PEST MANAGEMENT & CROP DEVELOPMENT

BULLETIN

FOR IMMEDIATE RELEASE
No. 5 / April 25, 2003

Executive editor: Kevin Steffey, Extension Entomologist

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INSECTS

Cutworms Continue Their Move Across Illinois

With help from last week's southerly winds, black cutworm moths are now being found in pheromone traps more frequently across the state. Reports of intense captures are increasing, and moths are being observed for the first time in many counties. Counties reporting moth catches for the first time include Dekalb, Grundy, Lee, Ogle, Piatt, Stephenson, Whiteside, Will, and Winnebago. Intense captures (nine or more moths captured in a 1- to 2-day period) have been reported in several counties:

Matt Montgomery, Sangamon/Menard Extension unit educator in crop systems, is working with several cooperators in the Sangamon/Menard area who reported intense captures last week, including Jeff Harbour (20 moths on April 16), Jeff Libe (12 moths on April 16 and 17), Matt Dambacher (12 moths on April 17), and Vito Stallone (10 moths on April 19).

Sean Evans, Extension educator in crop systems at the Macomb Extension Center, captured 9 and 15 moths on April 17 and 18, respectively, in his trap in Macomb.

Marc Rigg, with the Good Hope Pioneer Production Plant, captured 9 and 12 moths on April 16–17 and April 20, respectively, in Mason County.

Mike Christenson, Stephenson Service Company, reported 11 moths on April 20.

Jeff Staley, Wabash Valley FS, continues to report intense captures in Gallatin County. Ron Hines reports in the Hine Report (http://www.ipm.uiuc.edu/pubs/hines_report/index.html) the presence of black cutworm moths in Massac, Pope, and Pulaski counties, although no intense captures occurred last week.

We can predict the first dates of larval cutting activity based on the dates of intense captures (Table 1). These dates suggest when cutting may begin to occur and should be used as a guideline for scouting cornfields.

When scouting for cutworms, check fields for leaf feeding, cutting, wilting, and missing plants every 3 to 4 days. Feeding damage may be missed if you scout only once per week, especially if temperatures have been high and cutworm larvae are developing rapidly. Examine a minimum of 250 plants (50 plants in each of 5 locations) in a field. When injured plants are found,

Table 1. Projected dates of cutting by black cutworm larvae (fourth instars) based upon accumulation of 300 degree-days (base 50°F) after dates of "intense captures" of black cutworm moths (projections provided by Bob Scott, Illinois State Water Survey).

Date of intense capture	*Location*	*Projected date of cutting*
April 5	Gallatin County	May 4
April 7	Pulaski County	May 4
April 11–12	Adams/Brown County	May 8
April 16	Sangamon/Menard County	May 15
April 16–17	Mason County	May 19

dig around the bases of the plants to look for live cutworms. Several species of cutworms feed on corn. Pictures of their larvae may be found in *Integrated Crop Management* with photos by Marlin Rice (Extension entomologist at Iowa State University); (http://www.ipm.iastate.edu/ipm/icm/ 2000/5-8-2000 cutworm2000.html).

When you find cutworms, determine the average instar (stage of larval development) of a sample to estimate how much longer the larvae will feed. For example, if most of the cutworms are fourth instars, the larvae will feed for approximately 25 days if the average temperature is 70˚F. The best way to determine the instar of a black cutworm larva is to use a head-capsule gauge. The width of a cutworm's head capsule increases as it molts from one instar to the next. To use the head-capsule gauge, grasp a cutworm larva tightly behind the head and squeeze (gently) to force the head forward. Hold the head flat against the gauge, first at the top of the scale (fourth instar). Move the head down the scale until the width of the head matches the width of the bar. The number corresponding to that bar is the instar of the cutworm. Based on the instar, you can determine the approximate days left to feed and the potential number of 1-leaf, 2-leaf, or 4-leaf plants that will be cut. Cutworm larvae will cut more 1-leaf-stage plants than 4-leaf-stage plants.

As the corn planting season continues, black cutworm season will also get under way. Please keep us posted on any findings.—*Kelly Cook*

Few Reports of Alfalfa Weevils

In contrast to last spring at this time, we've received a small number of reports on alfalfa weevil activity this spring. In fact, most reports indicate very few alfalfa weevils are out in fields. Nevertheless, the watch for alfalfa weevils should continue.

Figure 1 indicates the accumulated degree-days (base 48˚F), from January 1 to April 21, 2003. Figure 2 projects the accumulated degree-days (base 48˚F), from January 1 through May 6, 2003. The first peak of third-instar weevils occurs after the accumulation of 325 degree-days. Currently, the southern portion of Illinois has already reached that benchmark, and 325 degree-days will have accumulated in nearly all of Illinois by May 6. Remember, a second major peak of third-stage larvae occurs after the accumulation of 575 degree-days.

As degree-days continue to build, continue scouting fields for alfalfa weevils and symptoms of injury. We'll keep you posted on any developments.—*Kelly Cook*

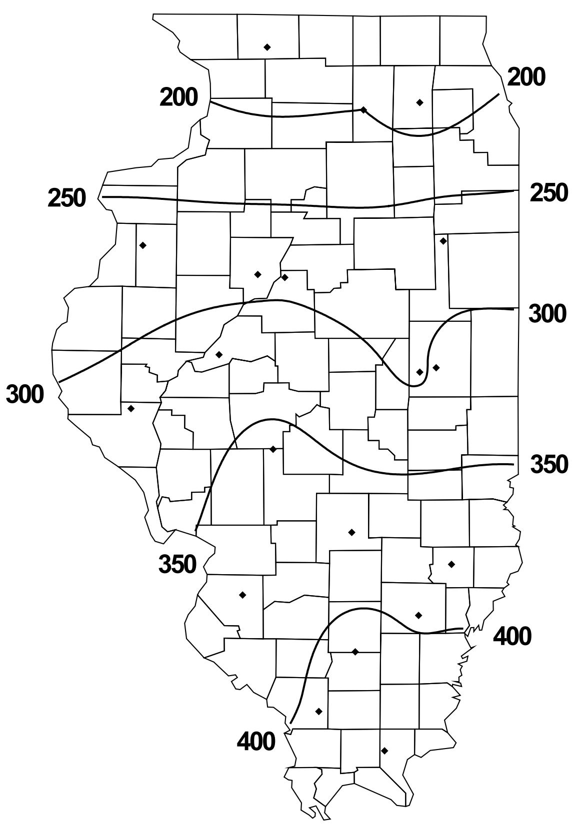

Figure 1. Actual degree-day accumulations (base 48˚F) from January 1 through April 21, 2003. (Map courtesy of Bob Scott, Illinois State Water Survey.)

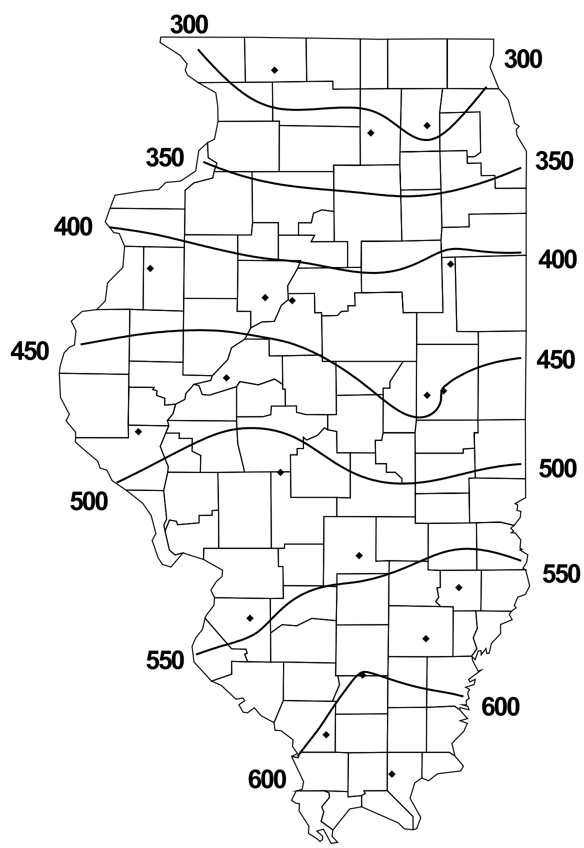

Figure 2. Projected degree-day accumulations (base 48˚F) from January 1 through May 6, 2003. (Map courtesy of Bob Scott, Illinois State Water Survey.)

Corn Flea Beetle Spotting

As discussed in issue no.1 of the *Bulletin*, corn flea beetle activity was expected to be low in much of Illinois; southern Illinois generally has mild enough winters to allow survival of the corn flea beetle. With that in mind, it is always important to keep an eye out on seedling corn.

Kevin Black, with Growmark in Bloomington, shared a report from Alan Mosler, seed sales agronomist at Southern FS, who found 8 to 10 flea beetles per seedling corn plant on 2-leaf-stage corn in Franklin County.

Flea beetles overwinter as adults and become active when spring temperatures increase to 65˚ to 70˚F. Although they prefer to feed on corn, flea beetles will also feed on several other hosts, including orchard grass, Kentucky bluegrass, fall panicum, crabgrass, redtop, witchgrass, foxtail, Sudan grass, barley, and wheat. As corn begins to emerge in the spring, they move from these secondary hosts to cornfields. When scouting seedling corn, look for corn flea beetles and symptoms of the injury they cause. Feeding appears as scratches on the corn leaves and rarely causes economic damage unless densities are very high. Corn flea beetles also transmit the bacterium *Erwinia stewartii*, which causes Stewart's wilt. Seedling corn infected by Stewart's wilt may have yellow, linear lesions on the leaves, become stunted, and wilt.

Sweet corn hybrids and seed corn inbreds are more susceptible than most dent corn hybrids to flea beetle injury and Stewart's wilt. Most commercial field corn hybrids are resistant to the wilt phase of Stewart's wilt after they develop beyond the 5-leaf stage. Although some hybrids remain somewhat susceptible to the leaf blight phase of Stewart's wilt, it does not occur at or after tasseling in dent corn. Treatment of seedling corn plants is recommended only when seedlings are severely damaged and plants are being killed. Insecticide recommendations for rescue treatments may be found in the *Illinois Agronomy Handbook* (http://web.aces.uiuc.edu/aim/IAH/ch18/).—*Kelly Cook*

Influence of Agricultural Practices on Earthworm Populations

During the 2003 Crop Protection Technology Conference, Eileen Kladivko, professor in the Department of Agronomy at Purdue University, presented some very interesting facts concerning the influence of agricultural practices on earthworm populations. We frequently receive many inquiries each year about this topic, so I will attempt to summarize some of Kladivko's key points on this subject.

Typically, one to five "shallow-dwelling" species and one "deep-burrowing" species of earthworms exist in agricultural fields. Nightcrawlers belong to the deep burrower category. They create vertical burrows that may be 5 to 6 feet in depth. Nightcrawlers collect plant residue and pull it into their burrows. *Lumbricus terrestris* is the common nightcrawler species in the north region of the United States and may reach a length of 4 to 8 inches. Nightcrawlers are generally more active in the spring and fall when the soil temperatures are cooler and the soil moisture is more favorable to their survival. As soil temperatures increase and the soil becomes drier, nightcrawlers can move to greater depths in their soil burrows.

Other earthworms that inhabit agricultural fields include the shallow-dwelling worms (redworms, grayworms, fishworms). These species are found most often in the upper 12 inches of the soil. They are smaller than nightcrawlers, reaching lengths of 3 to 5 inches. Unlike nightcrawlers, they do not build permanent burrows. Instead they tunnel throughout the upper 1 foot of soil ingesting plant debris. They do not require plant residue at the surface of the soil, and in this regard they also differ from nightcrawlers. Peak activity for the shallow-dwelling worms is spring and fall. During the summer and winter, they enter into a resting state. This is accomplished by moving more deeply into the soil (1 1/2 feet) and encasing themselves in a mucous secretion.

Kladivko indicated that the importance of earthworms in the maintenance of soil productivity varies according to circumstance. Some soils are considered very productive even without earthworms. However, earthworms are generally believed to improve both soil structure and tilth. Because of their tunneling activities, they create soil channels that can improve water and airflow movement throughout the soil profile, enhancing root development. In addition, earthworm casts (worm feces) have elevated available nutrients, as compared with the surrounding soil. The mixing of organic matter and soil nutrients by earthworms is likely to be especially beneficial in no-till production systems.

Kladivko measured earthworm densities on silty clay loam fields near West Lafayette, Indiana, that had been devoted to various agricultural production systems for at least 10 years. The densities of earthworm populations were as follows:

Continuous corn, plowed—10 earthworms per square meter

Continuous corn, no-till—20 earthworms per square meter

Continuous soybean, plowed—60 earthworms per square meter

Continuous soybean, no-till—140 earthworms per square meter

Bluegrass–clover—400 earthworms per square meter

Dairy pasture, manure—340 earthworms per square meter

Dairy pasture, manure (heavy)—1,300 earthworms per square meter

These results substantiate that continuous production of a crop and tillage had negative impacts on earthworm densities. Kladivko reported that other surveys indicate that no-till production systems most often lead to increases in earthworm densities. She reported that 8 of 14 sites had greater densities of earthworms in no-till production systems. In some instances, densities of earthworms in no-till fields were 10 times as great.

What effect do agricultural chemicals have on earthworm populations? The following quotes are taken directly from Kladivko's paper that she delivered at the Crop Protection Technology Conference in January 2003.

Fertilizer applications. "Inorganic nitrogen fertilizers promote greater plant production than in unfertilized fields and therefore higher earthworm populations. Although anhydrous ammonia kills a few worms in the narrow band where injected, field effects are probably minimal due to the small area affected. There is little information on other nitrogen sources commonly used in the Midwest, but effects are probably small when used at typical field rates."

Herbicide applications. "Most herbicides used in crop production in the Midwest are harmless or only slightly toxic to worms and should not be a great concern."

Insecticide applications. " … some corn rootworm insecticides are toxic to worms, but their effects can be reduced by keeping the application band as narrow as possible. In general, the organophosphate and pyrethroid insecticides are harmless to moderately toxic, whereas the carbamate insecticides and fungicides are highly toxic. Nematicides in general are also highly toxic."

Hopefully, this summary will provide answers for many of the questions we receive each growing season regarding the impact of agricultural practices on earthworm populations. Kladivko's complete proceedings paper can be found on pages 56–61 in the *Proceedings of the Crop Protection Technology Conference*, January 7–8, 2003, University of Illinois.—*Mike Gray*

WEEDS

Identifying Early-Season Weed Species

They're back again in 2003—those early-season weeds in no-till fields that are sometimes difficult to identify. The following article appeared in the 2002 edition of the *Bulletin*, and we have decided to rerun it. We hope it will be useful as you attempt to identify some of these species.

After the article appeared last year, several people contacted us to ask whether color photographs of the weed species were available in a format that could be taken to the field. Last year they were not, but this year they are. With funding provided by the Illinois Soybean Program Operating Board, we have produced *A Pocket Identification Guide of Early-Season Weed Species*. This guide includes many of the color photographs in the Web version of this article, along with brief text describing distinguishing characteristics for each of the 19 species. The guide easily fits in a shirt pocket, so it can go with you to the field. Guides are available for $3 per copy and can be ordered by contacting me, Dr. Sprague, or Mrs. Kris Ritter by phone (333-4424) or e-mail. Best wishes for successful weed identification!

The warm weather during the week of April 14 encouraged the growth of many weed species in no-till fields. Trying to figure out what some of these early-season weed species are can be difficult, so we thought a short review on identification would be beneficial. For readers with access to the Web version of the *Bulletin*, color photographs accompany the description of many species.

Several weed species in the mustard (Brassicaceae) plant family are commonly found in Illinois. Members of this family have either white or yellow flowers, and the flowers consist of four petals that form a cross. Although this family contains many species, some of the more common members found in no-till fields are wild mustard *(Brassica kaber)* and yellow rocket *(Barbarea vulgaris)*, field pennycress *(Thlaspi arvense)*, Shepherd's-purse *(Capsella bursa-pastoris)*, and the pepperweeds (Virginia and field).

Two members of the smartweed (Polygonaceae) family that emerge during the early spring are Pennsylvania smartweed *(Polygonum pensylvanicum)* and prostrate knotweed *(Polygonum aviculare)*. Both species (as well as most members of the Polygonaceae family) have swollen nodes (the genus name *Polygonum* means "many knees") covered with a membranous sheath, called an ocrea. Look closely where the leaf petioles join the main stem. Ladysthumb (*Polygonum persicaria* L.) is very similar in appearance to Pennsylvania smartweed, and the two can be distinguished from one another during early vegetative growth by examining the ocrea. Ladysthumb has a fringe of hairs at the top of the ocrea, whereas Pennsylvania smartweed does not.

Two species of chickweed are commonly found in Illinois. Common chickweed *(Stellaria media)* exists primarily as a winter annual but may sometimes emerge in the early spring. Mouseear chickweed *(Cerastium vulgatum)* is a perennial species and is generally not as abundant in no-till fields as common chickweed. Both species are similar in appearance. However, mouseear chickweed is covered with dense hairs on the leaf and stem surfaces, while common chickweed plants lack hairs. These species (especially common chickweed) can form very dense "mats" of vegetation that can make tillage and planting operations difficult. Chickweed flowers consist of five petals that are white and deeply lobed, giving the appearance of 10 petals .

Henbit *(Lamium amplexicaule)* and purple deadnettle *(L. purpureum)* are close relatives; both exist as winter annuals and both have square stems. Henbit is more commonly found throughout Illinois, while purple deadnettle appears more often in the southern half of the state. The lower leaves of henbit are petiolate (attached to the stem with petioles), while the upper leaves grasp the stem (i.e., lack petioles). The upper leaves of purple deadnettle, however, are attached to the stem with petioles, are more triangular than those of henbit, and are less deeply lobed. As the name implies, purple deadnettle has a distinctive reddish to purple coloration of the foliage and stem.

Another species with a bright yellow flower is butterweed *(Packera glabella)*, also referred to as cressleaf groundsel. Although the yellow flowers may lead you to think butterweed is a mustard, this species actually belongs to the Asteraceae family. Butterweed has a hollow stem that can be either green or bright red in color.

Kochia *(Kochia scoparia)* is an early-emerging summer annual species. It is a herbaceous dicot and member of the Chenopodiaceae family (the same botanical family as common lambsquarters). Kochia leaves are alternate, with simple blades that are highly pubescent. Stems are erect, highly branched, often grooved on older plants, and vary in color from green to red, often with both colors present on an individual plant. Kochia was introduced into North America from Europe as an ornamental because of its red color in late summer and fall (hence kochia's other common name, "fireweed").

Horseweed *(Conyza canadensis)*, or marestail, is a winter or early-summer annual species. Seedlings develop a basal rosette of leaves, and the leaves are covered with short hairs and have toothed margins. Control of this species with burndown herbicides can be difficult, especially if applications are made under cool conditions or without 2,4-D. Recent reports have identified biotypes of horseweed that are resistant to glyphosate in several states, including Indiana and Tennessee.

A species that is not as common as others described here, but that can be difficult to manage with burndown herbicides, is star-of-Bethlehem *(Ornithogalum umbellatum)*. This species is a bulbous perennial that is frequently sold as an early-flowering ornamental but has escaped into agricultural fields. All parts of the plant are poisonous if ingested. Emerging star-of-Bethlehem shoots resemble wild garlic or wild onion but lack the characteristic odor of these species. The mature leaves are dark green and frequently have a prominent white midrib. Plants typically produce bright white flowers beginning in early to mid-May, then die back for the remainder of the season.

Poison hemlock *(Conium maculatum)* is a biennial species commonly found in pastures and along railroad rights-of-way but becoming more common in no-till fields. During its first year of growth, poison hemlock forms a rosette (a dense cluster of leaves growing close to the ground), then bolts to produce seed during its second year. The leaves are alternate, four to five times compound, and toothed, giving the leaves a "lacy" appearance. The stems are smooth and hollow, with purplish spots or blotches. The entire plant is poisonous.

Dandelion *(Taraxacum officinale)* is a simple perennial species that forms a large, often deeply rooted, taproot. Leaves have irregular margins, are often deeply lobed, and form a basal rosette. The flower is large and yellow. 2,4-D is often used for burndown control of dandelion, but control is generally more complete and consistent when 2,4-D is applied in the fall.

Prickly lettuce *(Lactuca serriola)* can exist as a winter or early-summer annual. Leaves on young plants are long and tapered at the end, with margins that are finely toothed. A row of prickles can be found along the midrib on the underside of the leaf. A milky juice is present in leaves, stems, and roots.

Several species of buttercup *(Ranunculus* species*)* exist in Illinois, but one that appears to be very common is smallflower buttercup *(Ranunculus abortivus)*. The lower leaves are generally broad and rounded, bright green in color with toothed margins, and borne on a long petiole. Upper leaves are borne on short petioles and deeply lobed (generally three to five lobes). Flowers have yellow petals, with seeds contained in a structure known as an achene.

Other weed species that you might find in no-till fields include speedwells *(Veronica* species*)*, annual bluegrass *(Poa annua)*, catchweed bedstraw *(Galium aparine)*, and plantains.—*Aaron Hager and Christy Sprague*

Burndown Considerations for 2003

The decreased use of soil residual herbicides in soybean, coupled with several recent "mild" winters, has caused some changes in the weed spectrum across much of Illinois. One change that is very noticeable at this time of year is the amount of weed vegetation present in no-till fields. Compared with 10 years ago, existing vegetation to be dealt with prior to planting is often more dense and composed of species not familiar to everyone. When air and soil temperatures begin to increase, expect these weeds to grow rapidly.

Much of this existing vegetation consists of winter annual weed species, such as chickweed, henbit, and purple deadnettle. These species generally emerge in the fall and overwinter, but sometimes (depending on weather and soil moisture conditions) these species emerge in the early months of the calendar year. Some early-emerging summer annual species, such as prostrate knotweed, kochia, common lambsquarters, and giant ragweed, will soon make their presence known as well. This "mat" of vegetation can cause significant problems with planting operations and crop establishment if not properly controlled. In most situations, producers should attempt to control existing vegetation prior to planting no-till corn or soybeans.

2,4-D is frequently used in a burndown tank mix prior to corn or soybean planting. The ester formulation is usually preferred over the amine formulation since its waiting interval between application and planting is generally less. The labels of many 2,4-D ester formulations (3.8 pounds of acid equivalent per gallon) allow applications of up to 1 pint per acre 7 days prior to soybean planting; increasing the rate to more than 1 pint increases the waiting interval to 30 days. Keep in mind that some 2,4-D ester formulation labels also specify a waiting interval between application and corn planting (for example, 7 days for up to 1 pint, 14 days for rates between 1 and 2 pints). In addition to waiting intervals, labels sometimes also indicate that tillage operations should not be performed for at least 7 days after application and that the seed furrow must be completely closed during the planting operation or severe crop injury may result. Certain labels also recommend that applications should be made 7 to 14 days before corn planting or 3 to 5 days after planting before the corn has emerged. Factors that increase the likelihood of the 2,4-D coming in direct contact with the crop seed increase the probability of severe crop injury.

Several soil-applied herbicides used in corn and soybeans have both soil and foliar activity. This foliar activity can provide some control of small annual weeds. In corn, products such as atrazine and Balance PRO or premixes containing these herbicides can provide control of small weeds. In soybeans, products such as metribuzin (Sencor in Canopy, Boundary, Axiom, and Domain), Canopy XL, Authority, Valor, Extreme, and Backdraft SL all have foliar activity and can be applied prior to planting.

Keep in mind that most of these herbicides work best on small annual weeds and when applied with a crop oil concentrate or liquid nitrogen solution (consult the respective product label for additive recommendations). If existing vegetation is larger than 2 to 3 inches, adding another herbicide to the tank can often improve burndown activity. Gramoxone Max and glyphosate have foliar activity but lack any soil residual activity. These herbicides are often tank-mixed with corn or soybean preplant herbicides to improve control of existing vegetation.

Cool temperatures can slow the activity of many burndown herbicides, and translocated herbicides are often more slow acting than contact herbicides under these conditions. For more information on the effect of temperature on burndown herbicide activity, see the accompanying article.

Table 2 is reproduced from the *2003 Illinois Agricultural Pest Management Handbook*. The table includes weed control ratings for several corn and soybean herbicides used to burndown existing vegetation prior to planting.—*Aaron Hager and Christy Sprague*

Temperature Effects on Burndown Herbicide Activity

When is the air temperature too cold to apply a burndown herbicide? Each year we receive a number of phone calls that ask this question. With the recent temperature swings, it is hard to pinpoint when would be the best time to apply a burndown herbicide. In spring 2002, we initiated an experiment to address this question. We wanted, first, to determine the effect of air temperature during herbicide application on control of winter annual weeds and, second, to compare control of these winter annuals from herbicide treatments that had differing “speeds” of activity.

Three herbicide treatments, glyphosate (Roundup UltraMax), paraquat (Gramoxone Max), and paraquat (Gramoxone Max) plus metribuzin (Sencor), were applied at six different application timings based on daytime high air temperatures ranging from 47˚ to 87˚F. The herbicides included one herbicide that was systemic in nature (glyphosate), one that was contact in nature (paraquat), and a contact herbicide combined with a herbicide that had soil residual activity (paraquat + metribuzin). Weeds evaluated included common chickweed and henbit. Overall, temperature did not affect common chickweed control with glyphosate and paraquat plus metribuzin. However, temperature had a significant impact on common chickweed control with paraquat; control increased as temperature increased (Figure 3). Conversely, temperature greatly affected henbit control, which was less than 80% with all herbicides until applications were made when temperatures were above 76˚F (Figure 4).

Overall, increases in temperature significantly enhanced weed control and reduced weed biomass. The treatment least affected by temperature was paraquat plus metribuzin. This may be attributed to the soil residual activity of metribuzin. Some weed control provided by this treatment at lower temperatures may have come from this residual activity. Differences also appear to exist in how application temperature affects control of these two species. Temperature had little affect on common chickweed control with glyphosate; however, application temperature significantly affected glyphosate activity on henbit. So when deciding whether it is too cold to spray, make sure to consider what weeds are out there and what type of herbicide you will be using. This research was funded by the Illinois Soybean Program Operating Board.—*Christy Sprague and Aaron Hager*

CROP DEVELOPMENT

Watching Corn Emerge

Watching corn emerge is at least as exciting as watching paint dry, and the economic consequences are almost always greater. At few times during the season is the question about the future potential of the corn crop as clearly drawn as it is at emergence: Low stands simply do not yield up to potential, and even complete stands that have uneven plant size early in the season will not produce maximum yields.

Table 2. Control ratings for herbicides to control existing vegetation in no-till corn and soybean.

		Winter annual grasses							Winter annual broadleaves				Summer annuals					Perennials			
Herbicide	Crop[a]	barley, little	bluegrass, annual	brome, downy	ryegrass, annual	rye or wheat cover	chickweed, common	henbit/purple deadnettle	horseweed (marestail)	mustards	prickly lettuce	foxtail, giant	fleabane, daisy or annual	lambsquarters, common	ragweed, common	ragweed, giant	smartweed, Pennsylvania	alfalfa	dandelion, common	clover, red	vetch, hairy
Balance PRO	C	—	—	6	—	5	8	6	7	8	8	8	—	8	8	6	8	0	0	6	0
Balance PRO + atrazine	C	—	8	7	6	6	9	8	9	8	9	8	7	9	9	9	9	4	6	6	7
2,4-D ester[b]	C&S	0	0	0	0	0	5	5	8	9	8	0	6	9	9	8	7	6	8	8	9
Clarity, Banvel[c]	C&S	0	0	0	0	0	9	7	7	7	9	0	8	9	9	9	9	8	9	7	9
2,4-D + Clarity or Banvel[b,c]	C&S	0	0	0	0	0	8	6	8	9	9	0	8	9	9	9	8	8	9	8	9
2,4-D + glyphosate[b]	C&S	9	9	9	9	9	9	9	9	9	9	9	6	9	9	9	8	6	8	8	8
glyphosate[d]	C&S	9	9	9	9	8	9	7	7	8	7	9	5	8	7	8	7	5	6	5	6
glyphosate[e]	C&S	9	9	9	9	9	9	9	8	9	8	9	6	9	9	9	8	6	7	7	7
FieldMaster	C	9	9	9	9	9	9	9	8	9	9	9	7	9	9	8	9	6	7	7	4
Gramoxone Max	C&S	7	9	7	7	6	9	8	6	7	6	8	5	8	8	7	6	3	6	4	7
Gramoxone Max + atrazine	C	9	9	8	8	8	9	9	9	9	9	9	7	9	9	9	9	4	7	6	8
atrazine	C	9	9	7	6	6	9	9	8	9	9	7	7	9	9	9	9	4	6	4	7
Marksman	C	9	9	8	5	5	9	9	9	9	9	5	6	9	9	9	9	8	9	7	9
Sencor	C&S	8	—	7	5	4	9	8	6	8	8	5	—	7	7	6	8	3	5	6	5
Canopy	S	7	—	3	7	—	8	8	8	9	9	5	—	9	9	8	9	4	5	7	5
Canopy XL	S	4	4	—	6	—	7	8	8	9	9	6	—	9	9	8	9	3	4	6	6
Authority	S	4	—	—	—	0	—	6	0	—	—	6	—	8	5	5	7	3	0	0	0
Authority + 2,4-D[b]	S	4	—	—	—	0	—	6	8	9	8	6	—	9	9	8	7	6	8	8	9
Valor	S	—	—	—	0	—	9	7	0	8	0	0	—	8	5	5	0	0	0	0	0
Extreme	S	9	9	9	9	9	9	8+	7+	9	7+	9	—	9	9	9	9	6	7	7	7
Backdraft SL	S	9	9	9	9	9	9	9	7+	9	8	9	—	9	9	9	8	6	7	7	7

9 = excellent, **8** = good, 7 = fair, 6 = poor, <5 = unsatisfactory, — = no information available

[a]Labeled for burndown applications in corn (C) or soybean (S).

[b]Soybean herbicide applications require a 7-day interval between planting and application for 1 pt or less and a 30-day interval
for applications of 1 to 2 pt or more.

[c]Soybean herbicide applications require a 14-day interval between planting and application for 8 fl oz or less and a 28-day interval for applications of 8 to 16 fl oz or more.

[d]Glyphosate rate 0.375 lb a.e. (see Table 8 for a listing of glyphosate formulations).

[e]Glyphosate rate 0.75 lb a.e.

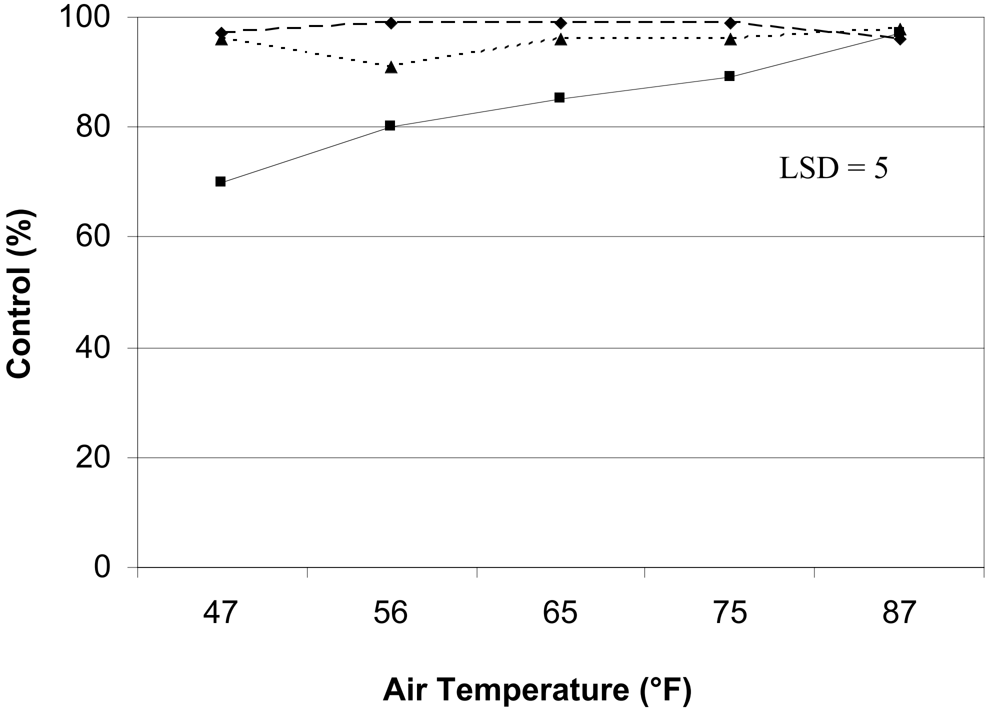

Figure 3. Air temperature effects on common chickweed control 14 (DAT). Roundup Ultra Max (◆), Gramoxone Max (■), and Gramoxone Max + Sencor (▲).

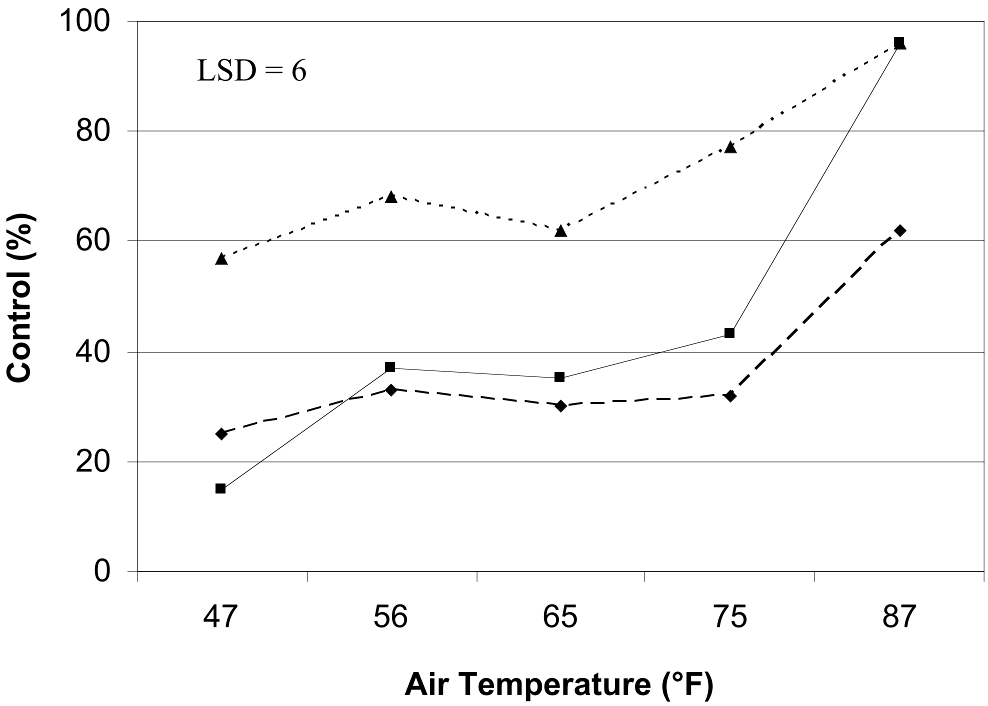

Figure 4. Air temperature effects on henbit control 14 (DAT). Roundup Ultra Max (◆), Gramoxone Max (■), and Gramoxone Max + Sencor (▲).

It takes about 120 air temperature growing degree-days after planting for corn to emerge. This number is fairly variable, from perhaps 80 to 170 GDDs, depending on how well soil temperature tracks air temperature. Corn that we planted at Urbana on March 24 emerged on April 15, during which period GDDs totaled about 160, depending on how many you counted of the 21 GDDs on April 15 itself. There were zero GDDs recorded on about half of the days from planting to emergence, interrupted by two warm periods, when GDDs accumulated. Clearly, the seed was experiencing ups and downs in temperature, and probably starts and stops to the germination process as well.

Stands from the March 24 planting are good where we used uncoated seed and not very good where we used Intellicoat polymer-coated seed. This was not because of the intended effect on coated seed: For some reason our resident ground squirrels (and possibly birds) much preferred the coated seed to the uncoated, and they ate more than half of the coated seeds before emergence. We think that they identify seed by smell (there is only one small hole opened in the soil to each seed) and that perhaps they can smell the polymer coating. In any case, this is a problem at the research center that would be much less likely to occur in production fields, except where there are rodent problems in some fields.

Corn planting is well under way, with the official report showing that 21% of the state's corn crop had been planted by April 20. Planting conditions continue to be very good in most areas, though cool soil temperatures still are holding back the rush in the northern part of the state. This week will see another jump in progress, though, and we might well reach the 50% by May 1 that has marked seasons with early-corn planting in recent years.

Although good soil conditions at planting usually minimize emergence problems, such problems can still crop up. Herbicides that can interrupt seedling growth and result in plants leafing out underground are not as commonly used at high rates as they once were, and we do not see this problem as often as we once did. Cloddy soils will also let light penetrate into the soil, and once light hits the tip of the growing seedling, as it does normally just after emergence, the tip of the coleoptile stops growing and the leaf inside it breaks out. If this happens before emergence, such leaves usually fail to emerge. Soil crusting can also lead to eventual leafing out underground. Some seed treatments have been implicated as doing this, but there isn't much evidence to support that. People who test seed in the lab also report that some lots produce "abnormal" seedlings, sometimes with twisting or splitting of the coleoptile. That seems rare in the field, at least when emergence conditions are good and emergence is rapid.

Regardless of the cause, plants that leaf out underground, or otherwise have the emergence process seriously retarded, often do not survive. If they do survive, they may be so far behind their healthy neighbors that they fail to compete for water and light, and hence produce little or no yield. Ideally, corn plants in a field will all emerge within about 48 to 72 hours. If something delays emergence of some plants, especially in comparison to the plants next to them, they will start behind and may never catch up. In other words, if there are emergence delays, it's much better if the whole field or large parts of the field are delayed uniformly, compared to uneven size of adjoining plants.—*Emerson Nafziger*

PLANT DISEASES

Scouting for Soybean Cyst Nematode

Think you don't have soybean cyst nematode (SCN)? Think again! Over 80% of the soybean fields in Illinois are infested with SCN. We have found SCN in 102 of 102 counties.

In high-yield environments, SCN can reduce yields up to 30% *without causing any symptoms you can see*. When you do see symptoms (such as yellowing and stunting), they're associated with either very high SCN numbers or some other problem in the field, adding to the stress caused by SCN. Common problems that show up in SCN-infested fields include Phytophthora rot, rhizoctonia root rot, and nutrient deficiencies. These can mask the underlying SCN problem. SCN infestation can also increase the likelihood that other diseases, such as sudden death syndrome (SDS) and brown stem rot (BSR), will show up later in the season.

SCN damage can be controlled by rotations with nonhost crops (such as corn) and the use of SCN-resistant varieties. To use rotation effectively, you need to know two things:

- Is SCN present in the field?
- What is the level of infestation?

To find out if SCN is present, you can do one of two things:

- Take a soil sample (directions following) and submit it to a lab for a cyst count.
- Wait until 40 to 50 days after planting soybeans. GENTLY dig up plants scattered throughout the field and GENTLY shake them to remove excess soil. Inspect the roots for small, white-to-yellow, glistening bodies on the surface of the roots (a hand lens makes this task much easier). These bodies will be much smaller than the nitrogen-fixing nodules.

To find out the level of infestation, you should submit a soil sample for an egg count. (Cyst counts will also tell you the level of infestation but are not very accurate if resistant varieties have been grown in the field.) It is extremely important to take a "good" sample (description following) because SCN populations are not distributed evenly in a field: If you sample in the wrong place, your count may be too high or low.

A soil sample should be a composite of 20 or more cores taken in a zigzag pattern across a field. Most nematologists agree that one sample can adequately represent a 5-acre area; some say as high as 20 acres. So what do you do if the field is 300 acres? Collect samples from two or more arbitrarily selected 5-acre sections that represent similar soil types and crop histories. There's no need to sample the entire field unless you're planning to plant different varieties in different sections of the field.

You'll need the following items: a soil-coring tube (you can use any soil-sampling device such as a trowel or shovel if a soil-coring tube is not available); a bucket; quart-sized Ziploc bags, one for each sample; a permanent marker; and a cooler. Collect about 20 soil cores (or scoops) to a depth of 8 to 10 inches from the sample area (see the previous paragraph for a description). Put each core into the bucket; and after all cores have been collected, mix thoroughly. Remove enough of the mixed sample to fill a plastic bag. Seal the bag and mark it with the permanent marker so that you'll know where the sample came from when the results come back. Place the sample in the cooler and keep it cool until you can pack it and ship it to a lab for analysis. Allowing the samples to heat up will effectively cook the nematodes in the soil and make it impossible for you to get a good analysis. If you're going to keep the samples for more than a day, put them in a refrigerator.

Illinois has a number of soil-testing labs that can do SCN analyses, both egg counts and cyst counts. In addition, the University of Illinois Plant Clinic can provide nematode analyses for any crop or home landscape plant (http://plantclinic.cropsci.uiuc.edu/).

For further information, call Terry Niblack at (217)244-5940 or email tniblack@uiuc.edu.—*Terry Niblack*

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

Field activity focused on spring tillage, anhydrous ammonia application, herbicide application, and corn planting. Rainfall on April 19 ranged from 0.2 to 1.6 inches, with higher precipitation from Moline to Freeport.

Corn planting prior to April 19 was not widespread throughout the region because of some concerns over cold soil temperatures and/or dry soil conditions. However, planting activity increased this week after fields dried from the weekend rainfall.

Southern Illinois

Some localized fieldwork is again starting up after last weekend's rainfall. Precipitation across the south varied from 1 to 3 inches. In some areas, 30% or more of the corn is in the ground but still waiting for warmer temperatures to help it emerge. Despite passage of the recent storm front, Ron Hines at Dixon Springs did not report any intense captures of black cutworm moths during the past week.

Both wheat and alfalfa are growing rapidly, with the cool conditions favoring the wheat crop. So far, we have received no reports of major disease problems with either crop. Alfalfa producers should remain vigilant for alfalfa weevil infestations. If weevils reach threshold levels, it will soon become a management decision to either spray or take an early harvest and then monitor the regrowth for further feeding damage.

West-Central Illinois

A slow-moving cold front brought cool weather and rain to most of the region late last week, which resulted in little fieldwork being completed. Cumulative rainfall varied from a few tenths to nearly 2 inches, with less received in the north than in the south. In some areas, producers were able to resume fieldwork on Tuesday, and some reports that planting had resumed in the northeast part of the region have been received.

Corn that was planted the first and second weeks of April is just beginning to emerge, but it is too early to speculate as to the condition of stand. Intense captures of black cutworm moths were reported in Adams, McDonough, and Sangamon counties within the past week, and educators will be tracking GDUs to predict the onset of feeding.

Wheat looks good in most areas and has put on substantial growth within the past week. On some sandier soils, the crop is well into the jointing stage.

U of I Extension Newsletter Service
University of Illinois
at Urbana-Champaign
528 Bevier Hall, MC-184
905 S. Goodwin Avenue
Urbana, IL 61801

Contributing Authors

Kelly Cook (kcook8@uiuc.edu), Extension Entomology, (217)333-6651

Mike Gray (m-gray4@uiuc.edu), Extension Entomology, (217)333-6652

Aaron Hager (hager@uiuc.edu), Extension Weed Science, (217)333-4424

Terry Niblack (tniblack@uiuc.edu), Crop Sciences, (217)244-5940

Emerson Nafziger (ednaf@uiuc.edu), Crop Sciences, (217)333-4424

Christy Sprague (csprague@staff.uiuc.edu), Extension Weed Science, (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.
Editor: Erin Cler; formatter: Oneda VanDyke.

UNIVERSITY OF ILLINOIS EXTENSION

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