Pest & Crop

Purdue Cooperative Extension Service

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In This Issue

Insects, Mites, And Nematodes

Rootworm Hatch Detected in West Central Indiana - (*John Obermeyer, Christian Krupke, and Larry Bledsoe*)

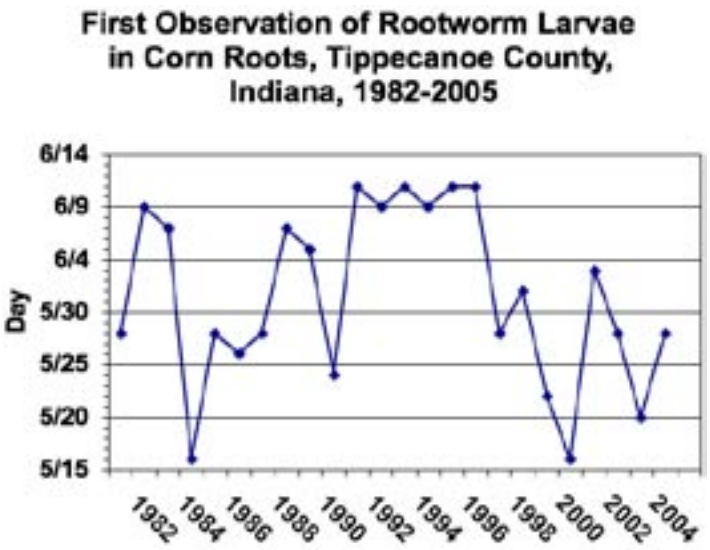
- As expected, rootworm hatch is later this year than last
- Egg hatch occurs over an extended period of time.
- Hatched larvae are favored by moist, but not saturated, soils.

Temperature swings this spring have resulted in delayed hatch of corn rootworm larvae, about a week later than what was observed last year. Corn roots collected on May 31 near Lafayette in Tippecanoe County revealed rootworm larvae. Judging from the size of the larvae observed, it is likely that they hatched a few days earlier. Hatch in southern Indiana counties occurred several days ago while hatch in northern counties is just beginning. Eggs will continue to hatch for several more weeks with the peak hatch about mid-June. Anyone planting or replanting corn during the next two weeks should consider using a soil insecticide to protect the roots of emerging plants.

As discussed in *Pest&Crop* #9, "Early Planted Corn and Rootworm Insecticide Efficacy," it will soon be determined how efficacious rootworm insecticides, applied at planting, will be this spring. Some factors that may determine success or failure of rootworm protection are soil egg load, size of root systems, soil moisture, soil type/structure, and the amount of insecticide degradation. Soil moisture plays a key role in larval survival. Moisture extremes, dry or wet, are detrimental to hatched rootworm larvae attempting to locate corn roots, as they can desiccate or drown, respectively, in these types of soils. High organic matter or sandy soils generally have less rootworm damage, as larval survival is low. Compacted soil hinders the ability of the larvae to move through the soil, and these soils are also not conducive to optimal root growth. In general, soil conditions that favor corn growth and development are also favorable for rootworm growth and development.

Newly hatched rootworm next to root hair

Larval sampling procedures and root damage inspections will be given in future issues of the *Pest&Crop*.



Soybean Aphid Found in Soybean – *(John Obermeyer, Christian Krupke, and Larry Bledsoe)*

- Soybean aphid season has "officially" begun for 2005.
- Mid to late summer populations are the ones to watch.

On May 26, Purdue researchers found a winged soybean aphid in north central Indiana on cotyledon stage soybean plants. This is the earliest find on soybean, compared to early to mid June in past years. However, it is important to keep in mind that first observation of this aphid in soybean has very little bearing on population or damage predictions for 2005. The "take-home message" is that winged aphids have begun to move from their overwintering host (buckthorn) to their alternate host - soybeans.

It is not necessary at this time for pest managers to commence soybean aphid sampling. We certainly will be keeping abreast on what occurs in future weeks with soybean aphid populations in Indiana and states to our north and west. We feel that our greatest threat from this pest lies with mass aerial movement from areas of high infestation. Watch for more on this pest in future issues of the *Pest&Crop*.

Prepare Grain Bins for Wheat Harvest - (*Linda Mason*)

- 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 2005 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 damage 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, or any other cereal products.

Insect infestations can be prevented with good management practices. Now that many grain bins are empty, the following guidelines should be used before the 2005 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, Storcide II® (chlorpyrifos-methyl (the active ingredient in Reldan – stored grain insecticide) and deltamethrin), Tempo® (cyfluthrin), Diacon II® (methoprene) or various diatomaceous earth (D.E.) products) 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).

• 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.

When grain is placed in bin you may treat with an approved insecticide such as Storcide II which has CODEX MRL (maximum residue limits) tolerances, so labeled crops protected with Storcide II may be shipped to international markets and any of the D.E. products.

Black Light Trap Catch Report - *(John Obermeyer)*

County/Cooperator	5/17/05 - 5/23/05							5/24/05 - 5/30/05						
	VC	BCW	ECB	SWCB	CEW	FAW	AW	VC	BCW	ECB	SWCB	CEW	FAW	AW
Dubois/SIPAC Ag Center	1	1	0	0	0	0	3	0	0	5	0	0	0	4
Jennings/SEPAC Ag Center	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Knox/SWPAC Ag Center	0	1	0	0	0	0	2	1	0	0	0	0	0	1
LaPorte/Pinney Ag Center	0	0	0	0	0	0	2							
Lawrence/Feldun Ag Center	0	0	0	0	0	0	2	0	0	3	0	0	0	2
Randolph/Davis Ag Center	0	0	0	0	0	0	1							
Tippecanoe/TPAC Ag Center	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Vermillion/Hutson	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Whitley/NEPAC Ag Center	0	0	0	0	0	0	5							

VC = Variegated Cutworm, BCW = Black Cutworm, ECB = European Corn Borer, SWCB = Southwestern Corn Borer, CEW = Corn Earworm, FAW = Fall Armyworm, AW = Armyworm

Weeds

Harvest Aid Herbicides for Winter Wheat – (*Bill Johnson, Glenn Nice, Tom Bauman*)

The herbicides shown in Table 1 (following page) are labeled for use as harvest-aid treatments in winter wheat. These herbicides cannot be used before the hard dough stage of wheat (30% grain moisture or less). Keep in mind that it is likely that weed growth in wheat at that time likely be over 1 foot tall when wheat is in the hard dough stage. In addition, because weeds will be large, it will take 5 to 15 days for herbicides to desicate the weeds. Therefore we recommend the use of full labeled rates and tankmixes to increase the chance of success on large weeds. Labeled tankmix partners for harvest aid treatments in wheat include 2,4-D + glyphosate, 2,4-D + Clarity, and Clarity + glyphosate. If soybean will be double-cropped after wheat harvest, it would be advisable to avoid use of 2,4-D and Banvel/Clarity because of the required recropping interval.

Table 1. Herbicides labeled for use as winter wheat harvest-aid treatment

Herbicide and Formulation	Formulated Product Rate	Weeds Controlled	Application Method and Precautions
2,4-D amine or ester	Amine 1.5 lb. ai/A Ester 0.5 to 1 lb. ai/A	Suppression of wild garlic, wild onion and broadleaf weeds	Apply when wheat is in the hard dough (30% or less grain moisture) stage. Ester formulation may be more active on garlic. Underseeded legumes will be severely injured. Do not graze within 2 weeks after application. Do not use treated straw for livestock feed. If the 0.5 lb. ai/A rate is used, do not plant soybean for 7 (ester) or 15 days (amine) after planting. If the 1 lb. ai/A rate is used, do not plant soybean for 30 days after application.
Glyphosate (Roundup and other formulations)	16 to 32 oz./A the 3 lb. acid equivalent formulation, 11 to 22 oz./A of Roundup Weathermax	Suppression of grass and broadleaf weeds	Apply when small grains are in the hard dough stage. Do not apply to wheat grown for seed. Stubble can be grazed immediately after harvest.
Clarity	8 oz./A	Suppression of broadleaf weeds	Apply when wheat is in the hard dough stage and green color is gone from stem. A waiting period of 10 to 14 days is required before harvest. Do not graze or use feed from treated area. Do not plant soybean for 14 days after application.
Weedmaster/Brash	2 pints/A	Suppression of broadleaf weeds	Apply when wheat is in the hard dough stage and green color is gone from stem. Apply at least 7 days before harvest. Do not use treated wheat for seed unless a germination test is performed on the seed.

Postemergence Control of Grass Weeds in Field Corn – (*Bill Johnson, Glenn Nice, and Tom Bauman*)

Corn is growing rapidly across much of the state and control of grass weeds with postemergence herbicides is a question we are getting quite frequently. Although several of the postemergence grass herbicides are effective on large weeds, an important point to keep in mind is that most of these herbicides should be applied before the grass weeds are 4 inches tall (except for shattercane and johnsongrass) to assure the most effective control and to minimize yield losses due to weed interference. If soil-applied herbicides are not adequately controlling grassy weeds or if one is utilizing postemergence strategies for grass control, several herbicides are available that are labeled for postemergence grass control in corn.

Herbicides for grass control include Accent, Basis, Basis Gold, Beacon, Celebrity Plus, Equip, Liberty, Lightning, Northstar, Option, Steadfast, Steadfast ATZ and glyphosate products. To avoid crop injury and yield loss, many of the herbicides that contain an ALS inhibitor (Accent, Accent Gold, Basis, Basis Gold, Beacon, Celebrity Plus, Lightning, Northstar, Option, and Steadfast) should not be broadcast over the top of corn after it has 5 or 7 exposed leaf collars. This is the growth stage of corn when reproductive processes are initiated, and disruption of the physiology of corn at this stage can result in incomplete pollination, malformed ears (pinched ear syndrome) and yield losses.

Accent can be applied as a broadcast spray on corn that is up to 20 inches tall or has up to 6 exposed leaf collars, or it can be applied as a directed spray to corn that is 20 to 36 inches tall or exhibits 9 or fewer exposed leaf collars. Do not apply to popcorn or seed corn that is more than 20 inches tall. Accent controls most annual grasses, except for crabgrass, and also controls johnsongrass and shattercane. The best results will be obtained when it is applied to foxtails, barnyardgrass, and fall panicum 2 to 4 inches tall; shattercane and seedling johnsongrass 4 to 12 inches tall; and rhizome johnsongrass 8 to 18 inches tall.

Basis can be applied as a broadcast spray on corn in the spike through the 4-leaf or 2-exposed-collar growth stage. Do not apply to corn that has 3 fully exposed leaf collars or is more than 6 inches tall. Apply to foxtails and fall panicum up to 2 inches tall.

Basis Gold can be applied as broadcast sprays on corn that is up to 12 inches tall or before 6 exposed leaf collars are present, whichever occurs first. These herbicides control most of the same grasses that are controlled by Accent alone, but the Accent rate in both products is lower than typically used with Accent alone. Thus, they should be applied earlier to smaller grass weeds for effective control. Basis Gold has slightly more activity on smooth and large crabgrass than Accent beccause of the atrazine in Basis Gold. Apply to foxtails, barnyardgrass and fall panicum 3 inches tall or less; shattercane 6 inches tall or less; and seedling johnsongrass 8 inches tall or less. Additional Accent or Beacon can be added either as a tankmix or sequentially for additional activity on shattercane and johnsongrass.

Beacon can be applied as a broadcast spray to corn that is between 4 and 20 inches tall or has 2 to 6 exposed leaf collars, or up to tasseling if using drop nozzles. Applications to corn less than 4 inches tall can be injurious to the crop. All applications to inbred lines and popcorn should be directed between the rows to avoid placement in the whorl. Beacon provides control of johnsongrass and shattercane but is weaker than Accent, Option, Equip, and Steadfast on most annual grasses. Apply to shattercane or seedling johnsongrass 4 to 12 inches tall, and rhizome johnsongrass 8 to 16 inches tall.

Celebrity Plus can be applied as a broadcast spray on corn that is between 4 and 24 inches tall or up to 6 exposed leaf collars, whichever comes first. Applications to corn less than 4 inches tall can be injurious to the crop. Since Celebrity contains Accent, it should be applied to foxtails, barnyardgrass, and fall panicum 2 to 4 inches tall; shattercane and seedling johnsongrass 4 to 12 inches tall; and rhizome johnsongrass 8 to 18 inches tall.

Equip can be applied as a broadcast spray to corn that has up to 5 exposed leaf collars. It can be used as a directed spray with drop nozzles on corn up to 36 inches tall or 8 exposed collars. Equip is much like Accent and controls many of our common annual grasses plus johnsongrass and shattercane. The best results will be obtained when it is applied to foxtails, barnyardgrass, and fall panicum 2 to 4 inches tall, and shattercane and johnsongrass up to 8 inches tall.

Liberty can be applied as a broadcast spray on Liberty Link corn that is up to 24 inches tall or has up to 7 exposed leaf collars, or it can be used as a directed spray on corn that is 24 to 36 inches tall. **Liberty ATZ** can be applied to corn up to 12 inches tall. Liberty is very effective on large foxtails up to 10 inches tall, but it can be weak on barnyardgrass and yellow foxtail if they are more than 4 inches tall at application. Apply to shattercane and seedling johnsongrass that is 6 inches or less in height.

Lightning can be applied as a broadcast spray on Clearfield, IMI, IT or IR corn that is up to 20 inches tall or has 2 to 6 exposed leaf collars. Lightning controls many of the same grasses as Accent. Apply Lightning to giant foxtail up to 6 inches tall; green and yellow foxtail and fall panicum up to 3 inches tall; and shattercane, seedling and rhizome johnsongrass up to 8 inches tall.

Northstar can be applied as a broadcast spray to corn that is between 4 and 20 inches tall or has 2 to 6 exposed leaf collars, or with drop nozzles to corn up to the tasseling stage. Applications to corn less than 4 inches tall can be injurious to the crop. Northstar contains Beacon which provides control of johnsongrass and shattercane but is weaker than Accent, Option, Equip or Steadfast based herbicides on most annual grasses. Apply to shattercane or seedling johnsongrass 4 to 12 inches tall, and rhizome johnsongrass 8 to 16 inches tall.

Option can be applied as a broadcast spray to corn that is up to 16 inches tall or has 5 exposed leaf collars. It can be used as a directed spray with drop nozzles on corn that is 16 to 36 inches tall. Option is much like Accent and controls many of our common annual grasses plus johnsongrass and shattercane. The best results will be obtained when it is applied to foxtails, barnyardgrass, and fall panicum, 2 to 4 inches tall, and shattercane and johnsongrass, 12 to 16 inches tall.

Most Glyphosate products (see label to determine if a specific product is labeled for use on Roundup Ready corn) can be applied as a broadcast spray to Roundup Ready corn that is up to 30 inches tall or has 8 exposed leaf collars. A number of products can be applied to the Roundup Ready Corn 2 line up to 48 inches tall to keep spray out of the whorls. Apply to foxtails, up to 20 inches tall, and fall panicum, shattercane, and johnsongrass, up to 18 inches tall. Several glyphosate premixes can be applied postemergence on Roundup Ready corn as well. **Expert** can be applied to corn up to 12 inches tall, **Field Master** can be applied to corn up to 11 inches tall, **Ready Master ATZ** can be applied to corn up to 12 inches tall.

Steadfast can be applied as a broadcast spray on corn that is up to 20 inches tall or has 6 exposed leaf collars. Do not apply to popcorn, sweetcorn, or seed corn. Steadfast controls many of the same grasses as Accent, but it also has some activity on crabgrass. **Steadfast ATZ** can be applied to corn up to 12 inches tall or 6 exposed collars. Apply either product to foxtails, fall panicum, and barnyardgrass, up to 4 inches tall; johnsongrass, up to 8 inches tall; shattercane, up to 6 inches tall; and crabgrass, up to 1 inch tall.

Other Considerations:

1) Check the label to determine if these products can be used on popcorn, seed corn, sweet corn. The information presented in this article is specific to use on field corn.

2) Be sure to use the appropriate adjuvant with these products, particularly when tankmixing with other products for broadleaf weed control. Certain adjuvant systems will increase the activity of these herbicides and the potential for crop injury. Occasionally, different adjuvant systems are required for grass:broadleaf tankmixes versus specific products used alone.

3) Check the label to determine if restrictions exist regarding the use of soil or postemergence insecticides with postemergence grass herbicides. Some insecticides slow the corn plants ability to metabolize (or detoxify) these herbicides and crop injury can result. You may not have planned to use a postemergence grass herbicide and use of certain herbicides may not be allowed after certain soil insecticides.

4) This is the time of the year when we will begin to see spray tank contamination problems. If glyphosate was used in the previous load, be sure to properly clean out the tank and empty the sumps. Corn that doesn't not contain the Roundup Ready gene is very sensitive to low rates of glyphosate and the resulting crop injury is sometimes confused with injury from ALS herbicides such as Accent, Option, Equip, Steadfast, etc.

5) There are a number of websites available to quickly obtain information from herbicide labels.

a. CDMS <www.cdms.net/pfa/LUpdateMsg.asp>
b. Kelly Solutions<www.kellysolutions.com/>
c. Office of the Indiana State Chemist <www.isco.purdue.edu/>

Plant Diseases

Soybean Rust Update - (*Gregory Shaner*)

- What's happening?

The good news is that not much is happening with soybean rust. There is a lot of scouting activity in the South, but so far I have seen no reports of soybean rust in a commercial soybean field anywhere in the U.S. There was a finding of rust on some volunteer soybean in southwest Georgia about 3 weeks ago, but apparently this was an isolated occurrence.

Rust on soybean in Indiana will come from spores produced in southern regions of the country, or even possibly Central America or the Caribbean. The absence of a buildup of rust in these areas means that there are few spores at this time that can be carried north into Indiana and other Corn Belt states. Rust will probably have to become much more widespread and severe on southern soybeans before there is enough inoculum to reach us.

When and if spores arrive from the south, the initial infections in Indiana soybean fields are likely to be light. These initial infections will produce pustules, which in turn will produce more spores. This sets off the cycles of reproduction by the fungus, which allows the disease to reach damaging levels. The damage to our soybean crop will depend on how early in the season the first spores arrive, and how favorable local weather is for continued development of rust. The longer we go before the first spores arrive, the less risk there is for a severe epidemic.

We're certainly not out of the woods yet. There is still a lot of time left in the growing season, and plenty of time for rust to cause damage. Our soybeans are still in the early vegetative stage, or just emerging, and with the cool weather, they are not progressing very rapidly.

The USDA has a public web site that has information about the development of rust in the U.S. The URL is <www.usda.gov/soybeanrust>. At the bottom of the page at this site there are "Spotlights," one of which is "Public USDA Soybean Rust Web Site." Clicking on this will bring up a map of observations of rust. Counties where people have looked for rust and not found any are colored green. Counties where rust has been found this year are colored red. Beneath the map is a national commentary. Above the map is a question mark icon. If one selects this and then selects a state, the national commentary will be replaced with commentary specific for that state.

I am the person responsible for writing commentary for Indiana and adding color to the counties as I scout fields and sentinel plots or receive information from others who are scouting. Anyone who has information that might be included should pass it along to me, at shanerg@purdue.edu or 765-494-4651.

Wheat Stripe Rust – (*Gregory Shaner*)

- The disease may be more common in Indiana this year.

Stripe rust is evident in many wheat fields this year. Historically, in the U.S. this rust has been a problem mainly in the Pacific Northwest and California. However, in recent years it has often been severe in soft red winter wheat in the South, particularly in Arkansas. For the past several years it has occurred in Indiana, but has not been a problem.

There are three rusts of wheat: stem rust, leaf rust, and stripe rust. Stem rust does best at high temperatures, leaf rust at moderate temperatures, and stripe rust at low temperatures. For several decades, leaf rust has been the greatest threat to soft red winter wheat in Indiana, and generally throughout the soft wheat region. The varieties that have been grown over the past 5 decades mature early enough that they usually escape stem rust. They mature before temperatures are really favorable for this disease. Likewise, the transition from winter to summer is usually too brief for stripe rust to develop. This year and last year, the persistence of cool weather through May has allowed time for stripe rust to develop, so we have seen more of it than usual.

Stripe rust can be distinguished from leaf rust or stem rust by the pattern and color of pustules. As the disease name implies, the pustules form in long stripes (See figure). Major veins in the leaf restrict the lateral development of the fungus within the leaf, so the width of the stripes is the distance between these veins—only about 1/16 inch. But, the stripes can grow to be quite long, up to 2 or 3 inches. The leaf- and stem rust fungi produce isolated pustules. Stripe rust pustules are more yellow than orange, which also distinguishes this rust from leaf rust or stem rust (in Europe stripe rust is known as yellow rust). Another feature that distinguishes stripe rust from the other two rusts is its tendency to develop "hot spots." The overall level of rust in a field may be low, but there will be spots where the disease is very severe. Multiple stripes develop on the leaves, turning them almost entirely yellow. As the stripes age, the leaves die prematurely.

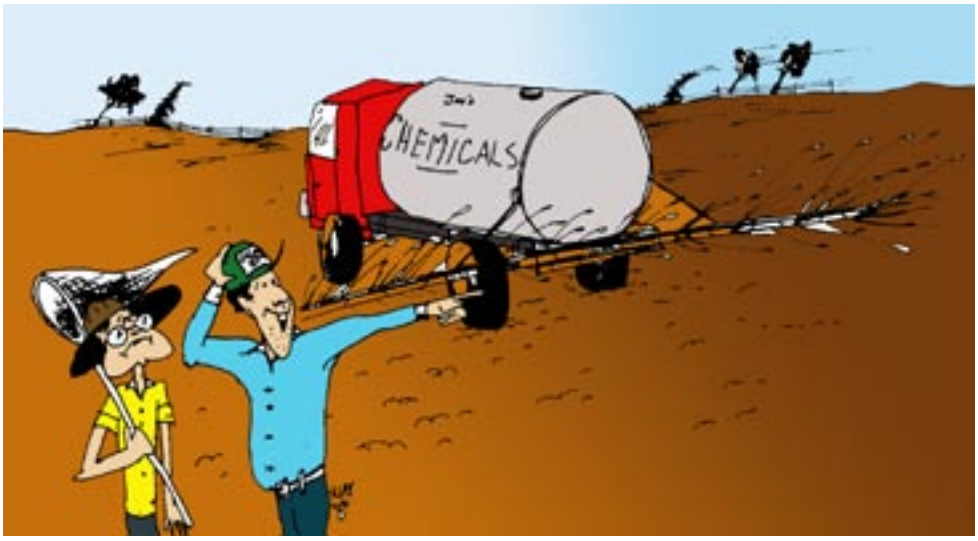
Many of our wheat varieties are susceptible to stripe rust. The disease is of such sporadic occurrence that breeders have not put nearly as much effort into development of resistance as they have for leaf rust. Nonetheless, observations in variety trials suggest that some varieties are resistant to stripe rust, or at least less susceptible than others.

Once weather becomes warm (highs in the 80s) development of stripe rust ceases. The mild winters and long, cool springs in the Pacific Northwest are the reason that stripe rust is much more of a problem there than in the Great Plains and eastern soft wheat region of the U.S. Our springs are usually too brief to provide a long enough period of optimal temperatures for stripe rust to become severe.

There is speculation among wheat pathologists that the stripe rust fungus in the southern and central U.S. may be a strain or strains that have adapted to warmer conditions than the rust in the West. This is being investigated, but it's too early to say that stripe rust is becoming a real threat in the central soft wheat region. However, if stripe rust appears to be widespread in a field this year, it might be a good idea to avoid that variety in the future. All of the wheat in Indiana is well past the full head emergence stage of growth (Feekes 10.5), so there are no fungicides that can be applied now. Even if there were, it is doubtful that an application this late would provide any benefit.

Stripe rust on wheat

Bug Scout



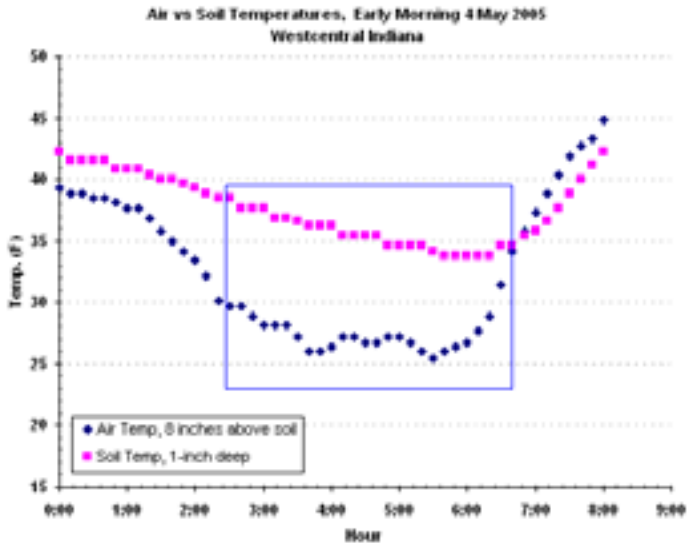
Oh, he's not spraying here...he's spraying way over there!

Agronomy Tips

A Tale of Two Plants - (*Bob Nielsen*)

Corn planted in early April in Indiana was injured to varying degrees by a combination of cold temperatures and frost injury that occurred from late April through early May. Air temperatures on the morning of May 4 were particularly cold, officially dipping to 28°F for a brief period of time at the Purdue Agronomy Farm near West Lafayette (PAAWS, 2005).

Official NWS air temperatures are measured five feet above the ground. One of my own temperature sensors located 8 inches above the soil in my planting date plots at the Crop Diagnostic Training Center recorded temperatures lower than 28°F for 2.5 hours and bottomed out at 25.5 to 26.5°F for about 30 minutes.



The good news for the corn plants was that soil temperatures did not similarly bottom out at sub-30°F temperatures. A temperature sensor located 1-inch below the soil surface (about the depth of a corn plant's growing point) indicated that temperatures never dropped lower than about 34°F. Consequently, most of the injury from frost or freezing temperatures was limited to the above-ground leaf tissue and not to the below-ground growing point regions of the corn plants.

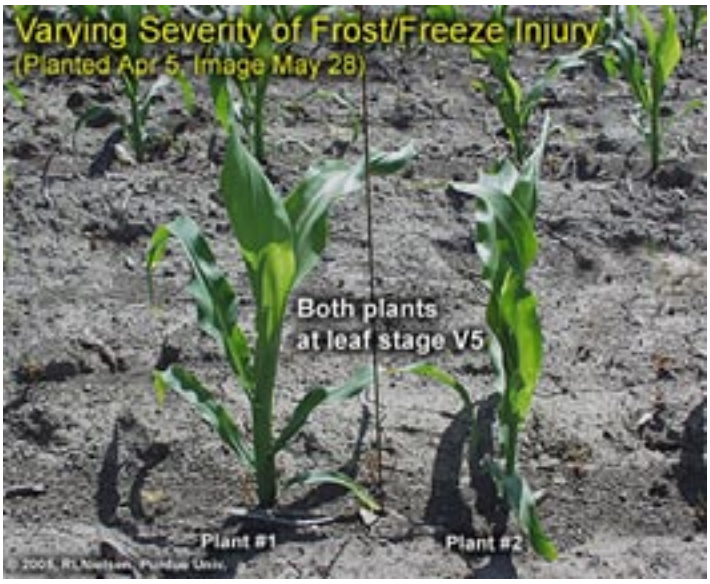
The good news with injury that is limited to above-ground leaf tissue of young corn plants is that whorl recovery can usually occur with negligible long term effects on the crop. The following images depict a time sequence of recovery from frost/freeze injury to two adjacent corn plants in a plot planted 10 April. The plants differ dramatically for severity of visible damage to the above-ground leaf tissue, yet both eventually recover similarly.

Gallery 1: Pair of plants, one more severely injured by frost/freeze than the other.

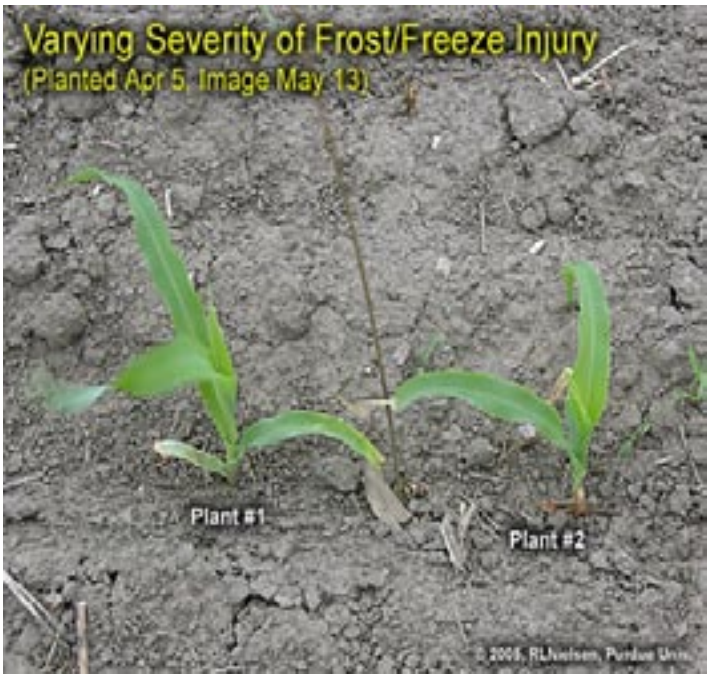
Visible frost/freeze injury to two V1 corn seedlings the evening of May 4, one more severely injured (right) than the other.

Beginning recovery of whorls 48 hours later on the evening of May 6.

Continued recovery evident six days later on the evening of May 10.



Appearance of plants twentyfour days later on May 28. More severely damaged plant slightly smaller than other, but both at leaf stage V5.



Appearance of plants nine days later on May 13.

Related References

Purdue Automated Agricultural Weather Stations Network. 2005. Available online at <http://shadow.agry.purdue.edu/sc.zen-geog.html> [URL verified 5/31/05].

Nielsen, R.L. (Bob). 2005a. I've Got The Corny Stand Establishment Blues…. Corny News Network, Purdue Univ. Available online at <www.kingcorn.org/news/articles.05/StandEstablishment-0503.html> [URL verified 5/31/05].

For other Corny News Network articles, browse through the CNN Archives at <www.kingcorn.org/news/archive.html>. For other information about corn, take a look at the Corn Growers' Guidebook at <www.kingcorn.org>.

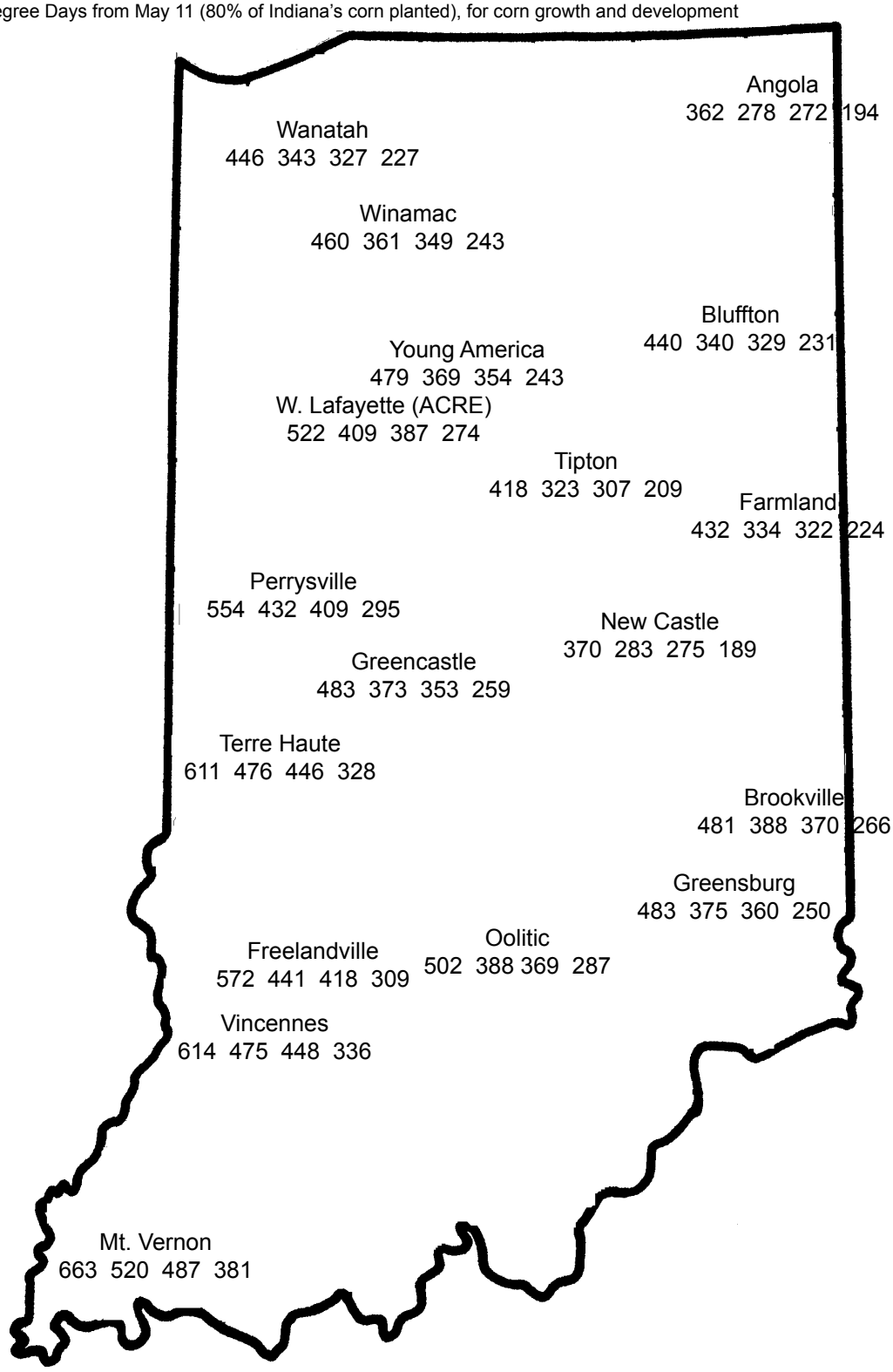
Weather Update

Temperatures as of June 1, 2005

MAP KEY

Location
GDD(10) GDD(35) GDD(55) GDD(80)

GDD(10) = Growing Degree Days from April 15 (10% of Indiana's corn planted), for corn growth and development
GDD(35) = Growing Degree Days from April 27 (35% of Indiana's corn planted), for corn growth and development
GDD(55) = Growing Degree Days from May 4 (55% of Indiana's corn planted), for corn growth and development
GDD(80) = Growing Degree Days from May 11 (80% of Indiana's corn planted), for corn growth and development



4" Bare Soil Temperatures 6/01/05

Location	Max.	Min.
Wanatah	88	61
Columbia City	72	60
W. Lafayette	81	65
Farmland	79	61
Butlerville	72	60
Vincennes	78	67