Pest&Crop

May 26, 2000 - No. 10

In This Issue

Insects, Mites, and Nematodes

Corn Rootworm Hatch is Underway- (*John Obermeyer, Larry Bledsoe, and Rich Edwards*) -

- As expected, rootworm hatch is earlier this year compared to last year
- Assess insecticide performance or need for post-insecticide by sampling at peak hatch
- Earlier egg hatch should mean earlier adult emergence

The mild winter and spring have resulted in the appearance of corn rootworm larvae in corn roots about a week earlier than what was observed last year. Corn roots collected on May 22 near Lafayette in Tippecanoe County revealed rootworm larvae. Because of limitations on sample size, it is likely that hatching began at least 3-5 days earlier. Hatch in southern Indiana counties has occurred several days earlier while hatch in northern counties is just beginning. Eggs will continue to hatch for several more weeks with the peak hatch at early to mid June in northern Indiana (see rootworm first observance chart later in newsletter). Anyone planting or replanting corn in high risk state regions during the next two weeks (in high risk regions) should consider using a soil insecticide to protect the roots of emerging plants.

Sampling a corn field at the time of peak hatch, before lay-by, give an indication of the performance of a soil insecticide, if one was applied at planting, or those waiting to determine the need for a soil insecticide at cultivation. Randomly select 1 plant in each of 10 representative areas of a field. Using a shovel, cut a 7-inch cube of soil around the base of each plant, making certain that the blade enters the soil vertically. Lift the plant and soil out of the ground, and place them on a piece of dark cloth or plastic. Slowly break the soil away from the roots and carefully examine the soil and roots for rootworm larvae. Look for small (1/8 to 1/2 inch in length), slender, white larvae with brown head and tail sections.

Count and record the number of larvae found. Repeat the sampling procedure for each plant. After all samples have been processed, determine the average number of rootworms per plant. Two or more rootworm larvae per plant prior to lay-by may signal the need for rootworm larval control.

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Are Slugs Sliming Your Crop? - (*John Obermeyer, Rich Edwards, and Larry Bledsoe*) -

- Slugs are favored by a wet spring with heavy crop residue on the soil surface
- Crop damage and stand losses are most severe when slugs enter open seed slots
- Control options are limited

We received several calls concerning slugs damaging corn and soybeans. Many fields were so severely damaged that replanting was necessary. Ohio State University personnel have reported a very active slug season, especially in northwestern counties. This does come as somewhat a surprise considering how dry it was last summer and fall. Obviously the spring rainfall in that region and the cool temperatures in early May enhanced slug activity.

Slugs are soft-bodied, legless, slimy, and grayish or mottled gastropods (not insects). Their length, depending on species, can reach up to 4 inches, but is usually 1/2 to 1-1/2 inches. Slug populations are greatest in no-till systems and weedy fields because the optimum conditions for slug survival (wet soils and cool temperatures) are most likely to occur under these conditions.

This nocturnal pest can significantly damage both corn and soybeans. On corn, slugs feed on leaf surface tissue resulting in narrow, irregular, linear tracks or scars of various lengths. Severe feeding can result in split or tattered leaves that resembles hail damage. Soybean damage is not as common on the foliage, as it is on the hypocotyl and cotyledons. Given good growing conditions, plants usually outgrow slug damage once the crop is up. Most damage and stand losses by slugs occur when fields are planted too wet and seed slots are not properly closed. In this situation, slugs can be found feeding on the seedlings within the slot, day or night. Once the growing point of corn or soybeans is injured, plant recovery is unlikely.

Slug control is usually difficult, if not impossible. Disruption of their environment, i.e., tillage, is typically not an option, especially on highly erodible land. A metaldehyde pelleted bait, Deadline MPs is labeled and available for use. The cost for product is about $10-15 per acre. Spreading the pellets evenly over the field or damaged areas is another matter; a commercial mechanical dispenser is one possibility. Field trials at Ohio State University have shown good results when the pellets are evenly distributed. With the significant cost and difficulty of application, consider these baits only as a last resort to protect crop stands in highly populated slug areas.

Where replanting is necessary from slug damage, one should strongly consider tilling (disc and/or field cultivator) the area first. This should help dry the area and break-up and bury crop residue. Doing so will discourage further slug activity. Granular and liquid insecticides are ineffective against slugs, as they slime over them. Home remedies, such as spraying plants at night with liquid fertilizer (high salt concentration), has proved ineffective.

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Stalk Borer Migrating - (*John Obermeyer, Rich Edwards, and Larry Bledsoe*) -

- Prevent stalk borer migration
- Migration is or soon to be occurring in Indiana

According to heat unit accumulations (base 41°F), stalk borer have or soon will outgrow their initial host (e.g., grass, ragweed, or corn) and migrate to a new host.....corn! Refer to "Weather Update" in this issue.

Research conducted at Iowa State University shows that leaf feeding by early instars have an insignificant effect on yield. However, once the stalk borer has tunneled ("dead heart"), grain yield reductions are 59% for primary plants (first plant infested) and 74% for secondary plants (second plant infested). The damage obviously intensifies as the larvae increase in size. Refer to *Pest&Crop* #7 for scouting information.

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Corn Plants Being Pulled Down Holes! – (*John Obermeyer*) – We have received notice from several pest managers that they have observed the tips of corn leaves being pulled down holes in the soil. Most are aware that large black cutworm will clip corn and pull them into the soil to feed on during the day. The "damage" described is nothing like this. Read more about this in the article in Agronomy Tips by Eileen Kladivko, "Earthworms Pulling Corn Leaf Tips Into Soil?"

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Claybacked Cutworms in Soybeans – *(Ron Blackwell)* – After hearing reports of cutworms damaging soybeans in northern Indiana, I took the advice of the manager at Frick Services in Wyatt and visited a soybean field in St. Joseph County near Mishawaka. This field had an incredible infestation of cutworms, creating significant stand loss. The feeding damage ranged from severe damage to the cotyledons, to even clipping the soybean plants before they could emerge from the soil surface. After making two incorrect suggestions regarding the species of the cutworms, they were finally looked at under magnification in the lab and determined to be claybacked cutworms. Some of the more heavily infested areas of the field did have remnants of dying chickweed. In these areas, all one had to do to find the cutworms was push the chickweed remains aside with your boot and two or three cutworms could be found underneath. The field was going to be replanted.

Black Light Trap Catch Report
(Ron Blackwell)

County/Cooperator	5/9/00 - 5/15/00							5/16/00 - 5/22/00						
	VC	BCW	ECB	GC	CEW	FAW	AW	VC	BCW	ECB	GC	CEW	FAW	AW
Clinton/Blackwell	0	0	6	0	0	0	0	0	1	8	0	0	0	0
Dubois/SIPAC	0	0	2	0	0	0	0	1	0	3	2	1	0	1
Jennings/SEPAC	0	0	0	0	0	0	0	0	0	4	1	0	0	2
LaPorte/Pinney Ag Center	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Lawrence/Feldun Ag Center	0	2	1	0	0	0	4	0	0	4	0	0	0	1
Randolph/Davis Ag Center	0	1	0	0	0	0	7	0	1	0	1	0	0	0
Whitley/NEPAC	0	3	19	0	0	0	93	1	0	28	2	0	0	18

BCW = Black Cutworm ECB = European Corn Borer GC = Green Cloverworm CEW = Corn Earworm
AW = Armyworm FAW = Fall Armyworm VC = Variegated Cutworm

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DATES CORN ROOTWORM LARVAE FIRST OBSERVED IN CORN ROOTS, TIPPECANOE COUNTY, INDIANA, 1982-2000.

Plant Diseases

Wheat Disease Update – (*Gregory Shaner*) -

- Disease still appears to be light in Indiana wheat fields

There still appears to be little disease in Indiana's wheat crop. Leaf disease is light. The frequent rains during the past couple of weeks were probably favorable for Stagonospora and Septoria leaf blotches, but the comparatively low temperatures may have held down the frequency of infection. I have seen a few lesions on the second leaf below the flag (leaf F-1), but they were quite small and not producing fruiting bodies of the fungus. I had one report of a field with severe powdery mildew, but generally this disease appears to be light. Pat Lipps from Ohio State University reports that powdery mildew is severe in some wheat fields in Ohio, so growers in northeastern Indiana should check their fields for this disease. I have had no reports of nor seen any rust.

Symptoms of barley yellow dwarf virus infection are clearly evident, but the percentage of infected plants appears to be very low. Infected plants stand out clearly because their flag leaves are yellow toward the tip. In some cases there is also reddening. Symptoms may be on isolated single plants or on small groups of plants. This pattern reflects the feeding behavior of the aphid vectors of the virus. If the percentage of infected plants is low, there will be little loss from the disease.

Although we have had frequent rains while wheat has been heading, I have so far seen only a few heads with scab. Many of our rainfall events have been of the brief, heavy variety rather than a light, steady drizzle. Prolonged periods of moisture seem to be critical for severe scab to develop. Also, night temperatures during the rainy periods were often low and this may have diminished spore production by the scab fungus, *Gibberella zeae*. In our experiments to monitor the fungus at the Purdue Agronomy Research Center (Tippecanoe County), we detected airborne spores during the early stages of wheat flowering, but in rather low numbers. We do not have data yet on spore numbers during the past week because it takes several days for colonies to develop on the selective growth medium we use to detect the fungus.

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Corn Seedling Diseases – (*Gregory Shaner*) -

- Seedling blights may contribute to uneven stands and growth of young corn

Recent rains that have kept the upper soil layer wet, especially in no-till situations, might lead to problems with seedling blights on corn. Genetics, seed condition, tillage, date of planting, depth of planting, and chemical applications all influence the incidence and severity of seedling blight. Anything that delays growth of the young plant will tend to increase the likelihood of seedling blight. If seedling blight is a problem, the primary cause may be one of the factors mentioned above. The fungi that infect the seedling are taking advantage of a plant that is weakened.

Several corn samples have been received in the Plant and Pest Diagnostic Laboratory from fields that had a low frequency of stunted or dying plants. In some cases there was no indication of an infectious disease being responsible for the retarded plant development. In a couple of samples, the main problem appeared to be heavy feeding by the corn flea beetle on young (2 leaf collars) corn. Bacteria could be seen streaming from the cut ends of leaves, indicating Stewart's wilt. The bacterium responsible for this disease, *Erwinia stewartii*, is transmitted to corn from the flea beetle during feeding. Stewart's wilt is usually not a problem in hybrid field corn, but can be serious in seed corn and in sweet corn. If the bacteria move into the growing point, the plant can be killed. Some field corn hybrids appear to have less resistance than is typical, and may be damaged.

Regardless of the specific cause of seedling death, a decision about replanting must be based on the amount of stand reduction, the pattern of plant death, and the time at which replanting can be done. AY-264, Estimating Yield and Dollar Returns from Corn Replanting, provides detailed information on determining whether replanting should be considered.

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Early Season Soybean Diseases – (*Gregory Shaner*)

- Several fungi can infect young soybeans

Like corn, young soybean plants are subject to seedling blights. When soils are saturated after planting, *Phytophthora sojae* and various species of *Pythium* can cause seed rot and seedling blight. Roots and hypocotyls of seedlings turn dark and develop a soft rot. The young plant wilts and dies. *Phytophthora sojae* is the same fungus that causes Phytophthora rot, a disease that can appear later in the growing season. Many varieties of soybean have resistance to *Phytophthora*. Resistance conferred by *Rps* genes is effective in the seedling stage. However, these genes are race-specific, meaning that a particular gene will be effective against some races of *Phytophthora sojae* but not against others. If a race of the fungus occurs in a field that overcomes a particular gene, for example *Rps*-1*k*, then a variety that has only this gene for resistance will not be protected. Surveys by Dr. Scott Abney have shown considerable diversity in races of *Phytophthora* in Indiana soybean fields, so growers should keep records on the genes for resistance in varieties they grow. If a problem with stand establishment occurs, this may indicate that a race of the fungus has built up in a field that overcomes the resistance gene in that variety. Even if a different variety is subsequently planted in the field, if it has the same *Rps* gene, it will be susceptible.

Seedling blight caused by species of *Pythium* tends to occur at lower temperatures (below 60°F) than favor *Phytophthora*. There is no resistance in soybean to *Pythium*, so if beans are planted into heavy, poorly drained, cool soils a seed treatment fungicide that contains metalaxyl or mefenoxam may be advisable.

Rhizoctonia solani is another common soilborne fungus that can cause damping-off of soybean seedlings. Whereas *Phytophthora* and *Pythium* tend to be problems in wet, poorly drained soils, *Rhizoctonia* is a problem on lighter soils. The typical symptom of post-emergence seedling blight caused by *Rhizoctonia* is a sunken, reddish lesion on the hypocotyl. The lesion may eventually girdle the stem and kill the plant. This may not occur until later in the season. Anything that places stress on young soybean plants (insect feeding, poor soil, nematode feeding, and herbicide injury) will increase the likelihood of infection by *Rhizoctonia*.

Many of the same factors that must be considered in deciding whether or not to replant corn also apply to soybeans. Research at Purdue and elsewhere indicates that considerable reduction in plant population can occur without much effect on yield, depending on the size of gaps in the row and weed density.

Agronomy Tips

Assessing Hail Damage in Corn - (*Bob Nielsen*) –

- Yield loss from hail caused by both stand reduction and leaf area reduction
- Give a damaged field time to show its recovery ability

The 2000 growing season has already yielded numerous hail storms throughout Indiana with more apt to come in the future. Looking out the kitchen window the morning after such a storm can be one of the most disheartening feelings in the world to a farmer.

Yield loss in corn due to hail damage results primarily from 1) stand reduction caused by plant death and 2) leaf area reduction caused by hail damage to the leaves. Assessing hail damage in corn therefore requires the grower or consultant to estimate the severity of each of these factors.

Assessing Plant Death

As with most early-season problems, evaluation of hail-damaged fields should not be attempted the day after the storm hit because it is too difficult to predict survivability of damaged plants by simply looking at the damage itself. Corn has an amazing capacity to recover from early season damage and you need the patience to allow the damaged plants to demonstrate to you whether they will recover or not. Viable plants will usually show visible new growth within 3 to 5 days with favorable weather and moisture conditions.

One thing that can be done shortly after the storm, however, is to determine the relative condition of the growing point area of the stalk. The main growing point (apical meristem) of a young corn plant is an area of active cell division located near the tip of the pyramid-shaped stalk tissue inside the stem of the plant. All the leaves and the tassel are formed at the growing point.

You can determine the position of the growing point by splitting the stalk down the middle and looking for the pyramid-shaped area of the upper stalk. If hail has damaged the growing point or cut off the stalks below the growing point, then those plants should not be counted as survivors.

Remember that yield loss is not directly proportional to the reduction in the number of plants per acre when the damage occurs early in the growing season (see Table 2, accompanying article on replant decisions). The remaining plants can compensate for the absent plants by increasing their potential ear size. A 25 percent reduction in plant population should reduce yield by less than 10 percent. A 50 percent reduction in plant population should reduce yield by less than 25 percent.

Assessing Defoliation

Leaf damage by hail always looks worse than it really is. Shredded leaves that remain connected to the plant and remain green will actually continue manufacturing photosynthates for the 'factory.' It takes a practiced eye to accurately estimate percent leaf death by hail. With that caution in mind, percent damage to those leaves exposed at the time of the hail storm can be estimated and used to estimate yield loss due to the defoliation itself.

The effects of leaf death on yield increases as the plants near silking, then decreases throughout grain fill. Therefore, the grower needs to determine the growth stage of the crop when the hail damage occurred (see my earlier article: Leaf Staging Methods for Corn).

If you are walking damaged fields many days after the storm, you can stage the crop that day and backtrack to the day of the storm by assuming that leaf emergence in corn occurs at the rate of about 1 leaf every 85 GDDs from emergence to V10 (ten fully visible leaf collars) or every 50 GDDs from V10 to the final leaf (see my earlier article: Predicting Corn Phenology for Phun and Profit). Given recent temperatures and the fact that none of Indiana's corn crop is yet beyond leaf stage V10, this rate of leaf emergence translates to about 1 leaf every 6 days.

Once percent leaf damage and crop growth stage have been determined, yield loss can be estimated by using the defoliation chart provided below in Table 1. This table is a condensed version of the season-long table published in the Purdue Extension publication ID-179, Corn and Soybean Field Guide (pp. 13-14) or in NCH-1, Assessing Hail Damage in Corn.

Example

Let's say that after walking your field of corn that is at leaf stage V4 and assessing the damage, you have determined that of your original 30,000 plants per acre, only 20,000 will survive the hail damage. If your original planting date was 20 April, you began the season with a yield potential of only 99% of optimum to begin with (Table 2, accompanying article on replant decisions). Your surviving stand of 20,000 now has an upper yield potential of 91% of optimum. Because you did not begin with 100% of optimum yield potential in the first place, the yield loss due to stand reduction by hail is only 8% of optimum (99 minus 91). Fortunately for you, the corn was young enough that any defoliation of the surviving stand will not result in any additional yield loss (Table 1, below).

Don't forget, this and other timely information about corn can be viewed at the Chat 'n Chew Café on the World Wide Web at <http://www.kingcorn.org/

chatchew.htm>. For other information about corn, take a look at the Corn Growers' Guidebook on the World Wide Web at <http://www.kingcorn.org/>.

Table 1. Estimates of percent yield loss in corn due to leaf defoliation.

Growth Stage	Percent Leaf Defoliation			
	25	50	75	100
7-leaf	0	2	5	9
8-leaf	0	3	6	11
9-leaf	1	4	7	13
10-leaf	1	6	9	16
11-leaf	1	7	12	22
12-leaf	2	9	16	28
13-leaf	2	10	19	34
14-leaf	3	13	25	44

Note 1: Growth stage equals the 'droopy leaf' method.
Note 2: Adapted from the National Crop Insurance Association's "Corn Loss Instruction" (Rev. 1984).

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Earthworms Pulling Corn Leaf Tips Into Soil? – (*Eileen Kladivko, Agronomy Dept.)* -

There have been several questions recently about whether earthworms, and nightcrawlers in particular, will pull the tips of green corn leaves down into their burrows. A few reminders about nightcrawlers and their activity are needed first. Nightcrawlers typically construct "middens", or piles of castings (excrement) and residues over the opening of their burrows. These middens are often quite visible as small mounds in no-till fields, especially in soybean residue where the residue cover is often less than in corn stalks. In fields that are routinely "clean-tilled", with no surface residue remaining, nightcrawlers generally do not survive in great numbers, because they prefer to have residue (their food source) available at the soil surface. If low populations of nightcrawlers are present in clean-tilled fields, they may not construct full middens, due to the lack of surface residue, but they will still normally deposit some of their castings at the soil surface, leaving a small but visible pile. Heavy rainstorms may destroy the pile for a time, however, leaving little definitive evidence of whether a particular hole belongs to a nightcrawler or not.

In fields where true middens exist, I have seen the tips of green corn leaves pulled into the midden, usually when surface residue has become limiting (ie by mid-to late- season sometimes the surface residue has been reduced enough that the nightcrawlers are looking for more food). The corn leaves had first been touching or laying on the ground, due to heavy rains or other weather factors that made the leaf accessible to the worm. During this recent early-season period when we've had heavy rains, corn leaves may have been flattened to the ground enough to be available for nightcrawlers to pull into their middens. However, where corn leaf tips have been pulled into bare, open holes, with no evidence of middens or castings at the surface, it is not clear whether these are nightcrawlers or some other soil organism. Nightcrawler channels can be confirmed with some careful digging and excavation, looking for evidence of casting material along the wall of the burrow, or following the hole to see whether it goes at least 12 inches deep, for example. Nightcrawler channels usually go at least 2 to 3 ft. deep, so if the hole you observe stops at 4 inches deep, it's unlikely to be a nightcrawler.

If it is nightcrawlers, is this a problem? Not likely, but it's never really been studied before! The nightcrawler usually pulls dead residue to its midden, and will pull the corn leaf tips only when they are flattened to the ground. The leaf pulled into a midden or burrow will likely eventually break, letting the plant grow upright again, perhaps minus one leaf or part of one leaf.

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Factors to Consider in Corn Replant Decisions – (*Peter Thomison, Ohio State University*)-

(*Originally published OSU's C.O.R.N. Newsletter, 22 May 2000*)

Replant decisions should be based on strong evidence that the returns to replanting will not only cover replant costs but also net enough to make it worth the effort. Presented here are some guidelines to consider when making a replant decision. Much of this information is available in Agronomy Fact Sheet (AGF12495) "Guidelines For Corn Replant Decisions" also accessible at <http://ohioline/ag.ohio-state.edu/agf-fact/0124.html>.

Don't make a final assessment on the extent of damage and stand loss too quickly. A corn plant's growing point remains protected below the soil surface until six to seven leaves have emerged. Thus, early damage to aboveground foliage does not necessarily kill the plant. Generally, 2 to 4 days of 70°F or warmer temperatures are sufficient to stimulate new leaf growth on an affected plant. If these new leaves seem to be unfolding naturally, the plant should survive and resume normal development.

If the crop damage assessment indicates that a replant decision is called for, some specific information will be needed, including:

Original target plant population/Intended plant stand

- Plant stand after damage
- Uniformity of plant stand after damage
- Original planting date
- Possible replanting date
- Likely replanting pest control and seed costs

To estimate after damage plant population per acre, count the number of viable plants in a length of row that equals 1/1000 of an acre and multiply by 1000. (Table 1 shows row length needed for various row widths.) Make several counts in different rows in different parts of the field. Six to eight counts per 20 acres should be sufficient.

When making stand counts, also note plant distribution within the row. Yield loss due to stand reduction results not only from the outright loss of plants but also from an uneven distribution of the remaining ones. Studies have indicated that gaps 14 to 37 inches long reduced yields by about 2% when compared to a uniform stand, whereas 4 to 6 foot gaps reduced yields by about 5%. Therefore, the more numerous and longer the gaps between plants within the row, the greater the yield reduction.

A major consideration in making a replant decision is the potential yield at the new planting date and possibly different planting rate; this can vary depending on the hybrid used, soil fertility and moisture availability. Table 2 shows the effects of planting date and plant population on final grain yield for the central Corn Belt. Grain yields for varying dates and populations in both tables are expressed as a percentage of the yield obtained at the optimum planting date and population. Remember that table values are based on a uniform distribution of plants within the row! Add a 5% yield loss penalty if the field assessment reveals several gaps of 46 feet within rows and a 2% penalty for gaps of 13 feet.

When making the replant decision, seed and pest control costs must not be overlooked. Depending on the seed company and the cause of stand loss, expense for seed can range from none to full cost. You also need to review herbicide and insecticide programs under late planting conditions. For instance, it may be necessary to re-apply herbicides, especially if deep tillage is used. However, try to avoid such tillage depending instead on postemergence chemicals or cultivation for weed control.

Concerning insect control, if insecticides were applied in the row at initial planting, consider reapplication if tillage is used before replanting. Also remember that later planting dates generally increase the possibility of damage from insects such as European corn borer, corn rootworm beetle and black cutworm. Therefore, understand that replanting itself does not guarantee the expected harvest population. Corn replant decisions early in the growing season will be based mainly on plant stand and plant distribution. Later in the season as yields begin to decline rapidly because of delayed planting, calendar date assumes increased importance.

The cost of replanting will differ depending on the need for tillage and chemical application. The cost and availability of acceptable seed will also be considerations. These factors must be weighed against expected replanting yield gains. If after considering all the factors there is still doubt as to whether or not a field should be replanted, you will perhaps be correct more often if the field is left as is.

Sources: Guidelines for making corn replant decisions. 1990. National Corn Handbook. NCH30; Illinois Agronomy Handbook. 1994. University of Illinois.

Table 1. Row length required to equal 1/1000 acre when corn is planted at various row widths.

Row Width (inches)	1/1000 acre (feet)
20	26.1
28	18.7
30	17.4
36	14.5
38	13.8
40	13.1

Table 2. University of Illinois replant chart developed under high yielding conditions - expressed as a percent of optimum planting date and population yield, uniformly spaced with row (adapted from Nafziger, 1994).

Planting Date	Plants per acre at Harvest					
	10,000	15,000	20,000	25,000	30,000	35,000
April 10	62%	76%	86%	92%	94%	93%
April 20	67%	81%	91%	97%	99%	97%
April 30	68%	82%	92%	98%	100%	98%
May 9	65%	79%	89%	95%	97%	96%
May 19	59%	73%	84%	89%	91%	89%
May 29	49%	63%	73%	79%	81%	79%

*Source: University of Illinois

RLNielsen's Note: Similar information is available from Purdue Cooperative Extension publication AY-264, Yield and Dollar Returns from Corn Replanting. This publication provides you with a worksheet-format to help you calculate the economics of a replant decision. It is available from your local Purdue Cooperative Extension office or on the Web at <http://www.agcom.purdue.edu/AgCom/Pubs/AY/AY-264.html>.

Pest Management Tips

Integrated Pest Management
Purdue University

Prepare Grain Bins for Wheat, Now - (*Linda Mason and John Obermeyer*) -

- Stored grain insect infestations usually begin from poor sanitation
- Procedures are given to prevent infestations
- Now is the time to carry through these procedures

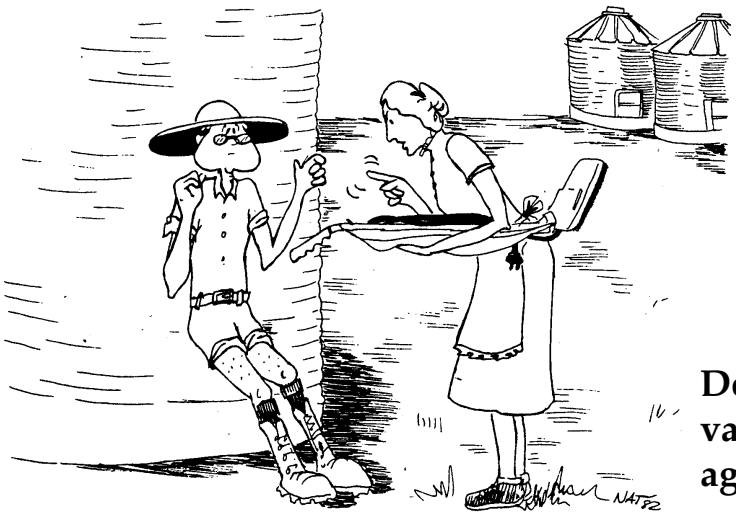
The 2000 wheat harvest will soon be here. Preparing bins for storage now goes a long way toward preventing insect infestations during the summer. Several species of insects may infest grain in storage. The principal insects that cause damage are the adult and larval stages of beetles, and the larval stage of moths. Damage by these insects includes reducing grain weight and nutritional value; causing contamination (alive or dead); odor, mold, and heat problems that reduce the quality of the grain.

Newly harvested wheat may become infested with insects when it comes in contact with previously infested grain in combines, truck beds, wagons, other grain-handling equipment, augers, bucket lifts, grain dumps, or grain already in the bin. Insects may also crawl or fly into grain bins from nearby accumulations of old contaminated grain, livestock feeds, bags, litter, any other cereal products, or rodent burrows.

Insect infestations can be prevented with good management practices. Now that many grain bins are empty, the following guidelines should be used before the 2000 grain is placed in bins:

- Brush, sweep out and/or vacuum the combine, truck beds, transport wagons, grain dumps, augers, and elevator buckets to remove insect-infested grain and debris.
- In empty bins, thoroughly sweep or brush down walls, ceilings, ledges, rafters, braces, and handling equipment and remove debris from bins.
- Inside cleaned bins, spray wall surfaces, ledges, braces, rafters, and floors with an approved insecticide (Chlorpyrifos-methyl, methoxychlor, cyfluthrin or diatomaceous earth) creating a perimeter barrier. Outside, complete this barrier by treating the bases and walls up to 15 feet high, plus the soil around the bins.
- Remove all debris from fans, exhausts, and aeration ducts (also from beneath slotted floors, when possible). Fumigate false floor area if bin has a history of insect infestation or you have not cleaned false floor area recently.
- Remove all debris from the storage site and dispose of it properly according to area, state, and/or federal guidelines (this debris usually contains insect eggs, larvae, pupae, and/or adults, ready to infest the newly harvested grain).
- Remove all vegetation growing within ten feet of the bins (preferably the whole storage area). Then spray the cleaned area around bins with a residual herbicide to remove all undesirable weedy plants.
- Repair and seal all damaged areas to the grain storage structure. This is not only to prevent insect migration into the bin, but also to prevent water leakage, which leads to mold growth.
- Do not store newly harvested grain on old grain already in storage.
- Whenever fans are not operated, they should be covered and sealed. This reduces the opportunity for insects and vertebrates to enter the bin through the aeration system.

Bug Scout



Don't let me catch you with my vacuum cleaner in that grain bin again!

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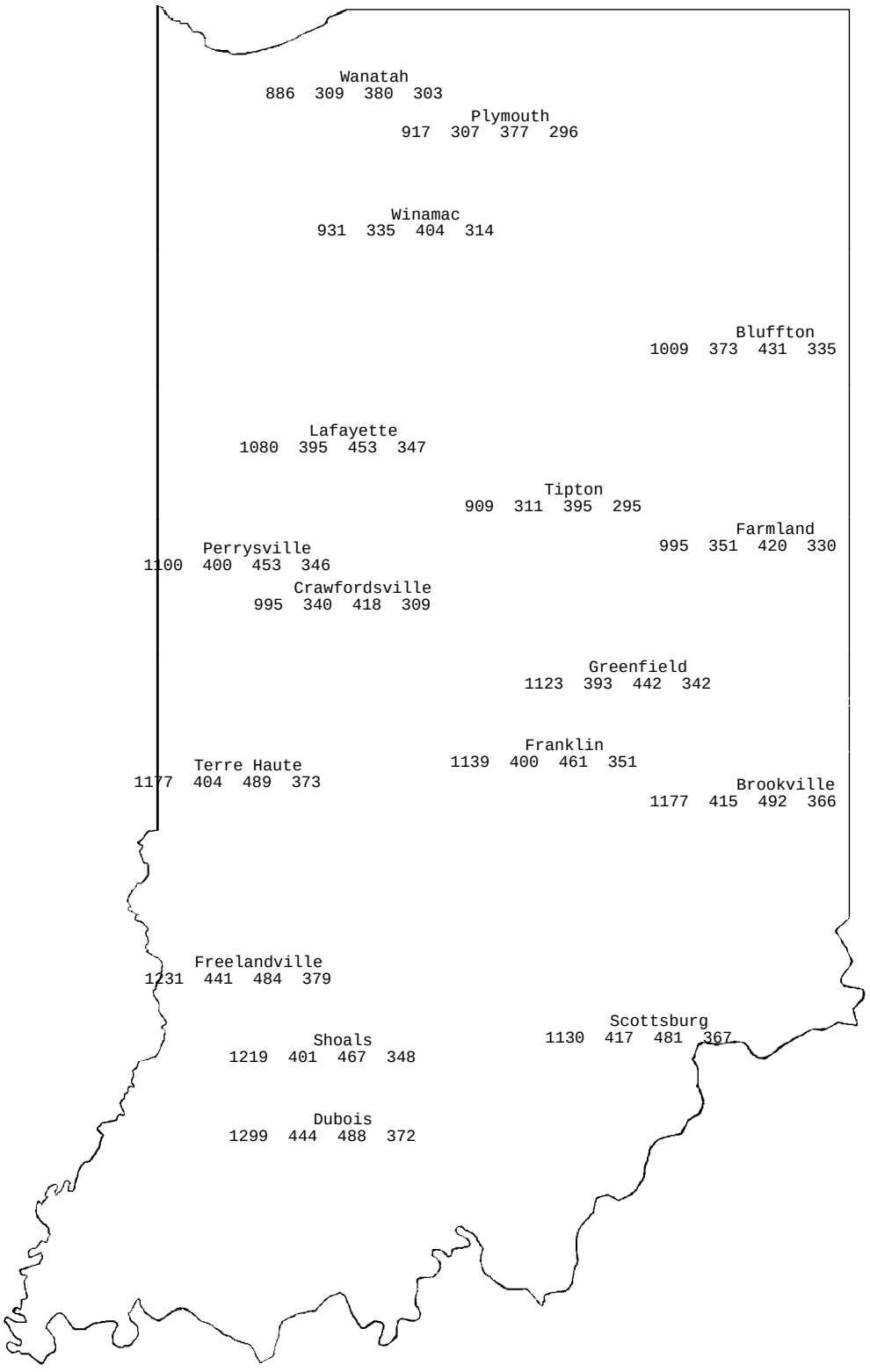
Weather Update

Temperature Accumulations from Jan. 1 to May 24, 2000

MAP KEY
Location
HU41 HU50 GDD(5) GDD(35)

4" Bare Soil Temperatures 5/24/00

HU41 = heat units at a 41°F base from Jan. 1, stalk borer egg hatch at approx. 600, larval movement from grasses to corn at approx. 1,400
HU50 = heat units at a 50°F base from date of intensive moth capture, for black cutworm development (larval cutting begins about 300)
GDD(5) = Growing Degree Days from April 15 (5% of Indiana's corn planted), for corn growth and development
GDD(35) = Growing Degree Days from April 30 (35% of Indiana's corn planted), for corn growth and development



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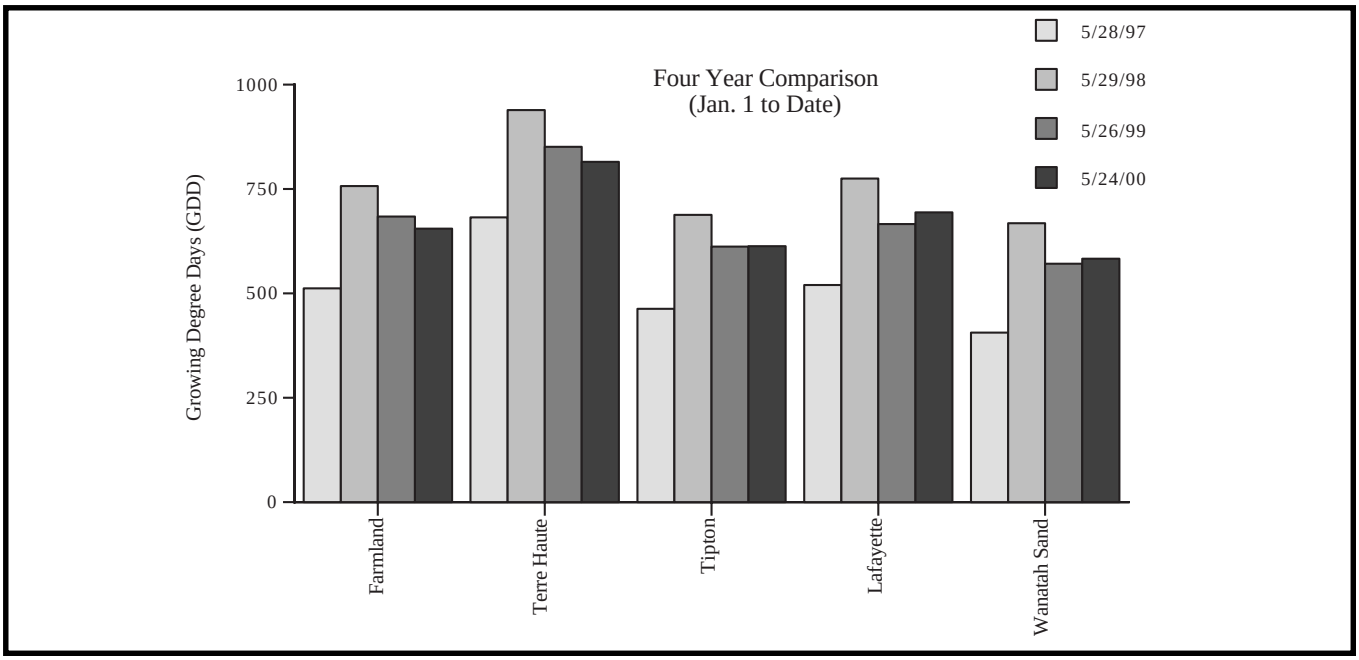

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