. We'll continue to hope for warm, sunny days in September; if we get those, we could even end up with yields above the August 1 estimate, like we did in 2008, when final yield (179) was 7 bushels per acre above the August 1 estimate (172).—*Emerson Nafziger*

### Time and Heat Still Required for Soybean Yield

A month ago I was still optimistic that we could achieve average soybean yields, particularly for the late planting dates. But I am increasingly more nervous about the latest-planted soybeans due to the cool temperatures we've been having. In addition, numerous reports in some areas of sudden death syndrome (*Fusarium solani* f. sp. *glycines*) and white mold (*Sclerotinia sclerotiorum*) have people concerned, but personally I think that a warm,

sunny, and relatively dry September is more important to positively influence state soybean yields at this point.

Yield in soybeans is determined over a long flowering and pod-filling period that usually extends from the first week in July to the middle of September in a "normal" year. Unfortunately, as readers of *the Bulletin* are well aware, this year a high percentage of soybean acres were still being planted in the first week of July. Furthermore, even for the soybeans planted earlier, July 2009 was the coldest July on record in Illinois, so we didn't accumulate the maximum amount of GDD possible to maximize early vegetative growth. Because soybeans flower based on photoperiod, they reduce their vegetative stages more than their reproductive stages, when they must mature in seasons with a reduced number of growing days. When the time devoted to reproductive stages must be shortened, like this year, it is still difficult to estimate how many days are absolutely necessary to achieve normal yields.

Normally there are about 50 days that soybeans use to develop and fill pods between growth stages R4 and R8 (maturity). The amount of energy from sunlight that is captured and converted to produce soybean seeds during that time period is, of course, heavily dependent on sunlight intensity, temperature, and moisture conditions. There is still not a lot known about what "triggers" the plant to stop filling soybean seeds and drop leaves as maturity approaches. I have heard that two nights in a row below 55 °F after August 15 will do it, but I believe that is purely anecdotal. We do know that soybeans do not like cool nights and that growth is severely reduced below 60 °F dur-

ing the night. As I have driven around the state recently, most soybean fields look good from the windshield. The only problem is more closely comparing crop development to the calendar date and the uncertainty in what that means.

The USDA NASS Weather and Crops report noted that 63% of soybeans were blooming and 18% were setting pods on August 2. That advanced to 89% blooming and 58% setting pods as of August 17. The 11% not yet flowering and the 42% not yet setting pods by the second half of August were a concern. The number of acres setting pods jumped to 91% for the August 30 report, which is only 4% and 7% behind last year and the five-year average, respectively. This might appear good, but it still doesn't make up for the lost time devoted to setting pods during a normally hot, sunny late-August. This development time might be further shortened if the cold temperatures we've been experiencing speed up leaf drop and maturity.

Of course, estimating yield in soybeans is a challenging task, and using almost any method it results in an educated guess. One method of tracking used by many people is simply counting pods per area on an annual basis. I have received reports from several agronomists that pod counts measured in this manner are down compared with last year. What's still unknown is whether this is due to delayed development that will still be recovered in September, or if we're past the point of recovery. We know that in addition to pod set, seed fill is still critical; between 3 to 7 bushels of soybean seeds are accumulated per day between R5 and R7. So the number of "good" days in this period can still have critical (positive or negative) influence on final yield. This year a large majority of soybean acres will be between R5 and R7 during September, and some in late September.

There is not much we can do but hope for the favorable September weather plus a late October frost. For most of Illinois the first fall frost occurs in the

middle of October, but the dates range from the first week in the north to the third week in the south. If the first frost is moved back a week this year, several extra days of warm weather could help quite a bit. On the other hand, if the first frost moves earlier on us, much yield will be lost in the latest-planted fields. One thing that can be done now is to scout fields to develop an efficient harvest plan. Take into account the most critical fields to harvest first based on expected maturity, yield potential, and crop integrity. Also make sure you use this time to review proper combine settings according to manufacturer recommendations to prevent yield loss due to the harvest operation. The most common such loss occurs at the cutter bar, so give it careful attention. — *Vince M. Davis*

### Phosphorus and Potassium Applications for the 2010 Crop

The 2009 growing season is another challenging one. Late planting along with conditions both cooler and wetter than normal prevailing for most of the summer will push harvest later than most years this fall. However, it is not too late to start thinking about the 2010 growing season and what would need to happen this fall to be ready for next year. As we all know, in the last two to three years phosphorus (P) and potassium (K) prices have fluctuated a lot. I would venture to say that people have paid more attention than ever before to managing these nutrients during this period. As you approach fall, ask yourself whether you need to apply P and K, and, if so, how much? Would it be better to do a biennial application by applying enough nutrients for two crops, or are yearly applications preferable? Is it better to apply P and K in fall or spring? I will try to answer those questions from an agronomic standpoint, with the final decisions being yours as you evaluate the agronomic details, current prices, and your farm operation strategies.

Whether you need to apply P and K depends on your soil test levels. A soil test provides a measurement of the

availability of a nutrient for the crop. The tests for P and K have been correlated and calibrated to determine the levels of nutrients needed in the soil to produce certain levels of yield for various crops. In a yield response curve, the critical soil test level is the point at which near-maximum yields are obtained. If test levels are below that critical value, the crop will likely not produce maximum yield because the nutrient is deficient and reduces yield potential. On the other hand, if test levels are above the critical value, additional fertilizer is less likely to produce a yield response, because the soil has enough nutrient available to provide what the crop needs. When test levels are above the critical value but not excessively high, applying what the crop removes is always a good idea to maintain that level of fertility.

So in deciding how much you need to apply, if any at all, there is no substitute for soil testing. If your test indicates that the crop will have all that it needs, adding “fresh” fertilizer is not going to make a difference to the crop (though, again, it would be wise to apply fertilizer to maintain fertility at adequate levels). In contrast, if the test levels are excessively high, reducing or eliminating applications for a while may be desirable. Finally, if test levels are below the critical point, it is important to apply enough fertilizer to at least reach that point. Traditionally, most farmers apply P and K simultaneously to save time and money and to reduce the number of trips across the field. But remember that if after testing the soils you find only one of the nutrients is needed, don't worry about applying more of what you don't need. Additional information on P and K recommendations can be found in the new edition of the *Illinois Agronomy Handbook* (available for purchase at [www.pubsplus.illinois.edu](http://www.pubsplus.illinois.edu), or call 800-345-6087 during business hours).

Is an annual application better than a biennial one? Our research indicates that as long as you apply the needed fertilizer to ensure soil test levels show adequate nutrients to supply what the crops will need, there is no difference

in benefit in terms of yield response. However, if you prefer a biennial application, it is better to do it before the corn crop and to have soybeans in the second year as a residual feeder. An annual application is most effective when soils fail to build up or when the potential for nutrient fixation in the soil is high. Fortunately, with most soils in Illinois this is not a cause for concern.

Is a fall application of P and K better than a spring application? Again, this timing does not make a difference in the availability of these nutrients in typical Illinois soils. A fall application is often preferred because more time and equipment are available than during the busy spring planting season, soil compaction problems tend to be less because soils are typically drier in the fall, and P and K applications combined with tillage operations are more feasible in the fall. One potential drawback for fall applications is the fact that the nitrogen accompanying P in MAP and DAP is more susceptible to loss. However, the amount of N present in these applications is not very high, and the benefits of a fall application typically outweigh any small N losses that might occur. — *Fabián G. Fernández*

### Sulfur Research: We Need Your Help

Volunteers are needed throughout Illinois to participate in on-farm research measuring corn response to sulfur applications. While not widespread, the frequency of sulfur deficiency in corn has increased over the years since it was first seen in Illinois more than three decades ago. This increased frequency is likely the result of several factors, including less use of sulfur-containing fertilizers, insecticides, and fungicides; less atmospheric sulfur deposition; greater removal rates by increasing grain yields; increased use of conservation tillage, which may reduce sulfur availability; and fewer livestock operations, resulting in less application of manure.

**Soil conditions.** We are interested in light-colored soils (less than 2% or-

ganic matter, coarse texture, or both) and soils with an eroded phase. However, we would like to characterize sulfur response across the state, so we will also consider other more “traditional” Illinois soils. Fields that have received manure or sulfur applications within the last five years will not be considered.

**Equipment, sulfur sources, and timing.** Volunteers conducting these trials will follow a simple design applying 0 and 30 lb S/acre broadcast in a uniform portion of the field. A minimum three replications or as many as eight are needed for each field. Figure 1 shows a layout of the treatments randomly assigned within each replication for an eight-replication study. It will be important to georeference or clearly mark the center of each strip using different-colored flags or markers. Strips can be anywhere from 8 to 16 rows wide by 300 to 1,000 feet long. What is important is that the strip size allow accurate rate application and measurement of yield and, if possible, be wider than the harvest strip. However, if the combine is at least 12 to 16 rows wide, it is possible to harvest the strip without having border rows.

Sulfur sources will be limited to ammonium sulfate (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> (21-0-0-24); MicroEssentials sulfur (ME S) ME S10 (12-40-0-10); and elemental sulfur (0-0-0-90). If the sulfur source contains

other accompanying nutrients, the corresponding rates of those nutrients will need to be applied to other treatment strips to avoid a differential response to nutrients other than sulfur. If you use ammonium sulfate you would need to apply 26 lb N/acre to the other strips; if you use ME S10 you would need to apply 145 lb DAP (18-46-0)/acre.

The preferred application time is spring, but if the only time available is fall, we can accommodate that. Most important to us is having as many locations as possible throughout the state to be able to characterize the potential for corn response to sulfur in Illinois.

**Measurements for data collection.**

The only data volunteers will have to provide is the yield for each strip. This information can be collected by yield monitor or from a weigh wagon. Volunteers will not have to take plant or soil samples, but they will need to allow a researcher to visit the strips two or three times during the growing season.

If you are interested in participating (even if you are unsure whether your particular field would fit the study conditions) or if you have questions about how to find sulfur fertilizer or to have the fertilizer applied, please contact me (fernande@illinois.edu; 217-333-4426; Department of Crop Sciences, N-315 Turner Hall MC-046, 1102 South Goodwin Ave., Urbana, IL 61801). —*Fabián Fernández*

**REGIONAL REPORTS**

**Northern Illinois**

According to the Midwestern Regional Climate Center, precipitation the last two weeks of August averaged nearly 5 inches in the northwest crop reporting district and about 4.5 inches in the northeast district. Growing degree-day (GDD) accumulations from May 20 through September 1 are 275 GDD behind the 11-year average at Freeport and 321 GDD behind at DeKalb. Temperatures have been cooler than normal the past week. There is concern with the later-planted corn about whether it will reach maturity before frost.

White mold in soybeans has become somewhat common throughout the region since August 20. There have been a few reports of fungicide application for white mold control, which will have minimal benefit since infection occurs during flowering. Soybean aphid populations have been steadily increasing the last three weeks, but there have been only a few reports of insecticide spraying. Insecticide treatment for soybean aphids is not recommended past the R5 (beginning seed) soybean growth stage. Soybean sudden death syndrome (SDS) has been observed in some areas of the region.

Jim Morrison, crop systems extension educator, reminds alfalfa growers of the recommended last alfalfa hay harvest dates during the growing season: early September for the northern quarter of Illinois, September 10 for the central half, and September 20 for the southern quarter.

**Southern Illinois**

Crop maturation continues to be slowed by cooler-than-normal temperatures. The latest-planted corn is just completing pollination, while the latest-planted soybeans are at R4. The biggest issue currently facing soybean growers is an explosion in soybean aphid numbers. The problem is most serious in the latest-planted soybeans in the northern part of the region; it

30	Replication 1
0	
0	Replication 2
30	
0	Replication 3
30	
0	Replication 4
30	
30	Replication 5
0	
30	Replication 6
0	
0	Replication 7
30	
0	Replication 8
30	

Figure 1. Layout of treatments randomly assigned within each replication for an eight-replication study.

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becomes less of an issue as one goes farther south. Since soybean aphids have seldom been a serious problem this far south, growers have little experience dealing with them.

### **West-Central Illinois**

From a disease standpoint, wet weather and cool temperatures are starting to take their toll on field crops. Soybean fields are seeing a plethora of diseases, including white mold, more downy mildew than usual, and sudden death syndrome. Some areas of the region seem to be impacted more than others. The northeastern part is showing disease in almost every field, with plants dying and yields affected. The central part has scattered fields showing problems, but many look relatively healthy; they just need time to mature before frost.

Soybean aphid populations in the western half of the region are still relatively low. However, populations in the northeastern and southeastern

portions have reached threshold levels, and some farmers are spraying. In these areas, higher aphid populations are mostly on earlier-planted beans that are already at R5 and R6, so insecticides are probably not going to be economical.

Diplodia ear rot is starting to show in corn in the southeastern side of the region, where the crop is starting to turn. Corn is generally looking good, but development is generally behind, with crop stages at about 10% to 15% dent and the starch line about halfway down the kernel. The current cool, cloudy weather is not helping corn develop and move toward maturity.

Pastures, however, are growing great with the cool weather, and another cutting is just about baled.

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