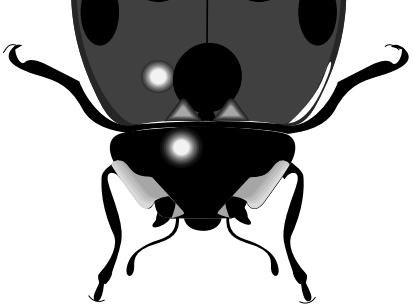


# PEST MANAGEMENT & CROP DEVELOPMENT

BULLETIN

**No. 24 / November 6, 2009**

**Executive editor: Vince M. Davis, Extension Soybean Specialist**

**Available on the Web at www.ipm.illinois.edu/bulletin**
**For subscription information, phone 217-333-2007, or e-mail acesnews@illinois.edu**





UNIVERSITY OF ILLINOIS EXTENSION


## Also in This Issue



## Agenda for the 2010 University of Illinois Corn & Soybean Classics

On behalf of my colleagues, I would like to announce the program details of the 2010 University of Illinois Corn & Soybean Classics. This series marks the 13th iteration of the Classics, continuing the tradition of providing our clientele with the most current and timely information related to crop production and pest management. All those involved with program planning and delivery have worked diligently to ensure that the 2010 Classics meet your needs.

The 2010 program, emphasizing crop production, pest management, economics, and the interactions among them, will begin at 9:00 and conclude by 3:30. Market updates will be provided throughout the day, and communication among speakers and participants is encouraged. Question-and-answer sessions are scheduled for both morning and afternoon. Lunch and a proceedings with synopses of all presentations are included with registration.

Six Classics will be held around the state:

- January 6 (Wednesday)—Mt. Vernon Holiday Inn
- January 8 (Friday)—Champaign I Hotel and Conference Center
- January 11 (Monday)—Springfield Crowne Plaza
- January 12 (Tuesday)—Bloomington DoubleTree Hotel
- January 13 (Wednesday)—Moline i wireless Center
- January 14 (Thursday)—Malta Kishwaukee College

The following presentations will be included in each of the Classics, though travel schedules may influence the order of speakers:

Terry Niblack—*New Information on the Distribution and Management of Corn Nematodes in Illinois*
Fabián Fernández—*Sulfur for Corn Production in Illinois*
Darrel Good—*Evaluation of Corn and Soybean Yield Forecast Models for 2009*
Vince Davis—*High-Yielding Soybeans: What Is High? What Is the Challenge?*
Gary Schnitkey—*Determinants of Farm Profitability*
Emerson Nafziger—*Corn Traits and Hybrid Performance*
Michael Gray—*Managing Insect Pests in a 5% World: A New Odyssey*
Aaron Hager—*What Does Tomorrow Hold?*
Carl Bradley—*A Scabby Start with a Moldy Finish: A Look Back at the Major Field Crop Diseases of 2009*

You can register for any of the Classics at www.cropsciconferences.org. Preregistrations, at a cost of $60, are accepted through December 20. Registrations received after that date and on-site are $75. If you have any comments or questions, please contact us at 800-321-1296.—*Aaron Hager*

## 2010 Illinois Crop Management Conferences to Address Critical Issues

The latest research information on critical crop production issues will be presented at four University of Illinois Regional Crop Management Conferences this winter. These two-day conferences are designed to address a wide array

of hot topics pertinent to crop production, soil and water, soil fertility, and pest management. The goal is to provide a forum for in-depth discussion and interaction among participants and university specialists.

Certified Crop Advisers can earn up to 13 hours of CEU credit. Complete program agendas and online registration will be available in early December. Advance registration, no later than one week before each conference, is $130. Late and on-site registration is $150. There is no one-day option.

Dates and locations for the conferences follow:

• **Southern Illinois, February 2–3**: Rend Lake Conference Center, Whittington. For more information, contact Dennis Epplin, Mt. Vernon Extension Center (618-242-9310); depplin@illinois.edu.

• **West-Central Illinois, February 3–4**: Northfield Inn & Conference Center, Springfield. Contact Robert Bellm, Edwardsville Extension Center (618-692-9434); rcbellm@illinois.edu.

• **East-Central Illinois, February 16–17**: I Hotel and Conference Center, Champaign. Contact Dennis Bowman, Champaign Extension Center (217-333-4901); ndbowman@illinois.edu.

• **Northern Illinois, February 17–18**: Kishwaukee College Convention Center, Malta. Contact Greg Clark, Whiteside Extension Unit (815-772-4075); gmclark@illinois.edu.

*—Robert Bellm*

## INSECTS

### Remember to Register for the AGMasters Conference, December 1 and 2

In less than a month, the brand new AGMasters Conference will already be in the history books. Registrations are coming in at a fast pace, so don't forget to get yours taken care of at your earliest convenience. The preregistration deadline is November 13. On-site registration will be available for day 1, but the cost increases from $135 to $175. Of special note—day 2, featuring advanced sessions, has only 120 available slots. If you wish to secure one, go to our online registration site (see below).

Those interested in certified crop advisor credits should be pleased that there is a nice selection: 2.5 for professional development, 9.0 for crop management, 9.5 for integrated pest management, and 2.5 for nutrient management. For more information about the conference and to register online, please go to www.cropsciconferences.org/agmasters. If you are interested in receiving information via Twitter, go to twitter.com/AgMastersConf.

We are excited about this program and look forward to seeing everyone at the new I Hotel and Conference Center in early December!—*Mike Gray*

### Preliminary Node-Injury Ratings for Corn Rootworm Products in Research Trials Near DeKalb, Monmouth, Perry, and Urbana: What Did We Learn in 2009?

This past growing season will long be remembered as one that began wet and finished in the same fashion. Let's hope that producers encounter far fewer planting and harvest frustrations in 2010. We consider ourselves fortunate in having been able to plant our corn rootworm efficacy experiments in a timely manner this spring (Urbana, April 18; Perry, April 23; Monmouth, May 5; and DeKalb, May 24). Once our experiments were in the ground, the precipitation began, leaving some areas of our research plots below water. The questions and answers here may be of use in interpreting the root rating data collected from our trials this year **(Table 1)**.

*Did the standing water affect corn rootworm survival in 2009?* Throughout the summer, many reported very low western corn rootworm densities in corn. We too observed fewer adults and lower root injury in our untreated checks, especially at Monmouth and Perry. Root damage in DeKalb also seemed lower in our checks than in most previous years. Root injury in the Urbana checks was still very good, ranging from about 2.0 (two nodes of roots pruned) to 2.5. We suspect that the reports of low western corn rootworm densities were primarily related to the saturated soils that occurred in many areas of the state during larval hatch (late May through early June). However, as the number of acres planted to Bt corn rootworm hybrids continues to increase, this also may help explain the lower densities.

*Did the wet spring and summer negatively affect soil insecticide performance?* Not in our trials. The soil insecticides Aztec 2.1G, Counter 20G, Force 2.25CS, and Lorsban 15G generally kept root injury below 0.5 (1/2 node pruned) on the node-injury scale. At Urbana, where injury in the checks was much greater, the soil insecticides kept root injury below 0.2. From time to time, concerns are expressed about the consistency of soil insecticide performance under extreme environmental conditions (too wet, too dry). These concerns were not realized in our 2009 studies—granted the level of pressure at three of the experimental locations can be described as low to moderate.

*Did the corn rootworm Bt hybrid treatments perform well in 2009?* Yes. In general, the Bt treatments kept root injury below 1/2 node of roots pruned. However, the HxXTRA (Mycogen 2T789 + Cruiser 250) Bt treatment (0.66) at Urbana had significantly more root injury than the soil insecticides. Producers should not assume that Bt corn rootworm hybrids always offer superior root protection compared with soil insecticides.

*Did the soil insecticide and Bt corn rootworm hybrid combination treatments result in very low root damage?* Yes. Not surprisingly, the soil insecticides when combined with YieldGard VT3 or HxXTRA hybrids resulted in node-injury ratings near 0, including at Urbana.

**Table 1. Preliminary Node-Injury Ratings for Corn Rootworm Control Products in Research Trials near DeKalb, Monmouth, Perry, and Urbana; University of Illinois, 2009.**

| Product | Rate per 1,000 row ft | Placement[3] | Mean node-injury ratings[1,2] | | | |
|---|---|---|---|---|---|---|
| | | | DeKalb[4] | Monmouth[5] | Perry[6] | Urbana[7] |
| **Soil insecticides** | | | | | | |
| Aztec 2.1G (DKC 61-22 RR2 + Poncho 250)[8] | 6.7 oz | Band | 0.21 d | 0.21 cd | 0.06 cd | 0.18 cd |
| Counter 20G (DKC 61-22 RR2 + Poncho 250) | 6.0 oz | SB furrow | 0.13 d | 0.32 c | 0.25 b | 0.13 cd |
| Force CS (DKC 61-22 RR2 + Poncho 250) | 0.46 fl oz | Band | 0.23 d | 0.08 cd | 0.03 cd | 0.18 cd |
| Lorsban 15G (DKC 61-22 RR2 + Poncho 250) | 8.0 oz | Band | 0.38 cd | 0.28 cd | 0.18 bcd | 0.05 d |
| **Rootworm Bt corn hybrids** | | | | | | |
| HxXTRA (Mycogen 2T789 + Cruiser 250)[9] | — | — | 0.05 d | 0.09 cd | 0.02 d | 0.66 b |
| HxXTRA (Pioneer 34P92 + Poncho 250) | — | — | 0.17 d | 0.12 cd | 0.05 cd | 0.5 bc |
| YieldGard VT3 (DKC 61-19 TG + Poncho 250) | — | — | 0.08 d | 0.06 cd | 0.02 d | 0.25 cd |
| **Soil insecticides + rootworm Bt corn hybrids** | | | | | | |
| Aztec 2.1G + YG VT3 (DKC 61-19 TG + Poncho 250) | 6.7 oz | Band | 0.01 d | — | — | 0.01 d |
| Counter 20G + YG VT3 (DKC 61-19 TG + Poncho 250) | 4.5 oz | SB furrow | 0.08 d | 0.03 cd | 0.03 cd | 0.04 d |
| Force CS + HxXTRA (Pioneer 34P92 + Poncho 250) | 0.346 fl oz | Band | 0.02 d | 0.01 cd | 0.01 d | 0.02 d |
| Force CS + HxXTRA (Pioneer 34P92 + Poncho 250) | 0.46 fl oz | Band | 0.01 d | 0.01 cd | 0.02 cd | 0.01 d |
| Force CS + YG VT3 (DKC 61-19 TG + Poncho 250) | 0.346 fl oz | Band | 0.01 d | 0.02 cd | 0.01 d | 0.01 d |
| Force CS + YG VT3 (DKC 61-19 TG + Poncho 250) | 0.46 fl oz | Band | 0.01 d | 0.00 cd | 0.01 d | 0.01 d |
| Lorsban 15G + HxXTRA (Mycogen 2T789 + Cruiser 250) | 8.0 oz | Furrow | 0.03 d | 0.04 cd | 0.03 cd | 0.03 d |
| SmartChoice 5G + YG VT3 DKC 61-19 TG + Poncho 250) | 3.5 oz | SB furrow | 0.01 d | 0.03 cd | 0.03 cd | 0.1 cd |
| **Untreated checks** | | | | | | |
| DKC 61-22 RR2 + Poncho 250 | — | — | 0.78 c | 0.9 b | 0.2 bc | 2.16 a |
| Mycogen 2T777 RR2 + Cruiser 250 | — | — | 1.99 a | 1.11 b | 0.52 a | 2.55 a |
| Pioneer 34P87 HxI + Poncho 250 | — | — | 1.41 b | 2.18 a | 0.34 b | 2.42 a |

[1]Node-injury ratings are based on the 0-to-3 root-rating scale developed by Oleson et al. (2005): 0.00—no feeding damage; 1.0—one node (circle of roots), or the equivalent of an entire node, pruned back to within about 1.5 inches of the stalk (or soil line if roots originate above ground nodes); 2.0—two complete nodes pruned; 3.0—three or more complete nodes pruned (highest rating that can be given).

[2]Means followed by the same letter within a column do not differ significantly ($P = 0.05$, Duncan's New Multiple Range Test.)

[3]Band: insecticide applied in a 5-inch band over the planted row; furrow: insecticide directed into the seed furrow; SB furrow: insecticide applied through a SmartBox insecticide delivery system and directed into the seed furrow.

[4]DeKalb: Planted on May 24 into an area planted to a trap crop in 2008 (late-planted corn interplanted with pumpkins). Roots were evaluated on July 29.

[5]Monmouth: Planted on May 5 into an area planted to a trap crop in 2008 (late-planted corn interplanted with pumpkins). Roots were evaluated on July 20.

[6]Perry: Planted on April 23 into an area planted to a trap crop in 2008 (late-planted corn interplanted with pumpkins). Roots were evaluated on July 20. The insecticide-only treatment (no rootworm Bt hybrid) Counter 20G was planted with Pioneer 34P87 HxI + Poncho 250. For the insecticide and Bt rootworm hybrid combination, both Counter 20G and SmartChoice 5G were applied with HxXTRA (Pioneer 34P92 + Poncho 250).

[7]Urbana: Planted on April 18 into an area planted to a trap crop in 2008 (late-planted corn interplanted with pumpkins). Roots were evaluated on July 22. The insecticide-only treatment (no rootworm Bt hybrid) Counter 20G was planted with Pioneer 34P87 HxI + Poncho 250. For the insecticide and Bt rootworm hybrid combination, both Counter 20G and SmartChoice 5G were applied with HxXTRA (Pioneer 34P92 + Poncho 250). Lorsban 15G was applied in-furrow when used as an insecticide treatment only (no rootworm Bt hybrid used). Lorsban 15G was applied in a band with the HxXTRA (2T789) Bt hybrid.

[8]Seed treated with Poncho 250, 0.25 mg a.i. per seed.

[9]Seed treated with Cruiser 250, 0.25 mg a.i. per seed.

*Will yield data be provided to establish whether it made economic sense to combine soil insecticide and Bt corn rootworm treatments in 2009?* Yes. As soon as harvest is complete and yields can be analyzed, we will share this information with our clientele during winter extension meetings. In wet growing seasons, yields are not typically as affected by root injury. Consequently, we will be surprised to see significant yield differences across most of the treatments.

*Because western corn rootworm adult densities were reported as very low across much of Illinois in 2009, will corn rootworm Bt hybrids pay for themselves in 2010?* It depends on the densities of western corn rootworms from field to field, environmental conditions, and the cost of seed. Because most growers do not scout their corn or soybean fields for western corn rootworm adults, they have very little information with which to make informed management decisions for next season. Corn rootworm management decisions need to be made field by field. Because of the overall very significant production investment in corn, producers need to make their corn rootworm management decisions very cautiously. If scouting has not taken place, producers should assume they have an economic population of western corn rootworms and plant a Bt corn rootworm hybrid or use a soil insecticide. Because of the expansion of the variant western corn rootworm, this recommendation is appropriate for first-year corn (corn following soybeans) or continuous corn in 2010 for much of Illinois.—*Mike Gray and Ron Estes*

### Soybean Aphids Significantly Affected by Fungal Disease This Fall

As I reported in October in *the Bulletin* (ipm.illinois.edu/bulletin/article.php?id=1229), densities of soybean aphids were very impressive this fall as winged aphids left soybean fields in search of their overwintering host, the common buckthorn (*Rhamnus cathartica* L.). The large and widespread flight of aphids brought speculation and concern that the overwintering population (eggs) of soybean aphids would be significant and result in management challenges next year in soybean fields. Entomologists David Voegtlin (Illinois Natural History Survey) and Christian Krupke (Purdue University) conducted a survey on October 18 and 19 of soybean aphids on buckthorn at sites in southeastern Michigan and northwestern and northeastern Indiana. They observed very low numbers of eggs on the overwintering host. Why? At most observation sites, they found many dead winged aphids on buckthorn leaves. The aphids appeared to have been infected with a fungal disease. David indicated that if other areas of the Midwest are similar, we shouldn't expect this insect to begin 2010 with a large spring flight. I extend my thanks to David and Christian for sharing the results of their survey.—*Mike Gray*

## PLANT DISEASES

### Dealing with Moldy Corn and Mycotoxin Risks

We've already had two articles in *the Bulletin* this year about corn ear molds (see "Diplodia Ear Rot Causing Problems in Corn Across the State" in issue 23 and "Fungal Ear and Stalk Rots" in issue 22), but questions are continuing to come in. The biggest two problems appear to be Diplodia ear rot and Gibberella ear rot. However, with all of the rainfall we've had, a number of other "opportunistic" fungi can move in as well. All of the ear rots can cause problems at the elevator with discounts due to damaged kernels or presence of foreign material (especially when the cob is badly rotted and does not separate well from the grain). Some of the ear rot fungi can cause additional problems because of their ability to produce mycotoxins that can contaminate the grain. If fed to livestock, moldy corn with mycotoxins can cause serious problems and even death, especially in nonruminant and young animals. Below are brief descriptions of some of the ear rots showing up this year and their risk in producing mycotoxins.

*Diplodia ear rot*. Diplodia ear rot was covered extensively in issue 23 of *the Bulletin* (ipm.illinois.edu/bulletin/article.php?id=1233). In the U.S., the Diplodia ear rot fungus is not known to produce any mycotoxins, but other fungi that do produce mycotoxins may colonize Diplodia–affected ears and kernels.

*Gibberella ear rot*. Gibberella ear rot has been reported this year in Indiana (extension.entm.purdue.edu/pestcrop/2009/issue26/index.html#corn), Iowa (www.extension.iastate.edu/CropNews/2009/1002robertson.htm), and Missouri (ppp.missouri.edu/newsletters/ipcm/archives/v19n21/a8.pdf), and reports from Illinois also indicate its presence. Gibberella ear rot is caused by the fungus *Gibberella zeae*, which is the sexual stage of the fungus *Fusarium graminearum*. The disease generally appears as a pink to red fungal growth on the kernels. This growth generally occurs at the tip of the ear and can be associated with insect, bird, or hail damage. The Gibberella ear rot fungus can produce mycotoxins such as deoxynivalenol (DON, aka vomitoxin) and zearalenone.

*Fusarium ear rot*. Fusarium ear rot, caused by *Fusarium verticillioides* (formerly *F. moniliforme*) and *F. proliferatum*, generally is one of the more common ear rots observed in most years, but it may be less prevalent this year. Fusarium ear rot generally appears as individual or small groups of kernels with white-pink fungal growth. Affected kernels also may have a "starburst" symptom. The fungi that cause Fusarium ear rot may produce fumonisin mycotoxin.

*Penicillium ear rot*. Penicillium ear rot, caused by *Penicillium* species, is found most often on ears that have been damaged (by insects, birds, hail, etc.). Kernels affected by Penicillium ear rot generally have a green to blue-green fungal growth on and between the kernels. The fungi also can infect

the kernel embryo, which causes a blue discoloration known as "blue eye." Fungi that cause Penicillium ear rot can produce ochratoxin mycotoxins.

*Opportunistic fungi*. A number of opportunistic fungi are present in corn fields, and when wet weather prevails and harvest is delayed, some of these fungi will begin to grow on corn ears and kernels. In some cases, corn that has been killed prematurely by frost or stressed by other factors may be more susceptible to invasion. Some observations of kernels affected by Cladosporium ear rot (caused by *Cladosporium herbarum*) have been reported in Illinois and Iowa (www.extension.iastate.edu/CropNews/2009/1030robertsonmunkvold.htm).

*Implications for crop insurance, harvest, and storage*. If you have crop insurance and have fields that are affected by ear rots, be sure to contact your agent as soon as possible, as particular documentation may be needed for a claim to be filed. If possible, harvest affected fields first so the grain can be dried to reduce moisture levels as quickly as possible. Adjusting the combine for minimum kernel damage and maximum cleaning may help minimize the number of infected kernels making it to the elevator.

To reduce the spread of molds to unaffected kernels in storage, it is important to dry the grain to below 18% moisture (15% moisture for longer-term storage). In general, damaged grain will not store well beyond the winter months.

*Mycotoxin testing and feeding risks*. Moldy grain should always be tested before being fed to livestock. In Illinois, grain can be tested for mycotoxins at the Illinois Department of Agriculture's Centralia Animal Disease Laboratory (www.agr.state.il.us/AnimalHW/labs/centralialab.html). Some grain inspection services may also be able to test grain samples for specific mycotoxins.

Mycotoxin risk levels for dairy cattle are listed in **Table 2** (expressed on a total ration dry matter basis). Dilution with clean feed can reduce mycotoxin levels, but contaminated feed can vary greatly in mycotoxin concentration (note that some toxins are listed as parts per billion and others as parts per million). Additional mycotoxin risk levels for additional livestock animals are available from the Food and Drug Administration's Center for Veterinary Medicine (www.fda.gov/AnimalVeterinary/Products/AnimalFoodFeeds/Contaminants/ucm050974.htm).

**Table 2. Mycotoxin Risk Levels for Dairy Cattle.**

| *Mycotoxin* | *Risk level for dairy cattle* |
|---|---|
| Deoxynivalenol (DON; vomitoxin) | <5–6 parts per million |
| Fumonisin | <25 parts per million |
| T-2 toxin | <100–200 parts per billion |
| Zearalenone | <300 parts per billion |
| Aflatoxin | <20 parts per billion |

Adding a mycotoxin binder to feed can reduce the impact of toxins by reducing their impact in the digestive tract and/or not allowing them to be absorbed. Binders include yeast cell wall extracts or MOS products and clay binders.

It is also important to know that distillers grain from ethanol production can concentrate the level of toxins in the original corn used. It is thus important to know the sources of distillers grain before feeding. Corn silage made late in the season with mold damage could have toxins, but the low pH will stop additional toxin production. Adding propionic acid at the time of ensiling can reduce mold development.—*Carl A. Bradley and Mike Hutjens*

## CROP DEVELOPMENT

### Late Harvest Issues

Corn harvest continues at a snail's pace in Illinois, with only 19% of the crop harvested by November 1. October was a very wet month, and the cool temperatures resulted in very slow drying, even if the crop reached physiological maturity earlier in the month. There are some fields in northern Illinois where the season ended prematurely with freezing and loss of leaf area, in some cases when the grain was still at or above 40% moisture.

*Can we wait for grain to dry down?* Because warm air can hold so much more water vapor than cold air, it is impossible to get rapid drying of grain in the field unless temperatures are in the 70s and 80s after the grain reaches maturity. In 2009, some two-thirds of the Illinois corn crop reached maturity after the end of September, and temperatures during most of October have been below normal. So there has been no rapid dry-down period for most of the crop. By the end of October, average daytime high temperatures have dropped into the 50s over most of the state, and the chance of having even a few warm days with good drying conditions diminishes rapidly. So while we can wait until grain dries down some, we would expect on average for grain moisture to change very slowly in November. Expecting it to drop by as much as a point per week is optimistic.

*Why has grain been so slow to dry down?* Most of the slowness has resulted from the late maturity of the crop followed by the cool, cloudy, rainy, and humid weather since maturity. And while kernel size may be good, most kernels reached their maximum dry weight under cool conditions or prematurely, which we think tends to make the grain dry more slowly. Ears in some cases have remained upright, helping to trap water. Cobs have generally been wetter than grain, which means slower grain drying.

*What about test weight?* One of the issues in 2009 is the low test weights being recorded in many parts of the state, in some cases leading to dockage. Number 2 yellow dent corn has a minimum test weight of 54 pounds/bushel, and there are many reports that test weights of high-moisture corn are in the low 50s or upper 40s. It appears that most corn has test weight

measured "as is," without adjustment for its high moisture content. We took test weights on some high-moisture samples this fall, before and after drying; in most cases test weights rose by 2 to 4 pounds during drying.

There were some exceptions, however: one sample tested by Lyle Paul at DeKalb was of corn that had not finished filling, and test weight actually dropped to below 50 pounds/bushel when it was dried (without heat). Another sample that started at 33% moisture and under 50 pounds increased by only 2 pounds after drying. Other samples from DeKalb and from Urbana all ended up at 56 to 57 pounds/bushel when dry. The only way to make sure you aren't docked for low test weight is to dry corn before taking it in.

*Why do so many bushels "disappear" from wet grain I haul to the elevator?* This season has been difficult for everyone, including elevators, which in some cases have had trouble delivering grain on time because grain is coming in so slowly. Drying capacity is also taxed to its limits this year, and in many cases dryers are simply not up to the task. This is no one's fault—we really can't spend what it would take to be ready for such an unusual year—but it does mean a lot of frustration added to what has been a frustrating year. Having 56,000 pounds of 28% moisture corn on a semi-trailer turn from 1,000 "wet bushels" into 818 dry bushels (13 points lost times 1.4% shrink per point lost) and paying more than 40 cents per bushel on top of that for drying takes a large chunk out of the value of the load. These losses are much larger than we have commonly seen simply because the grain is so wet.

One thing to remember is that the added weight due to extra water in wet corn was never really "grain yield" to begin with; it's only water that never got the chance to evaporate from the grain. So it's more accurate to consider only the "dry bushels" when we think about how much corn is on the truck—"wet bushels" are part water, so they aren't really grain bushels. It is true, however, that a shrink factor of 1.4 is larger than the "physical shrink" of about 1.2% per point. This protects the elevator against other weight losses, but in most cases it will mean that the buyer ends up with more bushels than were paid for. Again, the only way to prevent this is to dry grain before it's taken to the elevator.

*How much loss can we expect as corn "weathers" in the field?* If mold is continuing to grow on and in kernels, kernel weight will continue to decrease. If the grain is relatively bright with little damage, then kernels should be able to keep their weight almost unchanged. There have been a few reports of sprouting, most commonly when water has sat in the husks at the base of ears that have remained upright, but the cool temperatures have helped reduce sprouting. The biggest threat now for yield loss as corn sits in the field is dropped ears and serious lodging with stalk breakage, which can mean that ears detach and stay on the ground. You can shake stalks to see if ears stay attached; in most cases, if shank strength is good now it should remain good enough to hold ears to harvest. We do not think that any significant "dry matter loss" occurs as healthy grain dries, especially with the lower temperatures we are having now. If we do get unexpectedly good drying conditions before harvest, chances for kernel loss at the corn head increase quickly as kernel moisture drops into the lower 20s. Weakened cobs might contribute to such loss.

While it is difficult to predict harvest loss as a function of time that mature corn spends in the field, chances are good that field losses shouldn't increase too rapidly if the weather stays reasonably good into November. At the same time, it takes only about 2 kernels per square foot or one ear for every 250 square feet or so to make a bushel per acre.

*Might it pay to leave corn in the field even after it reaches the mid-20s in moisture?* Soybean harvest will take priority over corn harvest in many areas, so corn may reach 25% moisture or less before it can be harvested. If the crop seems to be standing well and keeping its ears, waiting until grain loses a few more points of moisture might in some cases pay, but this also increases risk. At a yield level of 200 bushels per acre, corn at $3.50 per bushel, and drying charges of 3.5 cents per bushel per point, shrink and drying "overage" totals a little more than 4 cents per point per bushel, or about $8 per acre for each point of moisture lost in the field rather than dried artificially. If the weather forecast is good, this savings might well exceed the potential field loss. Of course, corn is never really safe until it's in the bin and dried, so most people will opt to keep the combine running, even if this could cost more than additional field drying could save.

*Can we do tillage after late harvest?* With a great deal of compaction last spring, many had hoped to take advantage of dry soils this fall to do some compaction-relieving deep tillage. With soils wet and unlikely to dry much before freezing weather, this hope might not be realized. It does little good to try to shatter soils to relieve compaction when the soil is wet; chisel or ripper points simply "mud through" wet soils and relieve few problems. This is likely to be the case next spring as well, which might mean that we "re-compact" soils during the planting operations next spring, and again have to hope for good rainfall next year to help minimize negative effects of compaction. So while deep tillage might not be helpful, shallow tillage, including shallow strip tillage, might provide a soil surface that warms and dries a little earlier next spring. Just remember that any trip over the field, other than one made when soils are frozen, can cause even more compaction.—*Emerson Nafziger*

## Challenge Yourself for Higher Soybean Yields in 2010

The Illinois Soybean Association is launching an Illinois Yield Challenge to facilitate statewide on-farm research and innovation to increase soybean yields. Yields in Missouri greater than

150 bushels per acre in 2007 have already increased attention and experiments aimed at increasing yields in Illinois. This has been the topic of many of my 2009 field day presentations and will also be my focus at the 2010 Corn & Soybean Classics (www.cropsciconferences.org). This interest in experimentation to increase yields has encompassed university researchers and farmers alike. On-farm trials can provide important first-hand results and personal education. Farmers are extremely innovative and can find things that work best for their operations by trying new approaches. I know that this year evaluations and conclusions will be drawn from the final yields of many well-designed on-farm soybean experiments. Unfortunately, conclusions will also be drawn from some "experiments" that were, well, less well designed. I am talking particularly about efforts where new practices or products were tried as a "trial" on an entire field without a proper check or comparison plot.

To explain how a field experiment should be properly designed would depend heavily on the research hypothesis being questioned. However, there is no substitute for, no way to overlook, and simply no way to avoid the need for an appropriate control or check plot for comparison. Good research also needs a collection of sufficient observations and data from which conclusions can be drawn.

There are some great on-farm research resources online. One is from the Plant Management Network (www.plantmanagementnetwork.org/edcenter/seminars/OnFarmResearchConference), and another, titled "A Practical Guide to On-Farm Research," is by Bob Nielsen of Purdue University (www.agry.purdue.edu/ext/corn/talks/OnFarmResearch2009/index.htm). The Illinois Soybean Yield Challenge will be an additional option for on-farm soybean research guidance in Illinois next year.

For many of the reasons I've described above, the new challenge is unique to a yield contest because each on-farm participant will pair an "investigative plot" with a "normal practices" plot. With much cooperation from University of Illinois Crop Sciences faculty and the National Soybean Research Laboratory, we are striving to build a new, systematic way of harnessing the power of on-farm research to improve soybean yields through teamwork in Illinois.

All competitive yields will be the average of several farmer participants, with teams grouped according to the nine USDA National Agriculture Statistics Service (NASS) crop reporting districts in the state. The categorization eliminates some of the advantages and disadvantages of differing soil types and environments across Illinois and allows us to compare yields with USDA NASS crop reports. Therefore, no overall state yield challenge winners will be named.

Teams can be sponsored by any company or they can form independently, but I hope that many sectors of the agriculture production industry get involved since many different sectors are advancing technology and products in ways that should enhance yield or improve the ability to manage soybeans. This challenge could play an important role in science by providing us questions to ask in other controlled experiments. Hopefully we can validate and refine results from the questions generated and then research and refine those into recommendations from which all Illinois farmers can benefit.

For more information about the program, visit www.soyyieldchallenge.com or contact the Illinois Soybean Association at 309-663-7692. Registration will continue until April 1.—*Vince Davis*

## REGIONAL REPORTS

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

• North (Northwest and Northeast districts, plus Stark and Marshall counties)

• West-central (West and West Southwest districts, and Peoria, Woodford, Tazewell, Mason, Menard, and Logan counties from the Central district)

• East-central (East and East Southeast districts [except Marion, Clay, Richland, and Lawrence counties], McLean, DeWitt, and Macon counties from the Central district)

• South (Southwest and Southeast districts, and Marion, Clay, Richland, and Lawrence counties from the East Southeast district)

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

**Northern Illinois**

There wasn't much harvesting in the last two weeks in October because of frequent precipitation. Corn harvest progress varies from nearly 20% complete in parts of the northwest region to about 5% in the northeast. Moisture continues to be very high, with most harvested corn reported at nearly 30% or higher. Also, low test weights and concerns over molds and mycotoxins persist throughout the region. Yields have generally been better than expected. Casual observations in October indicated that many corn fields were not at black layer when a killing frost occurred on October 9 and 10. Commercial and on-farm drying capacities are also contributing to the slow harvest. There is expected to be corn standing throughout the winter, but November's weather will influence how many acres actually remain unharvested.

U of I Extension Newsletter Service
University of Illinois
at Urbana-Champaign
1917 S. Wright St. Ext., MC-710
Champaign, IL 61820

Soybean harvest has been slow to start up this week. Completion ranges from 40% to 70%, with lower percentages in the northeast.

Extension educators conducting the annual fall corn borer survey found extremely low numbers of infested fields. In some counties no infested plants were found in inspections of 10 randomly selected fields.

Some winter wheat has been seeded, but substantially fewer acres than last fall.

**Southern Illinois**

After record rainfall in October, the weather has finally cleared and harvest progress has resumed. Yields of both corn and soybean are excellent, considering the late planting dates. The bottleneck on corn harvest remains the high moisture levels of the crop coming in out of the field, with grain dryers unable to keep pace with harvesting speed.

Wheat acreage planted to date is down considerably from last year. While it's not impossible to plant wheat this late, the prospects for good yields are greatly diminished.

**Contributing Authors**

**Carl A. Bradley,** carlbrad@illinois.edu, 217-244-7415

**Vince M. Davis,** davisv@illinois.edu, 217-244-7497

**Mike Gray,** megray@illinois.edu, 217-333-6652

**Aaron Hager,** hager@illinois.edu, 217-333-4424

**Mike Hutjens**, hutjensm@illinois.edu, 217-333-2928

**Emerson Nafziger,** ednaf@illinois.edu, 217-333-4424

Published by University of Illinois Extension and Information Technology and Communication Services, College of Agricultural, Consumer and Environmental Sciences, University of Illinois.



UNIVERSITY OF ILLINOIS
EXTENSION

Helping You Put Knowledge to Work

University of Illinois
U.S. Department of Agriculture
Local Extension Councils Cooperating