Proceedings of Two Key Educational Events in 2008 Are Accessible on the Web

The 60th Illinois Crop Protection Technology Conference was held on the University of Illinois campus on January 9 and 10. The 2008 University of Illinois Corn & Soybean Classics were held on five dates at five different locations in January. Together, these educational events comprise our major statewide extension education efforts during the winter, and we capture their content by publishing proceedings.

The Proceedings of the 2008 Illinois Crop Protection Technology Conference can be accessed at www.ipm.uiuc.edu/education/proceedings/icptcp2008.pdf. There are 23 papers written by university and industry experts from Illinois, Iowa, Indiana, Minnesota, Missouri, Nebraska, North Dakota, and Ohio. The topics range from issues that will affect agriculture for years to come to pest and crop management recommendations for 2008.

The Proceedings of the 2008 Corn & Soybean Classics can be accessed at www.cropsci.uiuc.edu/classic/C_S_Classic_2008.pdf. The nine papers were written by University of Illinois Extension specialists, with emphasis on the here-and-now of crop economics and management. Both publications include considerable information about many topics of relevance for the coming growing season. While waiting for the weather to improve for fieldwork, consider reviewing some of the papers published in these proceedings.—Kevin Steffey

INSECTS

Pioneer’s Optimum AcreMax 1 Insect Protection—What Is It?

What do we know about Optimum AcreMax 1 Insect Protection? Not much. Many of us at universities learned about the proposed system at the same time as everyone else, so we can’t answer most of the questions posed about it. However, I will point out one key phrase in all of the marketing pieces you probably have seen: Pending EPA approval. The Optimum AcreMax 1 Insect Protection system (in its simplest form, a refuge-in-the-bag for rootworm resistance management) has not been approved by the EPA. So for anyone considering their own refuge-in-a-bag for Bt corn in 2008: Don’t—it’s not legal.

Time will tell whether this proposed system passes the EPA’s “acid test,” which will require input from insect resistance management and rootworm experts. Until then, requirements for insect resistance management for rootworm Bt corn remain the same as they have been since 2003, when hybrids were approved for commercial use—20% non-rootworm Bt corn within the same field as the rootworm Bt corn, or in an adjacent field.

To Pioneer’s credit, their informational publications (e.g., Walking Your Fields) include detailed explanations of current refuge guidelines and an overview of the Compliance Assurance Program. However, the timing of their announcement just before planting leaves a bit to be desired. There already is enough confusion about refuges and insect resistance management without adding a not-yet-approved approach for insect resistance management.

For a concise explanation of insect resistance management requirements for Bt corn for control of both rootworms and corn borers, visit the National Corn Growers Association Web site and look for “Importance of Managing Bt Technology” at www.ncga.com/biotechnology/insectMgmtPlan/importance_bt.asp.—Kevin Steffey

Preparations for Early-Season Insect Activity

Over the years, I have learned that predicting the occurrence of insect problems, or the lack of them, is not very wise, so I usually try to avoid it. One
thing is certain, however—early-season insect problems will occur in some fields in some parts of the Midwest in 2008. How’s that for an enlightened statement?

All kidding aside, it is likely that most growers and their advisers have already given thought to dealing with early-season insect problems, from the secondary insects that attack corn in the spring (e.g., black cutworms, grape colaspis, white grubs, wireworms) to alfalfa weevils in alfalfa to aphids and armyworms in wheat. Every one of these insect problems, and many others, have likely affected fields in your area over time, so thoughts on management often are foremost in the spring after alfalfa and wheat resume growth and after corn seeds is in the ground. Following are comments about insects that attack crops early in the spring.

**Alfalfa.** The primary insect of concern among alfalfa growers before the first cutting is the alfalfa weevil. This insect has not been a widespread problem in Illinois over recent years, but its presence (or absence) is always worth investigating. We will learn soon enough whether the harsh and unpredictable winter weather has had any impact on overwintering adults and eggs in southern Illinois. (Phil Mulder, extension entomologist at Oklahoma State University, has indicated that populations of alfalfa weevil eggs in Oklahoma were much lower in early 2008 than in 2006 and 2007: www.ento.okstate.edu/pdil/2008/PDIA7-2.pdf.) Nonetheless, people should make plans in advance to scout for these defoliators relatively soon.

Most experts suggest that scouting for alfalfa weevils should commence when about 150 to 200 degree-days above a threshold of 48°F have accumulated from January 1. A quick check of the “Daily Pest Degree-Day Accumulation” (www.sws.uiuc.edu/warm/pestdata) on April 2 revealed that as of April 1, 196, 165, and 171 degree-days for alfalfa weevil development had accumulated at Dixon Springs, Rend Lake, and Belleville, respectively. So the time for scouting for alfalfa weevils is now for southern Illinois alfalfa fields. Our fact sheet on the Web (www.ipm.uiuc.edu/fieldcrops/insects/alfalfa_weevil/index.html) provides the necessary information to enable accurate decision-making related to alfalfa weevil management.

**Corn.** Obviously, corn growers’ biggest concern right now is for the soil to warm up and dry out enough that field activities can begin in earnest. Consequently, concern about early-season insect problems takes a back seat. In fact, many corn growers have already made plans to manage these inconsistently occurring pests by buying seed treated with an insecticidal seed treatment (e.g., Cruiser, Poncho) or by planning to use a granular or liquid soil insecticide to prevent insect attack. We will have to wait a little while to find out whether any of the so-called secondary insects create headaches after the corn is planted, but it’s not too early to encourage plans for scouting as soon as seedlings begin to emerge. This advice goes for all fields, even those protected with insecticides (seed-applied, granules, liquids). Many corn growers have learned firsthand that heavy infestations of white grubs or wireworms can overcome the claims for their control on insecticide labels. If such a situation arises, a quick response could be the difference between profit and loss.

**Wheat.** Aphids likely will be the first insects noticed in spring wheat fields, though their presence then typically doesn’t mean much. They usually do not cause much injury to wheat on their own unless numbers are extremely high. A working guideline from the University of Kentucky is to treat wheat in late spring only if large numbers of aphids are present or if there is an average of 50 or more aphids per head during grain filling (basically guidelines for a few weeks from now).

The other potential early-season pest of wheat, and the insect pest of greatest concern in Illinois during most years, is the armyworm. However, this insect does not overwinter in Illinois, and its arrival here as moths this spring has yet to be documented. So we still have some time before any real concerns with armyworms. Read more about them at www.ipm.uiuc.edu/fieldcrops/insects/armyworm/index.html.

As reports of any of these insects are received, we will spread the word. I invite anyone who becomes aware of isolated or widespread problems with early-season insects to contact either me or Mike Gray. Such knowledge usually benefits everyone.—Kevin Steffey

**WEEDS**

**Identification and Control of Burcucumber**

Burcucumber (*Sicyos angulatus*) is a summer annual weed species typically found near creeks and rivers, but it has extended its range to include uplands and farm fields. This weed is troublesome in both corn and soybeans for three reasons: it has a discontinuous emergence pattern, with plants emerging late into the growing season when there are few effective herbicide options; it is very competitive (for example, it can reduce soybean yield by 43%); and its vining growth habit interferes with harvest.

Burcucumber, native to the U.S., belongs to the same family as the cultivated cucumbers we grow in gardens. Most burcucumber emerges in May and June, but emergence continues throughout the growing season through early fall, with subsequent flushes being associated with rainfall. After emergence, this weed can be identified by its large ovate cotyledons. Leaves are typically thin, with 3 to 5 lobes, a span up to 10 inches in diameter, and a sandpaper-like texture. Tendrils form at the base of the petioles and attach themselves to whatever is available. The stem is very pubescent, almost spiny. Burcucumber vines may reach lengths of 15 to 25 feet and can easily span across corn and soybean rows and cause lodging.

In the late summer and fall, green and white flowers develop on the burcu-
cumber and produce small fruits, with one seed within each fruit. The fruits are typically found in clusters of up to 20. Burcucumber seed is similar in size to that of watermelon. The seed is covered in a thick seed coat, which aids in its persistence in the soil and is the reason burcucumber remains a problem long after establishment. The fruit encasing the seed is oblong, typically 2 to 5 cm long, and covered in long spines that aid in dispersal.

Burcucumber management requires an integrated approach of preventive, mechanical, and chemical programs. The preventive tactic focuses on seed movement, while the mechanical and chemical programs stress reducing the establishment of burcucumber. What programs you choose to use depend on your level of infestation, but the main goals are to prevent burcucumber introduction into areas where it is not already established and to prevent seed production in areas where burcucumber already exists.

Preventative tactics. Late-season scouting to locate suspected areas where populations are just becoming established is a must. This task may be very labor- and time-intensive, but it is less costly than controlling an already established population. If possible, avoid running a combine or tillage equipment through areas that are infested with burcucumber. It is also of great benefit to combine areas with established burcucumber populations last. Burcucumber seed is similar in size to several crops, so the seeds easily become hung up in the combine or other equipment and are then transported to new areas. Just running the separator and spreader of the combine is typically not enough to get these seeds out. Use of an air compressor, a water hose, and a broom to sweep out the combine is a very good idea and a more thorough method to rid the combine of these seeds.

Mechanical tactics. Mowing pastures, ditches, and roadsides where burcucumber is found can significantly reduce the plants. Tillage, however, has produced mixed results. Tillage can bury the seed, but seeds can germinate at depths of 6 inches. Germination was also found to be higher following tillage. Cultivation in areas with low infestation was effective at controlling burcucumber. Alternatively, no-till leaves the seeds on the soil surface where they may not germinate or germinate over a shorter period. Overall, the persistence of burcucumber seed makes it difficult to control regardless of the tillage practice used.

Other not-so-popular options are early harvest of corn as silage and destroying the infested area of the field. We advise these tactics only for severe infestations and if done before seed production.

Chemical tactics. Options for chemical control are available, but they generally are not as effective when used as stand-alone tactics. Because of burcucumber's extended emergence pattern, any herbicide program must follow a preemergence product with a postemergence product—one-pass programs do not stand a chance with burcucumber. Including a residual product is also very beneficial. There is no promise that even a pre-followed-by-post program will be sufficiently effective against this weed. Late flushes may require split shots or follow-up applications. Post-directed applications are also a viable option for severe infestations.

Glyphosate is effective at controlling emerged burcucumber, but it lacks soil residual activity. One benefit of glyphosate is that it can be applied quite late into the growing season on Roundup Ready crops. This may not provide 100% control of burcucumber, but these late-season applications may reduce seed production. Applications of glyphosate can also be made on Roundup Ready Corn 2 up to 30 inches tall without drop nozzles and up to 48 inches with drop nozzles. In soybean, glyphosate can be applied through flowering (R2 soybean growth stage). Preharvest applications of glyphosate may be necessary to aid in harvest. Applications in corn can be made after black layer and in soybeans after seed set and when the pods have lost their green color; in either crop applications need to be made 7 days prior to harvest. Be sure to consider all weeds present in your field when selecting which herbicide program to use and to adhere to the label.

Tactics specific to corn. Historically, atrazine at the full use rate has been the primary recommendation for burcucumber control in corn. Any of the atrazine premixes, including Lumax, Lexar, Harness Xtra, Bicep II Magnum, Cinch ATZ, Fultime, Guardians Max, and Keystone, along with products such as BalancePro, Epic, and Callisto at full labeled rates provide a good foundation for control. Post-emergence herbicide options include atrazine, Beacon, Northstar, Marksmen, Exceed/Spirit, Callisto, glyphosate, and Liberty.

Tactics specific to soybean. Burcucumber management in soybean has to be intense: a soil-applied herbicide, post-emergence application, cultivation, and a dense soybean canopy will help. Effective preemergence herbicides for burcucumber in soybean are quite few—Canopy, Scepter, Pursuit, again at full labeled rates. Options for postemergence applications include Extreme, Sequence, Classic, Synchro-ny XP, Flexstar, Cobra, Ultra Blazer and glyphosate.—Dawn Refsell

Herbicide Updates for 2008

With the dawning of a new season of newsletter articles, we provide an overview of some changes in herbicide options available to Illinois weed control practitioners. The number of new herbicide active ingredients is limited again this year. Some of these products were actually commercially available in 2007 but were not included in the Illinois Agricultural Pest Management Handbook until the 2008 edition. This article is not intended to provide a complete summary of all label changes that have occurred, and we encourage all who use herbicides to consult respective product labels for additional information.
Authority Assist 4SC (sulfentrazone + imazethapyr) contains the active ingredients of Authority and Pursuit. Authority Assist may be applied from 45 days before soybean planting up to 3 days after planting. For preplant incorporation applications, incorporate no deeper than 2 inches. Application rates are based on soil texture and organic matter content and range from 6 to 12 fluid ounces per acre. The addition of imazethapyr will improve control of certain large-seeded species (such as common cocklebur) over that of sulfentrazone alone.

Authority MTZ 45DF (sulfentrazone + metribuzin) contains the active ingredients of Authority and Sencor. It can be applied from up to 45 days preplant until 3 days after soybean planting. Application rates range from 8 to 20 ounces per acre and are determined by soil texture and organic matter content. Authority MTZ will suppress or control several broadleaf species, particularly small-seeded species such as common lambsquarters, pigweeds, and waterhemp. Control of large-seeded broadleaf species, such as cocklebur and giant ragweed, will probably not be adequate with this product alone. Duration of weed control will generally be directly related to product application rate and timing.

Autumn 10WDG (iodosulfuron) is now labeled for applications at least 30 days before planting field corn. Do not apply Autumn prior to planting sweet corn, popcorn, or corn grown for seed. Breakfree ATZ 6.25L, and Breakfree ATZ Lite 5.5L (acetochlor + atrazine) contain the same active ingredients as Surpass, Keystone, and Keystone LA, respectively.

Distinct 70WDG (dicamba + diflufenzoxy) can be applied at 2 to 4 ounces per acre prior to soybean planting for control of existing vegetation. Following this type of application, a minimum of one inch precipitation (rainfall or overhead irrigation) and a 30-day waiting interval are required before planting soybean. These requirements must be satisfied to reduce the potential for soybean injury.

Enlite and Envive (chlorimuron + flumioxazin + thifensulfuron) are new soybean herbicide premixes from DuPont. Both products contain the same active ingredients, but the ratios are such that Enlite is better suited to northern areas and higher pH soils (i.e., less chlorimuron), while Envive will be positioned across a broader geography of Illinois. Each product can provide burndown and soil-residual control of many annual broadleaf weed species. Envive 41.3DG can be applied from prior to planting until 3 days after planting but before soybeans emerge. Application rates range from 2.5 to 5.3 ounces per acre but should not exceed 2.5 ounces for soils with a composite pH of greater than 7.0.

Halex GT 4.38CS (S-metolachlor + glyphosate + mesotrione) is a post-emergence premix for control of a broad spectrum of grass and broadleaf weed species in glyphosate-resistant corn hybrids. Halex GT can be applied at 3.6 to 4.0 pints per acre to corn from emergence up to 30 inches in height or the 8-leaf stage. Best results will often be achieved when Halex GT is applied before weeds exceed 4 inches in height. Applications must include a nonionic surfactant and ammonium sulfate. An application rate of 3.6 pints per acre provides the equivalent of 1 pint of Dual II Magnum + 3 fluid ounces of Callisto + 0.95 lb ae glyphosate. The S-metolachlor and mesotrione components may provide some level of residual weed control following application.

Laudis 3.5SC (tembotrione) is a new postemergence herbicide registered for use in field and silage corn, seed corn, sweet corn, and popcorn for control of certain annual broadleaf and grass weed species. Laudis causes whitening or bleaching in susceptible species by inhibiting 4-HPPD (the same target site as Callisto and Impact). The commercial formulation contains a safener that reduces the potential for corn injury. The application rate is 3 fluid ounces per acre when applied alone or 2 fluid ounces when tankmixed with Liberty and applied to Liberty Link corn hybrids. Atrazine (0.5 lb ai/acre) is often a preferred tankmix partner and can enhance the control of several weed species. All applications should include the appropriate spray additive(s), which is determined by choice of tankmix partner. Applications of Laudis alone or tankmixed with atrazine should include a crop oil or methylated seed oil concentrate and an ammonium nitrogen fertilizer. Broadcast applications of Laudis can be made to field corn or popcorn from emergence up to the V8 growth stage and to sweet corn from emergence up to the V7 growth stage. Do not make more than two applications of Laudis to field corn or popcorn or one application to sweet corn per growing season. University of Illinois research has shown Laudis to have activity on broadleaf species similar to Callisto and Impact and grass control better than Callisto. Fall panicum is one particular annual grass species that is very tolerant to Laudis.

SureStart 4.16SE (acetochlor + clopyralid + flumetsulam) is a premix product for use only in herbicide-tolerant field corn and silage corn. SureStart can be applied preplant (up to 30 days prior to planting) or postemergence (to corn up to 11 inches tall) at 1.5 to 2 pints per acre. The 1.5 pints per acre rate of SureStart provides the equivalent of 0.88 pint Surpass + 0.45 ounce Python + 2.32 ounces Stinger. These rates will generally provide early-season control or suppression of weeds, but plan to follow up with a timely postemergence herbicide application. SureStart was labeled in 2007, but the current growing season marks its first full season of commercialization.

Prefix 5.3EC (S-metolachlor + fomesafen) contains the active ingredients found in Dual Magnum and Reflex. This premix can be applied preplant or preplant incorporated for control of annual grass and broadleaf weed species in soybean. Application rates will vary in Illinois, ranging from a maximum of 3 pints per acre south of Interstate 70 to a maximum of 2.5 pints per...
Poor-Quality Soybean Seed

Fungicide Seed Treatments and Poor-Quality Soybean Seed

Soybean seed with lower-than-normal germination, especially in certain maturity groups, is very common this year. This low germination is apparently due to thin seed coats, which make seeds more prone to mechanical damage. I have received a few questions about how fungicide seed treatments may impact germination on these seeds. Fungicides will not increase germination of poor-quality seeds when the poor quality is due to mechanical damage. If it is due to fungal infection, fungicide seed treatments could increase germination in some cases.

Increased risk of seedling blight could be associated with planting seeds with damaged seed coats. Research conducted in the 1970s at Ohio State University indicated that the quality of soybean seedlings that emerged from seeds with cracked or scarified seed coats was poorer than of seedlings that emerged from seeds with intact seed coats. Exudation of nutrients from seed with damaged seed coats can be greater than from seed with intact seed coats. This nutrient exudation can stimulate *Pythium*, a soilborne pathogen that can cause seedling blight of soybean. For this reason, treatment with a fungicide of seed with damaged seed coats could provide some protection against *Pythium* and other soilborne pathogens that can cause seedling blight.

A confounding factor is planting date. When planting into cool soils, fungicide seed treatments may have a bigger impact than when planting into warmer soils. Under cool soil conditions, seeds germinate more slowly and may be more at risk to some *Pythium* species that do well in low temperatures. With soils presently saturated across the state and forecasts for additional rain, it is unlikely that much “early” planting will occur. Later-planted fields will likely mean planting into warmer soils, where fungicide seed treatments may not provide a benefit.

Some seed companies have recommended not treating the “poor germination” soybean seed this year because of fear of increasing mechanical damage that could happen in the treating process. In these cases, a planter box treatment could be used. If the decision is made to treat soybean seeds or to use a planter box treatment, it is important to use a product that contains either mefenoxam or metalaxyl, both of which provide specific protection against *Pythium*. In addition, the product should contain at least one other active ingredient (fluoxipyr, trifloxystrobin, carboxin, and others) that will provide protection against other pathogens.—Carl A. Bradley

CROP DEVELOPMENT

Thinking About Corn Planting Date and Population

Most of the state has wet soils at present, with no immediate indication that soils will start to dry out soon. March was generally cooler than average, and precipitation has been average to much above average over much of the state. Cool weather in March is never conducive to early drying, and cool temperatures coupled with normal rainfall mean that we may get well into April before much can happen in the fields. There may be scattered areas dry enough to allow fertilizer application. But this is a good time to remember that soil at field capacity is at its most “compactable,” and that even flotation tires can do some damage when they carry heavy equipment across soils that are wet.

Corn prices have been quite volatile, and they are likely to remain that way as we move into April with little or no planting done in Illinois. This is a good time to review planting date response to see when yield losses start to accelerate as planting is delayed. We have been conducting research for the past three years at six Illinois locations looking at both planting date and plant population responses. The data will be used to update the responses that we currently use, which are from data generated some 15 years ago at fewer locations.

In these studies, we make the first planting as early as practical without mudding the crop in. The first date has ranged from late March to mid-April. We then plant at intervals of about 3 weeks, for a total of four dates, with the last date in late May. Within each planting date we thin to stands of 20,000 plants to 40,000 or 45,000 plants per acre.

As we expected from previous experience, the effect of planting date varied considerably, with the highest yields sometimes coming from the earliest planting date and in a few cases from the third (mid-May) date. Much of
this is due to the rainfall pattern over the entire season, with good rainfall throughout the summer usually meaning highest yields from the earliest plantings. Dry weather in June and early July followed by good rainfall might give an advantage to the third planting. The late May planting has never produced the best yields, because plants that start that late cannot utilize the whole growing season effectively.

We combine data from sites over years to predict effects of planting date on yield. These estimates are the best we have, but they are fuzzy, with the yield from one planting date at a particular location often not very close to the response line based on all the data. For example, dry weather reduced yields considerably at Perry (Pike County) in two of the three years. We combined the data from Perry and Urbana to make the central Illinois response curve, but the curve doesn’t fit the data very well in a particular sense, even though it is the average and so the best prediction we’ve got. In other words, we expect the next trials at these locations to differ from the “average.”

At both Monmouth and Urbana, the earliest planting in 2005 was destroyed by the frost the first week of April. The crop was emerged at DeKalb that year as well but was smaller, and it grew back normally. At Monmouth, the stand was completely destroyed, while at Urbana at least half of the plants were killed. Frost that late is unusual, but we also observed that having the growing point underground does not guarantee survival of V2 to V3 corn plants when temperatures dip into the 20s. Most fields that were planted in early April in the northern part of western Illinois that year had to be replanted. The rarity of this type of event means that it probably should not have a lot of influence in altering planting date. We did delete the data from that planting date for these two locations, since including low or zero yields is not realistic when such fields would clearly need to be replanted.

Figure 1 gives the planting date response curves for northern Illinois (Monmouth and DeKalb), central Illinois (Urbana and Perry), and southern Illinois (Brownstown and Dixon Springs) over the three years. We used the same hybrid for the northern and central locations and a later-maturing one in the southern locations. There was no problem with the crop from any of the latest planting dates maturing before frost, though some of the latest plantings might have had more insect or disease pressure than earlier ones.

The responses shown in Figure 1 are converted to numbers in Table 1, with average yields and average losses in yield per day of delay during each 10-day period from early April to early June. The data show that yield losses do not approach 1 bushel per day until at least 20 days after the optimum planting date, and that planting during the first week of May is expected to yield only 6 to 10 bushels less than planting on the optimum date in central and northern Illinois. Delays in planting tend to be more costly in yield in southern Illinois, where planting the first week of May is a month past the optimum date and brings a yield penalty of about 17 bushels per acre. Still, good yields are certainly possible when planting is delayed, and planting two weeks after the optimum date might well produce higher yields than planting into cool, wet, compacted soils closer to the optimum date.

Negative yield “losses” for the periods in early April mean that yield actually

![Figure 1. Planting date responses averaged over two sites and three years for each of three Illinois regions.](image)

<table>
<thead>
<tr>
<th></th>
<th>Northern Illinois</th>
<th>Central Illinois</th>
<th>Southern Illinois</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period</td>
<td>Avg yield (bu/A)</td>
<td>Loss/day (bu/A)</td>
<td>Avg yield (bu/A)</td>
</tr>
<tr>
<td>Apr 1–10</td>
<td>224.8</td>
<td>-0.6</td>
<td>164.3</td>
</tr>
<tr>
<td>Apr 11–20</td>
<td>227.8</td>
<td>0.0</td>
<td>166.4</td>
</tr>
<tr>
<td>Apr 21–30</td>
<td>225.2</td>
<td>0.5</td>
<td>165.1</td>
</tr>
<tr>
<td>May 1–10</td>
<td>217.0</td>
<td>1.1</td>
<td>160.2</td>
</tr>
<tr>
<td>May 11–20</td>
<td>203.2</td>
<td>1.7</td>
<td>151.8</td>
</tr>
<tr>
<td>May 21–31</td>
<td>182.5</td>
<td>2.5</td>
<td>139.1</td>
</tr>
<tr>
<td>June 1–10</td>
<td>155.9</td>
<td>2.8</td>
<td>122.7</td>
</tr>
</tbody>
</table>

Data are averaged over three years (2005–07) and over three plant populations (25,000, 30,000 and 35,000 per acre).
increases as planting is delayed during that period, because the “best” planting date is later than this. Such yield penalties for planting very early are typically not large, but they are common—of 16 site-years (not counting Urbana and Monmouth in 2005 when the first planting failed), the earliest planting yielded more than the second one eight times, the second planting yielded more than the first seven times, and at one site there was no difference. When the weather is consistently warm after the first planting emerges, early planting tends to do best, but if cool or cold temperatures occur after corn has passed the 2- or 3-leaf stage (this would most commonly be the largest, earliest-planted corn), we think there can be temperature-related damage that affects the yield potential. In 2006 at Urbana, where the first planting yielded almost 40 bushels per acre less than the second planting, there was a period in mid-May during which high temperatures averaged less than 50 degrees. We do not know how or where such damage occurs in corn plants.

Plant population. As I have described, this series of trials has included a range of plant populations established by thinning to stand within each planting date. While we found interactions between planting date and plant population at a number of site-years, they were not consistent enough to tell us that plant population ought to be changed depending on when we plant. It might be good to raise seed drop rates slightly when planting early to compensate for lower expected emergence, but if soil conditions are good, this may not be necessary. It is normal to drop 5% to 10% more seed than the desired final stand, with the lower end of this range appropriate if seed quality and soil conditions are good.

Figure 2 shows yield response to plant population averaged over nine northern Illinois locations (DeKalb, Monmouth, and Urbana) and averaged over three southern Illinois locations (Perry, Brownstown, Dixon Springs). Data were averaged over the first three planting dates in each trial. Perry is in southwestern Illinois, of course, but it has had yields lowered by dry weather in recent years and has soils similar to other areas in southwestern Illinois, so yields and responses were similar to those in the southern locations. The data from northern locations show increasing yield up to a population of about 37,000 plants per acre, while in southern Illinois yields increased only up to 27,000 plants per acre. There was little or no yield increase at populations above that at the highest yield level.

This reinforces an important feature of modern hybrids: yields tend to level off, not drop off, at populations above the point of maximum yield. From a risk management standpoint, this means that it tends to be prudent to plant higher populations to take advantage of good conditions, since the only loss under average or poor conditions is the additional seed cost.

The large increases in both corn price and seed costs in the past year raise questions about using economics to set appropriate plant populations. Table 2 shows the effect of changing corn and seed prices on optimum harvest population based on the northern Illinois response data shown in Figure 2. When corn is bringing $5 a bushel, the economically optimum population drops by about 1,200 plants per acre when the seed cost doubles from $120 to $240 per unit. In practice, such changes should be moderated somewhat by the point made above, that the economic risk of having populations too low for good conditions tend to be greater than the risk of having them too high, even when seed is expensive.

For those who remain conservative on plant populations, the data show that yield losses when populations are 3,000 to 5,000 less than optimum tend to be relatively small. But with less need to make sure populations are not too high, the potential benefit from maintaining lower populations, other than direct savings in seed costs, is also small. —Emerson Nafziger

Table 2. Optimum harvest populations with different corn and seed prices based on population responses over 9 northern Illinois trials.

<table>
<thead>
<tr>
<th>Seed cost ($/Unit)</th>
<th>Optimum harvest population at price per bushel</th>
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<tbody>
<tr>
<td>$4</td>
<td>36,200</td>
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<tr>
<td>$5</td>
<td>36,400</td>
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<td>$6</td>
<td>36,500</td>
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<td>80</td>
<td>35,700</td>
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<td>120</td>
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<td>160</td>
<td>35,600</td>
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<tr>
<td>200</td>
<td>35,200</td>
</tr>
<tr>
<td>240</td>
<td>35,000</td>
</tr>
</tbody>
</table>

A unit of seed is 80,000 kernels. Calculations do not include planting extra seed to establish indicated populations.
REGIONAL REPORTS

East-Central Illinois

Rainfall for March ranged from 5 to 10 inches across east-central Illinois, with the amounts increasing from northwest to southeast. More important than the number of inches is the fact that we have been receiving enough rain to keep soils in near-saturated conditions. To date, no spring fieldwork has occurred. Wheat and alfalfa fields are starting to green up.

Northern Illinois

Widespread precipitation occurred throughout the region on March 31. Present soil moisture and predicted cool temperatures will prevent any immediate fieldwork. Very limited oat and alfalfa seeding have occurred this spring. To date, wheat appears to have survived the winter, but many fields have not reached “100% greenup” by April 1 due to the continued below-average temperatures. Some wheat fields have yet to have nitrogen applied this spring. Several reports indicate that alfalfa north of Route 30 has not broken winter dormancy.

Extension educators throughout the region will be moderating black cutworm moth traps this spring. Moth catch results will be shared in future issues.

Southern Illinois

Continued heavy rainfall during the past week has added insult to injury in already soggy fields in the south. No fieldwork has been done up to this point, and the 10-day forecast does not predict any opportunities for improvement. Although it is too early to panic, some growers are already questioning whether there will be a greater shift from corn to soybean if delays continue much longer. If fieldwork is delayed until mid-April, there will be temptation to try to “open up” fields with shallow tillage to get the seedbed dried out. With wet subsoil conditions, this will greatly increase the potential for soil compaction and lead to even greater problems later in the summer.

Because of cool growing conditions, wheat appears to be about a week behind what it has been for the past couple of years; it is now at Feeke’s Stage 5. Fields with good surface and/or internal drainage appear to be handling the wet conditions well and have good color and growth. Flat, poorly drained fields are beginning to show severe damage in areas where water has ponded. Any wheat planted in river and creek bottoms is pretty much gone.

West-Central Illinois

There were a few fields of oats seeded along with some other forages early last week on the better drained soils, prior to the rains arriving. Some dry fertilizer applications were also made in selected fields for corn or soybean crops.

Wheat continues to improve in color. Most wheat fields look very good.

Grass pastures are not yet showing much growth. Greenup of alfalfa began several weeks ago but has not progressed much.

Producers are waiting — impatiently — for warmer, drier weather.