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In This Issue

Insects, Mites, and Nematodes

- Perfect Weather for Seed Damaging Insects
- Black Cutworm Adult Pheromone Trap Report
- Insecticide Restrictions When Replanting Corn
- Black Light Trap Catch Report

Agronomy

- Wheat Yield Response to Cold Stress
- I've Got the Corny Stand Establishment Blues...
- Stress Continues for Corn Growing Under Refrigerated Conditions

Bits & Pieces

- Purdue Forage Day

Weather Update

- Temperature Accumulations

Insects, Mites, And Nematodes

Perfect Weather for Seed Damaging Insects - (John Obermeyer, Christian Krupke, and Larry Bledsoe)

- Slow crop emergence increases feeding opportunities for seed attacking insects
- Stand reductions can be caused by many factors, be certain that reductions are due to insects before making treatment decisions
- Replanting may require a seed treatment or soil insecticide depending on pest and soil temperatures

Over the last month it has been the “best of times and worst of times” for crop growth and development. Indiana Agricultural Statistics reports that over 50% of the corn and 11% of state’s soybean acres are planted. Those few emerged fields are off-color and obviously waiting for warmer temperatures. Many sprouts have yet to emerge after sitting for 3 weeks. This is the “perfect storm” for below ground insect damage and stand reductions.

As the crop slowly appears, growers may notice uneven emergence. Field inspections may reveal seed or sprouts that have been invaded or fed upon by seedcorn maggots, seedcorn beetles, and/or wireworms. If the culprit is no longer present, one can usually tell by the type of

damage as to which pest was present. Damage from these insects varies from tunneling into the seed to the seed being completely hollowed out. Obviously, at this point there are no rescue treatments. However, it is important to remember that there are several other factors that can lead to stand reductions including planter malfunctions, seedling diseases, and pesticide damage to seeds. If replanting does become necessary where insects caused the problem, seed treatments or insecticide decisions should be based on several factors: the damaging insect, is the pest still



Seedcorn maggot damaged seed



Grub damaged mesocotyl



Wireworm damaged seedling

present and actively feeding (do some digging), predicted soil temperatures and plant growth rate, and insecticide restrictions.

Replanting corn where wireworms are present requires the use of an in-furrow soil insecticide labeled for wireworm control or seed treated with higher rates of Poncho or Cruiser. These critters can be active well into June, justifying such a treatment. If a soil insecticide was used at planting, be aware of restrictions as to the amount of product that can be applied per season as stated on the label, see accompanying article. There are no soil insecticides or effective seed treatments labeled for wireworm in soybean where high populations exist.

When replanting corn or soybean for seedcorn maggot and/or seedcorn beetle consider the soil temperature. If conditions are expected to remain cool and crop emergence may take over a week, an insecticide seed treatment applied at planting is likely a wise investment. When warm soil temperatures are present or expected, then seed treatments may not be necessary as the fast germination and growth rate of the plant will be sufficient to protect it from injury.

Black Cutworm Adult Pheromone Trap Report			
Week 1 = 4/21/05 - 4/27/05 Week 2 = 4/28/05 - 5/4/05			
County	Cooperator	BCW Trapped	
		Wk 1	Wk 2
Adams	Roe/Mercer Landmark	1	3
Allen	Gynn/South Wind Farm	2	0
Benton	Babcock/AgroKey	2	-
Clay	Smith/Growers Co-op (Brazil)	0	-
Clay	Smith/Growers Co-op (Clay City)	0	-
Elkhart	Kauffman/Crop Tech Inc.	0	0
Fountain	Hutson/Purdue CES	0	0
Fulton	Jenkins/Fulton-Marshall Co-op	0	0
Gibson	Hirsch Farms	0	0
Greene	Maruszewski/Worthington Pioneer	2	3
Knox	Growers Co-op (Fritchton 1)	0	-
Knox	Growers Co-op (Fritchton 2)	0	-
Knox	Smith/Growers Co-op (Oaktown)	0	-
Lake	Kliene Farms (1)	2	1
Lake	Kliene Farms (2)	1	1
Marshall	Barry/Fulton-Marshall Co-op	0	0
Marshall	Shanks/Plymouth Pioneer	0	-
Newton	Babcock/AgroKey	0	-
Putnam	Nicholson/Consultant	3	1
Randolph	Boyer/Davis-Purdue Ag Center	0	0
Rush	Tacheny/Pioneer Hi-Bred	0	0
Shelby	Gabbard/Shelby Co. CES	-	-
Sullivan	Growers Co-op (Sullivan E)	0	-
Sullivan	Growers Co-op (Sullivan W)	0	-
Sullivan	Growers Co-op (New Lebanon)	0	-
Tippecanoe	Obermeyer/Purdue CES	5	2
Tipton	Johnson/Pioneer	6	1
Vermillion	Hutson/Purdue CES	0	0
Warren	Babcock/AgroKey	0	-
White	Reynolds/Vogel Popcorn	0	0
Whitley	Walker/NEPAC	0	0



Insecticide Restrictions When Replanting Corn - Bug Scout

(John Obermeyer, Christian Krupke, and Larry Bledsoe)

- Most soil insecticides have one-time use rate restrictions.
- Insecticide-treated seed can be used again.
- Carefully weigh the economic risk/benefit of reapplying with soil insecticides.

Should replanting corn be necessary, soil insecticides have restrictions as to the amount of product that can be applied per season as stated on the label. Because the label is the law, this is not to be exceeded. Of all the soil insecticides, Lorsban 15G is the only one you can legally reapply. The bottom line is that, if you choose to reapply a soil insecticide during replanting, it should be a different active ingredient from what you used the first time (exception is Lorsban 15G). Remember, insecticide boxes will have to be recalibrated for the new granular since all products are formulated differently. On the other hand, high rates of insecticide-treated seed, Cruiser and Poncho, can be reused in replanting situations.

When attempting to replant in the old row, the potency of the original soil insecticide probably will not provide sufficient control of rootworm larvae. How much of the original insecticide remains is at best a guess. So, if you're "feeling lucky," and you are confident of placing the new seed in the old treated row, relying on the original insecticide prevents another \$15+ investment in replanting costs. If replanting where high rates of insecticide-treated seed was used, either using the same treated seed or a soil insecticide will be needed for rootworm protection.



“Looks like that killing freeze came in waves!”



Black Light Trap Catch Report - (John Obermeyer)

County/Cooperator	4/19/05 - 4/25/05							4/26/05 - 5/02/05						
	VC	BCW	ECB	SWCB	CEW	FAW	AW	VC	BCW	ECB	SWCB	CEW	FAW	AW
Dubois/SIPAC Ag Center	0	0	0	0	0	0	5	1	0	0	0	0	0	3
Jennings/SEPAC Ag Center	0	2	0	0	0	0	0	0	0	0	0	0	0	1
Knox/SWPAC Ag Center	0	1	0	0	0	0	0	0	1	0	0	0	0	1
LaPorte/Pinney Ag Center	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lawrence/Feldun Ag Center	1	1	0	0	0	0	0	0	0	0	0	0	0	1
Randolph/Davis Ag Center	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Tippecanoe/TPAC Ag Center	0	0	0	0	0	0	3	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	1	0	0	0	0	0	6	0	1	0	0	0	0	2

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

Agronomy Tips

Wheat Yield Response to Cold Stress – (Shawn Conley)

Winter wheat is relatively tolerant to cold temperatures once winter dormancy is broken (Table 1). However as the wheat crop begins to progress through its developmental growth stages wheat becomes more sensitive to cold stress. The Indiana crop weather field crops report (week ending May 1st) indicated that 81% of the wheat acres in Indiana have jointed and 4% have headed. This indicates that a majority of the wheat crop is between the jointing and boot growth stages. Based on this morning's temperatures (May 3, 2005) that ranged from 28° to 41°F (average 32.5°F) across Indiana if your wheat crop was still in the jointing crop growth stage it likely avoided any significant damage. If the wheat crop in your area was either in the boot or heading stage you may consider taking a closer look at what air temperatures were on the morning of May 3rd and May 4th. If temperatures did not reach the injurious temperatures listed in Table 1 below then the wheat crop avoided any significant impact on yield. If the temperature threshold was reached, it may prove beneficial to scout a few of your wheat fields to look for crop injury caused by cold stress. As with corn and soybean it will take a few days of warm weather for the wheat crop to begin showing symptoms. In general, based on the temperatures given across Indiana and the associated crop growth stages it is unlikely that significant crop damage or yield loss has occurred.

and yellow after emergence then no damage has occurred (Image 3). If they appear white or whitish/brown then the floret may be sterile.

Heading: Crop injury at heading will possess similar symptoms as shown above. An additional symptom to look for is a light green or white frost ring which encircles the stem a few inches below the wheat head. Though this damage does interfere with nutrient uptake it does make the head susceptible to snapping and head loss.

For additional information on spring freeze injury to wheat as well as symptoms at other crop growth stages please review: Spring Freeze Injury to Kansas Wheat: C-646 <www.oznet.ksu.edu/library/crpsl2/C646.pdf>.

Table 1. Approximate injurious temperature needed to cause crop damage in winter wheat. (Minimum of 2 hours required at these temperatures to cause damage)

Growth Stage	Temp. for 2h	Yield Effect
Tillering	12°F	Slight to moderate
Jointing	24°F	Moderate to severe
Boot	28°F	Moderate to severe
Heading	30°F	Severe
Flowering	30°F	Severe
Milk	28°F	Moderate to severe
Dough	28°F	Slight to moderate

Source: spring Freeze Injury to Kansas Wheat: C-646 <www.oznet.ksu.edu/library/crpsl2/C646.pdf>.

Symptoms of Spring Freeze Injury:

Boot Stage: Examine the boot and leaves for yellow or water soaked appearance (Image 1). If this has occurred wheat heads may remain trapped in the boot and cannot emerge properly (Image 2). This is relatively common in wheat fields and does not necessarily indicate yield loss. If temperatures were extreme, examine the wheat anthers (male part of flower) which are located in the individual florets. If they are light green and turgid within the floret,



Image 1. Boot and leaf injury caused by frost damage.



Image 2. Wheat awns trapped in boot.



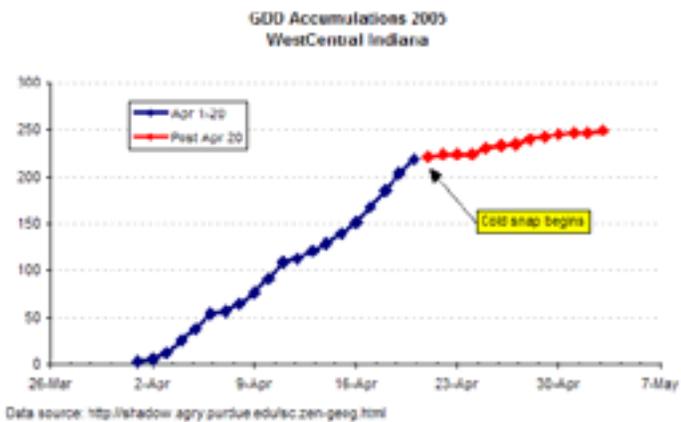
Image 3. Healthy wheat anthers emerge from floret.



I've Got The Corny Stand Establishment Blues... - (Bob Nielsen)

April began very warm but ended dimly cold and dreary. Because of the exceptionally warm beginning to April, growing degree day (GDD) accumulations for the month were actually greater than average (Indiana Ag. Statistics, 5/2/05). Corn planted near mid-month, however, has experienced primarily cooler than normal temperatures and many cloudy days to date.

April 2005 air temperatures in westcentral Indiana.



April 2005 growing degree day (GDD) accumulation in westcentral Indiana.



At the Purdue Crop Diagnostic Training & Research Center near W. Lafayette, corn planted on Apr 5 reached 50% emergence 13 days later on Apr 18, fairly quick for such early planting. Corn planted Apr 10 reached 50% emergence only 10 days later on Apr 20, reflecting the even warmer temperatures during that time period. Corn planted Apr 20, the day before the cold snap began, had germinated but not yet begun to emerge 13 days later (May 3).



Pre-emergence corn seedlings 13 days after Apr 20 planting.



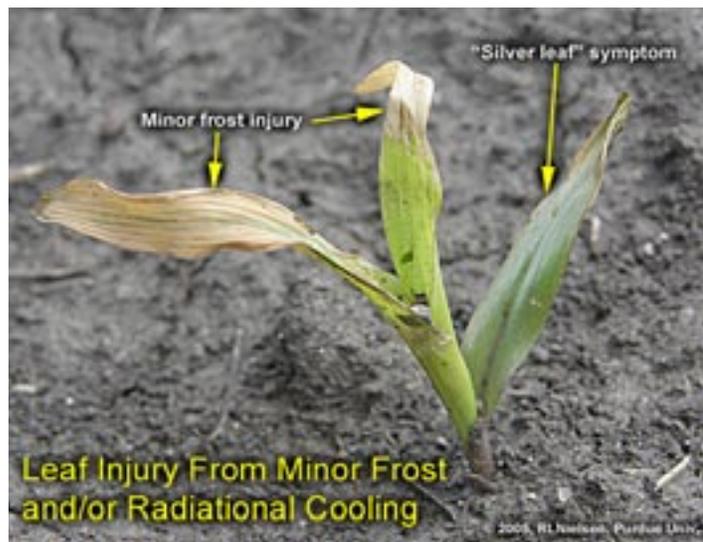
Pre-emergence corn seedlings 13 days after Apr 20 planting.



Pre-emergence corn seedlings 13 days after Apr 20 planting.

Recognize that these calendar times to emergence are in tune with what we would expect based on thermal time (accumulation of GDDs). The first two planting dates reached 50% emergence roughly 121 to 128 GDDs (using soil temperatures) after planting. As of May 3, cumulative GDDs for the Apr 20th planting were only about 60 or about half of what is required for emergence to occur.

Growers who planted corn during the first half of April are naturally concerned about the health of emerged stands (given the multiple occurrences of frosts and near-lethal temperatures coupled with sub-optimal temperatures and lack of sunshine) and wonder whether fields not yet emerged will ever do so. Some feel the emotional pressure to replant to put an end to their misery (the grower's, not the corn plants'). After all, those putrid yellow-brown-green plants surely can never recover to achieve their original yield potential, right?



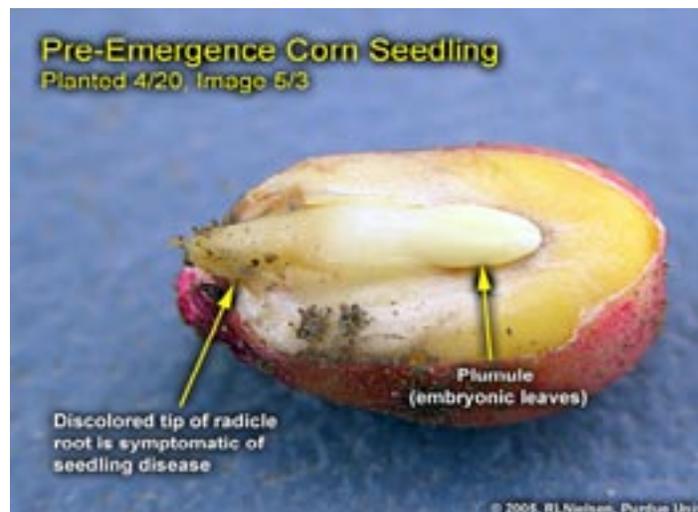
It is true that the combination of cold temperatures, light frost, often-cloudy weather, and (for some) saturated soils is not particularly favorable for rapid and uniform corn emergence or stand establishment. The cool, cloudy weather has also delayed overall crop development to the extent that it is very difficult to determine whether a stressed field will recover satisfactorily or will continue to deteriorate with eventual significant stand losses.

The warmer temperatures forecast for the latter part of this week will not only hasten the pace of crop development, but will also better enable growers to assess the condition of their early-planted fields. As I indicated in my most recent article (Nielsen, 2005), growers should not rush to replant these suspect fields. Here are some points to consider.

- Give fields the time to visually indicate whether they will recover. Under "normal" circumstances, 3 to 5 days after a damage event is sufficient to make this determination. This time around, it is requiring closer to 14 days to confidently assess stand health because of the lengthy cold snap we've been experiencing.

- Strive to accurately estimate the severity of any stand loss before pulling the replant "trigger". Make sure you estimate plant populations throughout a field, not just in one location next to the road. For 30-inch rows, multiply the number of plants in 17 ft. 5 in. of row by 1000 to estimate number of plants per acre.

- For some fields, the final "shoe" that may yet "drop" could be the eventual development of seed or seedling disease in these otherwise struggling early-planted corn fields once the effectiveness of seed-applied fungicide deteriorates 2 to 3 weeks after planting (Malvick, 2005). Continue to monitor fields over the next few weeks for such disease development.



- Use my replant worksheet (Nielsen, 2003) to estimate not only the possible yield returns to replanting, but also possible economic returns. Recognize that replanting does not occur without cost. Replant expenses (seed, fuel, herbicide, labor, etc) can easily outweigh the uncertain value of an uncertain yield gain and actually reduce your net dollar return.

- Do not simply "patch in" a suspect field if estimated surviving populations are greater than 25 to 50% of the original stand. The survivors can easily out-compete what you replant tomorrow. Instead, take the time to kill the existing stand before replanting (herbicide or tillage) or after planting with pre-emerge herbicide applications.

- If your original field was planted to RoundupReady™ hybrids, read Mark Loux's article (2005) that discusses the challenges of killing the original stand before replanting.

- If you have acres of corn or soybean yet to plant for the first time this season, concentrate on finishing that task before incurring the opportunity cost of replanting a suspect field of early-planted corn.

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Stress Continues for Corn Growing Under Refrigerated Conditions – (Bob Nielsen)

My contention earlier in the week (Nielsen, 2005) that little crop injury resulted from the low temperatures on the morning of 24 April has been tempered by what appears to be minor injury to exposed corn leaves during the clear-sky early morning hours on 25 April. Even though air temperatures dropped no lower than the mid-30's Monday morning, the sky was clear and the winds calm for at least 3 to 5 hours, setting the scene for minor frost and radiational leaf cooling. The latter event is the commonly attributed cause of the so-called "silver leaf" symptom more frequently observed on older corn (Nielsen, 2004).

The leaf damage that occurred Monday morning to emerged corn was not life threatening to the plants by itself and I am confident that most affected fields could recover satisfactorily with good growing conditions. However, the continuing cool (and often cloudy) weather this week has slowed overall crop development (including leaf expansion from whorls) and has changed previously green plants to a putrid yellow-green color. Coupled with minor injury to exposed leaves earlier in the week, the upshot is that fields that were appealing to the eye nearly a week ago can most politely be described now as "crappy".

Some growers are justifiably concerned about the prognosis for these "crappy" looking fields that also sustained low levels of leaf injury to minor frost or radiational cooling. As is often the case with crops, the prognosis depends on

the weather. Most fields would snap out of their doldrums upon a quick return to warm, sunny conditions. Continuation of cool, cloudy weather will further delay crop development as well as recovery from leaf injury.

Slow crop development following emergence also translates to slow establishment of the permanent nodal root system from the crown of the plants, thus lengthening the plants' dependence on the energy reserves of the kernels and increasing the consequences of exposure to other belowground stresses. Development of seedling diseases (Malvick, 2005) or insects feeding on the seed and mesocotyl (Steffey, 2005) prior to the successful development of nodal roots can be devastating to plant survival.

Don't rush to replant these "crappy" looking fields. The current cool weather will delay your ability to confidently assess recovery from leaf damage. Instead of waiting the usual 3 – 5 days to assess fields, it may take a week or longer. Furthermore, growers with corn acres yet to plant the first time around should concentrate on completing that task before replanting suspect fields. Before making a replant decision, consult my worksheet-formatted replant decision guide (Nielsen, 2003).

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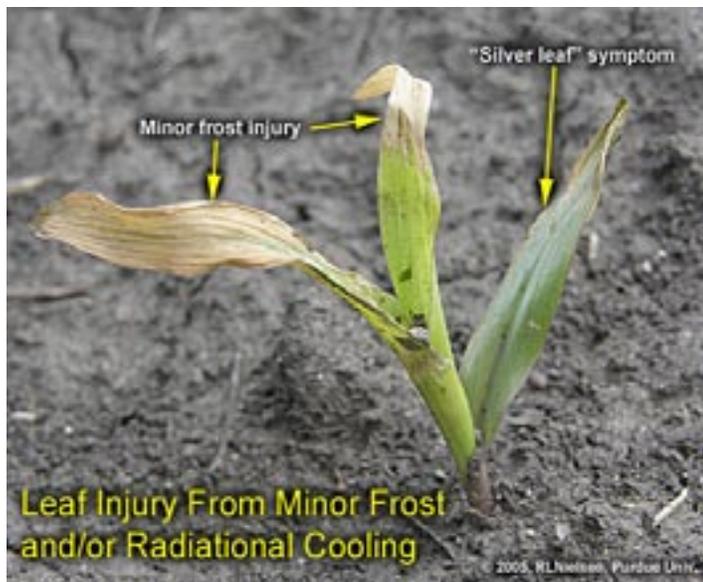
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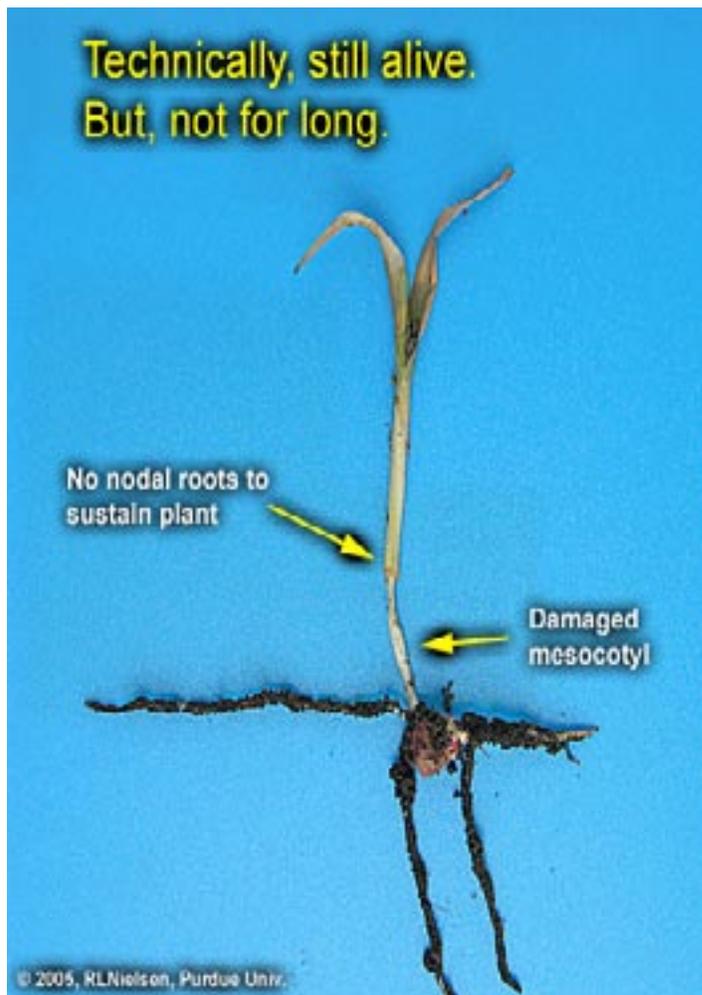
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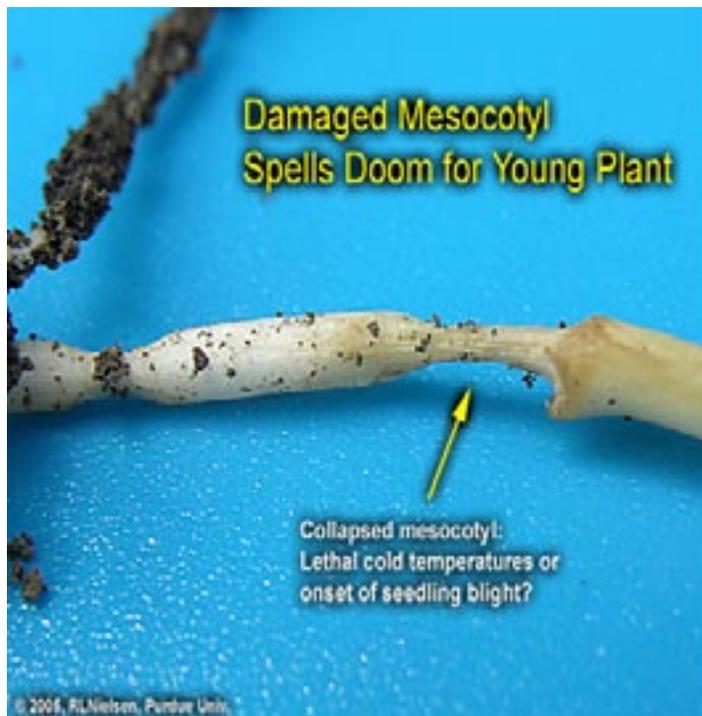
Leaf injury from minor frost and/or radiational cooling.



"Silver leaf" symptom descriptive of leaf tissue injury due to radiational cooling.



Frost-damaged plant that also shows early signs of disease to mesocotyl and kernel that would have eventually killed it.



Same plant as one above, showing closeup of disease symptoms on mesocotyl.



Frost-damaged plant showing damaged whorl tissue that may restrict further leaf expansion.

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.

Bits & Pieces

Purdue Forage Day – (Keith Johnson)

This year's forage day will be held on June 23, 2005 at Logansport, IN on **K & K Farms**. The website for the brochure and location is www.agry.purdue.edu/forageday/.

Background

This year's Forage Day is sponsored by the Purdue Cooperative Extension Service and the Indiana Forage Council. Forage Day combines educational workshops with equipment demonstrations. Presentations cover various topics in the production, utilization and marketing of forages. Forage Day is the only annual event in the state where one can see a live demonstration of harvesting equipment.

Why Participate

- Educational topics
- Equipment demonstrations
- Network with people of common interest
- Trade Show
- Hay quality contest

Hay Quality Contest

To participate in the contest, bring 1 unbroken bale of hay as your entry. A certificate will be awarded by the Indiana Forage Council and forage-related products will be provided by agribusinesses to the winner of each division (grass, legume, and mixed). Awards will be announced within 10 days following the Forage Day. No fee will be assessed for contest samples.

What the experts say

"The goal [of Forage Day] is to inform farmers on how to produce and utilize forages...It also gives farmers the opportunity to interact with producers of like interest, agribusiness personnel and university personnel."

"Seeing the different pieces of equipment perform side by side is especially helpful. I've always felt that if someone has a need to purchase equipment, the demonstrations would help him or her make a more informed decision"

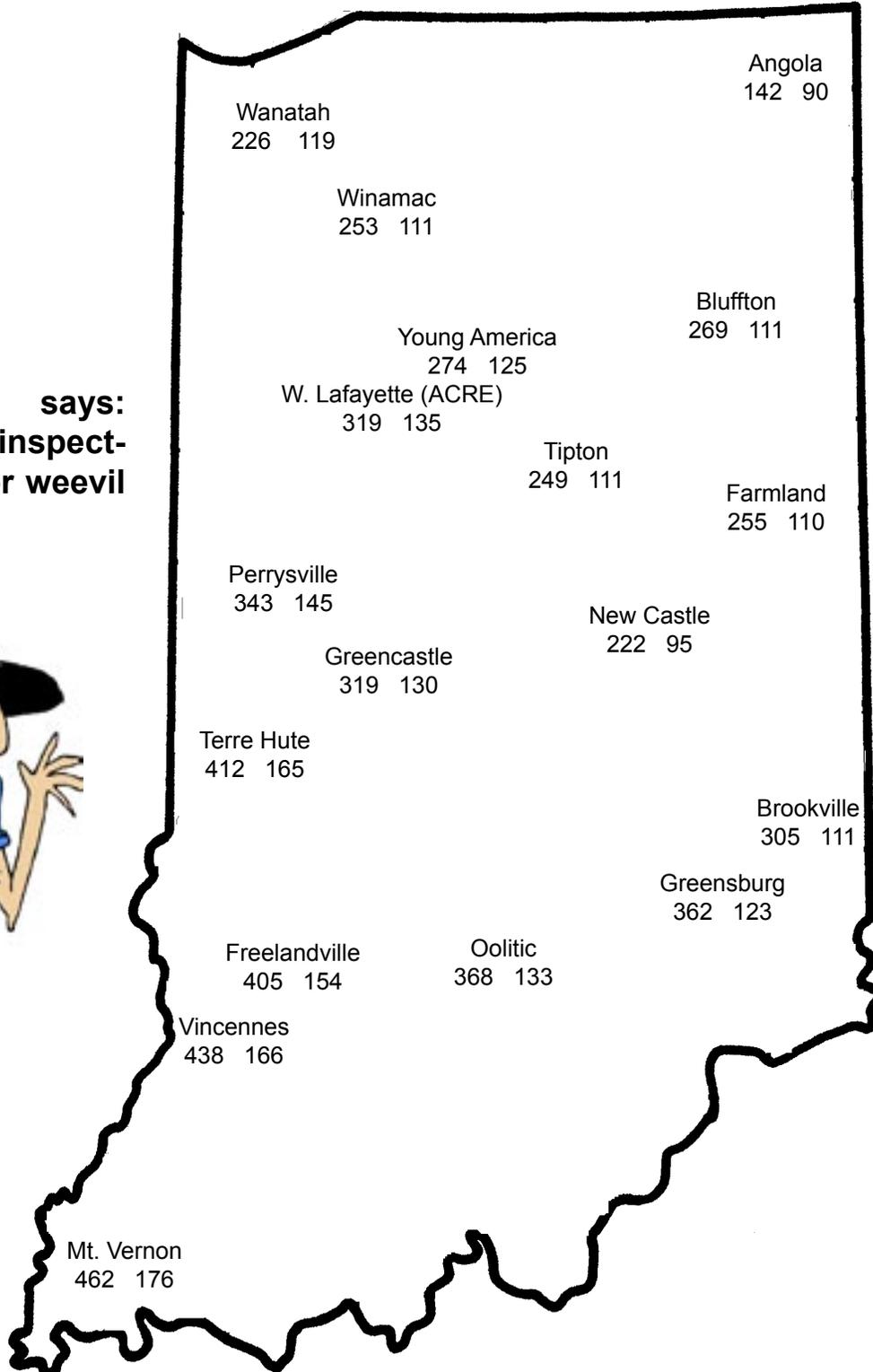
Weather Update

Temperatures as of May 4, 2005

MAP KEY	
Location	
HU48	GDD(10)

HU48 = heat units at a 48°F base from Jan. 1, for alfalfa weevil development (begin scouting at 200)
 GDD(10) = Growing Degree Days from April 15 (10% of Indiana's corn planted), for corn growth and development

**Bug Scout says:
 Don't forget inspect-
 ing alfalfa for weevil
 damage!**



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