Purdue Cooperative Extension Service

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In This Issue

Insects, Mites, And Nematodes

S.L.A.M. the 2005 Crop – (*Linda Mason*)

- Sanitation
- Loading
- Aeration
- Monitoring

The S.L.A.M. post-harvest IPM strategy is a systems approach to maximize grain quality. Its success depends on the proper selection of crop varieties, production and harvest practices, grain handling equipment, drying systems and storage management.

S.L.A.M. represents four simple steps sanitation, loading, aeration, and monitoring. Grain storage never improves grain quality! Thus, it is the objective of S.L.A.M. to maintain maximum post-harvest quality by protecting stored grains and oil seeds from weather, rodents, insects, self-heating, molds, mycotoxins, and pesticide residues. In addition, minimizing the deterioration process prevents spoilage, quality discounts, storage costs, and thus maximizes the return on every bushel harvested, dried and stored.

Sanitation

Proactive Steps include removing vegetation and maintaining a weed-free facility; clean handling equipment (combines, trucks, wagons, conveyors) after harvest, remove all grain spills; clean storage structures after emptying; disinfect storages inside and out before refilling; clean grain before binning using screens, scalpers, or perforated auger tubes; seal unloading auger, auger tube opening, and side door openings before harvest; and establish a written sanitation schedule

Preventive Benefits include: The chance of mold and insect development is reduced; the need for grain protectants is avoided; broken grain, foreign material, weed seeds, and fines are kept out of the bin;, aeration effectiveness is improved; and sealed openings prevent insect entry and cold air loss.

Loading

Proactive Steps include expanding the use of combination and slow drying methods; minimize grain transfer operations

by optimizing handling and storage systems; operate augers and elevators at capacity and slowest possible speeds; only store grain in aerated structures (bins, silos, tanks, flats); use a spreader to fill the bin; core the fines from the center of the grain; level peaked grain soon after harvest; record grain moistures going into storage; and screen for mycotoxins.

Preventive Benefits include reduced stress cracks and brittleness from overdrying of grain; airflow through clean grain is higher and more uniform; clean grain has a greater storability; and lower quality grain is identified and can be scheduled for earlier unloading.

Aeration

Proactive Steps include cooling dried grain uniformly to 30 - 35°F by mid-December; move cooling front completely through and out of the grain mass; maintain low grain temperatures as long as possible during storage; avoid rewarming of dry grain with fans during the spring and summer; run your fans judiciously, or install automatic fan controllers to help you; install adequate exhaust vents and avoid condensation on inside walls and roof; and seal fans when off to prevent early warm-up.

Preventive Benefits include longer storage life with cool grain; non-uniform moistures from high-temperature drying are equalized; savings in grain damage, moisture losses, residual pesticides, and fumigation expenses result; and adequate exhausting from the headspace minimizes condensation and maximizes airflow.

Monitoring

Proactive Steps include probing top grain layer with a thermometer to make sure cooling front has exited; install a temperature monitoring system; acquire and use grain sampling equipment (triers, probes, traps, sieves; check stored grain regularly for temperature, moisture, insects and molds; check binned grain every 3 - 4 weeks during cold months; check binned grain every 1 - 2 weeks during warm months; repair leaky roofs, seals, joints and holes; and never enter bin with flowing grain, or after partial unloading.

Preventive Benefits include temperature changes and moisture migration (damp grain) are detected early; heat generated (hot spots) by insect and mold activity can be counteracted early; wetting due to rain or snow entering the storage is avoided; peace of mind; and safety!

Bug Scout

"I think we have a problem!"

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

County/Cooperator	8/30/05 - 9/5/05							9/6/05 - 9/12/05						
	VC	BCW	ECB	SWCB	CEW	FAW	AW	VC	BCW	ECB	SWCB	CEW	FAW	AW
Dubois/SIPAC Ag Center								0	6	13	0	103	0	33
Jennings/SEPAC Ag Center	0	0	88	0	2	0	1	0	0	125	0	30	0	2
Knox/SWPAC Ag Center	2	3	13	1	5	0	6	1	2	8	0	4	0	2
LaPorte/Pinney Ag Center	0	0	110	0	1	0	2	0	0	291	0	11	0	2
Lawrence/Feldun Ag Center	0	1	36	0	12	0	12	0	3	39	0	73	0	8
Randolph/Davis Ag Center	0	0	24	0	8	0	3	0	3	72	0	15	0	11
Tippecanoe/TPAC Ag Center	0	2	542	0	28	0	4	0	3	412	0	84	0	4
Whitley/NEPAC Ag Center	0	2	73	0	0	0	2	0	0	58	0	0	0	8

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

Weeds

Fall Applied Herbicides for Soybean, Corn and Wheat – (*Bill Johnson and Glenn Nice*)

- When to apply fall herbicide treatments for soybean or corn.
- Treatments that can be used in front of either corn or soybean.
- Treatments that can be used in front of corn only.
- Treatments that can be used in front of soybean only.
- Wheat.

Now is the time to be thinking about fall treatments to control winter weeds. Although recent dry conditions across much of the state has limited winter weed emergence, we have observed cresleaf groundsel (butterweed), chickweed, and dandelion emergence in several fields. It would be advisable to scout fields that won't be tilled this fall to determine the level of winter weed infestations and determine if fall applied herbicide treatments are needed.

When to apply fall herbicide treatments for soybean or corn:

For control of winter annual weeds and dandelion, apply herbicide anytime between now and mid-November for best results. The best time to control winter annuals, biennials and herbaceous perennials such as pokeweed is going to be a bit earlier than the optimal timing for dandelion control. So you may need to make a judgment call on the fields that have dense infestations of annuals, biennials, pokeweed and dandelion. Dandelions can be effectively controlled with applications before a frost, but you will need to increase the rate of glyphosate to 1.1 to 1.5 lb acid equivalent per acre for optimum activity.

For any fall applied herbicide treatment the herbicide labels are very specific about not apply herbicides once the ground has frozen or is snow covered to minimize off-site movement . To prolong residual activity you should apply residual herbicides when soil temperatures have declined to 50 degrees F or below at a 2-inch depth. Residual activity provided by herbicides applied in the fall can be influenced by the weather during the winter months. Warm wet winter months can promote microbial activity and increase the breakdown of the herbicides in the soil, decreasing residual activity.

There are several products that are labeled for fall applications. For a larger list of fall applied herbicides see the 2005 Weed Control Guide for Ohio and Indiana <www.btny.purdue.edu/Pubs/WS/WS-16/>. An important consideration when choosing a fall applied program is to understand the strengths and weakness of the herbicide and inquire about the "clean field guarantee" offered by selected manufacturers. Some manufacturers may offer to respray fields in the spring if weed control is less than satisfactory. Unfortunately, we generally do not have access to this information making it difficult for us to sort through the benefits of specific programs. The information below highlights the herbicide treatments that have worked effectively across a broad range of weed species and environmental conditions in Indiana.

Treatments that can be used in front of either corn or soybean:

Glyphosate + 2,4-D controls most winter annuals, biennials, and also dandelion. A glyphosate rate of 0.38 to 0.5 lb of glyphosate acid should be adequate for most winter annuals, but rate should be increased to at least 0.75 lbs acid where dandelion and other perennials and biennials are present. Apply with ammonium sulfate. 2,4-D should be added if you think you have glyphosate-resistant marestail. A fall applied treatment of glyposate + 2,4-D won't be effective in suppressing spring emergence of winter annual weeds.

Valor + 2,4-D and Sencor + 2,4-D will control control many winter annual broadleaf weeds, but not biennial or perennial weeds. Sencor rate of at least 8 oz/A or a Valor rate of 2-3 oz/A should be used to provide meaningful residual activity, especially on spring emerging marestail. If chickweed is present, glyphosate or Express should be added to either Sencor or Valor.

2,4-D alone at 1 to 2 lbs ai/A will control many winter annual weeds, but not chickweed or grassy species. Add Express at 0.125 oz/A to control chickweed and provide some additional activity on dandelion seedlings . Add glyphosate to control grassy species and improve control of large dandelion.

Treatments that can be used in front of corn only:

Simazine (1 lb ai/A) + 2,4-D controls most winter annual weeds, but is less effective on dandelion and grassy weeds than Basis + 2,4-D or glyphosate + 2,4-D. Simazine does not provide much residual control of summer annual weeds the following spring, so expect to use a typical herbicide program in next year's corn.

Basis + 2,4-D will control most winter annual weeds and dandelion, and has more activity on grassy species than simazine + 2,4-D. Basis does not provide much residual control of summer annual weeds, so expect to use a typical herbicide program in next year's corn.

Treatments that can be used in front of soybean only:

Canopy EX + 2,4-D and CanopyXL + Express + 2,4-D will control most winter annual weeds and dandelion and provide residual activity into the spring. The minimum rate of Canopy EX should be 1.1 oz/A. Canopy EX is formulated with Express, but you should add 2,4-D for improved foliar activity on broadleaf weeds or add glyphosate if you have winter annual grasses or volunteer wheat. Rates of CanopyXL range from 2.5 to 4.5 oz/A based on soil type.

The 2.5 oz rate is adequate for control of emerged weeds in the fall, but higher rates can extend the length of weed control the following spring. Do not use more than 2.5 oz where soil pH is greater than 6.8.

Other products that we have evaluated in our research program and are labeled for fall applications to fields going into soybean include Gangster, Python, Scepter, and Synchrony XP. Gangster is a premix of Valor and FirstRate and would be a good choice for fields that have dense marestail infestations that emerge both in the fall and in the spring. Python and Synchrony XP would also provide some actitivity on marestail. Scepter would provide some residual activity on spring emerging summer annual weeds. Use of 2,4-D or glyphosate with all of these products is recommended to maximize foliar activity. If chickweed is present, glyphosate or Express will be needed to provide effective control of this weed.

Wheat.

Wheat planting will commence soon and many growers are utilizing no-till practices for wheat production. Although winter weed pressure at this time appears to be relatively light, it would be prudent to consider a fall treatment to control the seedlings that are present and reduce dandelion infestations. Dandelion control in wheat is becoming a more important issue and if it is not managed before wheat is planted we are left with fewer options after it is planted. Most 2,4-D product labels DO NOT support fall applications either before or after wheat is planted because of crop injury and yield loss concerns. Fall applied glyphosate, before wheat is planted, should be just as effective at controlling winter annuals and dandelion and would be the recommended tactic for control of weeds prior to planting. Other fall treatments that can be used in emerged wheat will be discussed in a subsequent article.

Cressleaf groundsel (Peckera glabella).
Photo by Glenn Nice.

Agronomy Tips

Corn Yield Trends for Indiana: 1930 to 2005 - (*Bob Nielsen*)

Historical grain yields provide us with a glimpse of yields yet to come, although like the stock markets, past performance is no guarantee of the future. State average corn grain yield in Indiana has increased at a fairly constant 1.6 bushels per acre per year since 1930 primarily due to improved genetics and production technology (Fig. 1).

Since 1995, Indiana's corn crop yield has split even, with half of those years below trend and half above. The current USDA estimate for 2005 puts the Indiana corn crop at 149 bushels per acre (bpa), or about 2 percent **above** the 2005 trend line yield of 146.4 bpa but about 11 percent below last year's record crop of 168 bpa (Fig 1). By comparison, recent years' departures from trend yield (Fig. 2) were 2004 (+16.0%), 2003 (+2.0%), 2002 (-14.5 %), 2001 (+11.5 %), and 2000 (+6.3 %). August 2005 corn production estimates for each crop reporting district in Indiana are available in text or graphical formats.

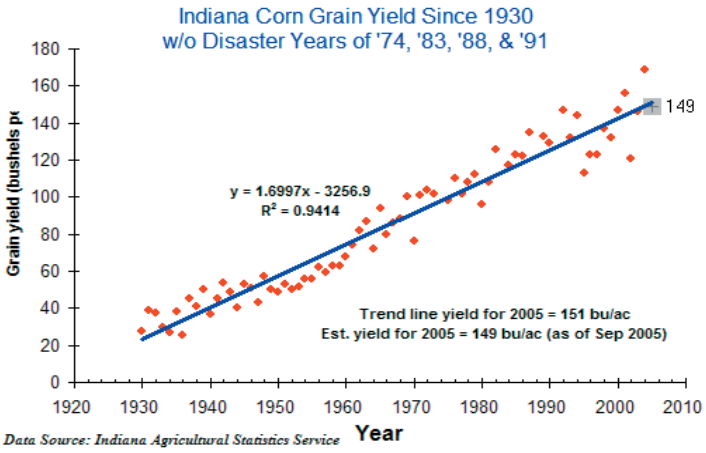

Fig. 1

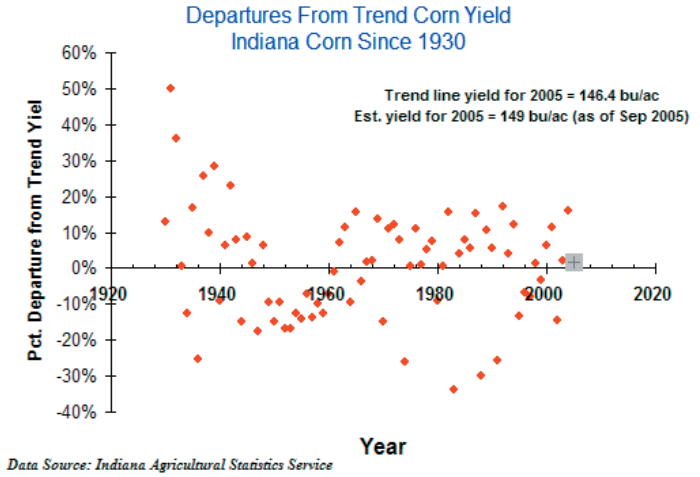

Fig. 2

Annual grain yield values fluctuate above and below the trend line throughout the more than 70 year period of records, but four disaster years are especially noteworthy. Late planting plus early fall frosts in 1974 resulted in state average corn yields 26% less than the trend value. Severe droughts in 1983, 1988 and 1991 resulted in yields 34%, 30% and 26% less than trend values.

Because the departures from trend for these four years are so dramatic, it is of some interest to calculate the trend line for corn grain yield without their inclusion. In so doing, the annual rate of yield increase is slightly greater (1.7 versus 1.63 bu/ac/yr) and the estimated trend yield for 2005 changes from 146.4 to 151.0 bpa (Fig. 3). Such values may be more true estimates of statewide yield potential in "normal" years.

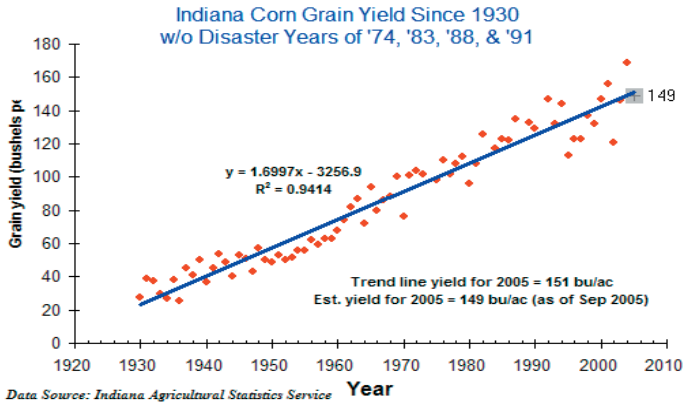

Fig. 3

The top five U.S. corn grain producing states are Iowa, Illinois, Nebraska, Indiana and Minnesota (Fig. 4). According to the final USDA production estimates for 2005, these five states (7.7 billion bushels) accounted for about 65 % of the total estimated grain yield for the U.S. in 2004 (11.8 billion bushels).

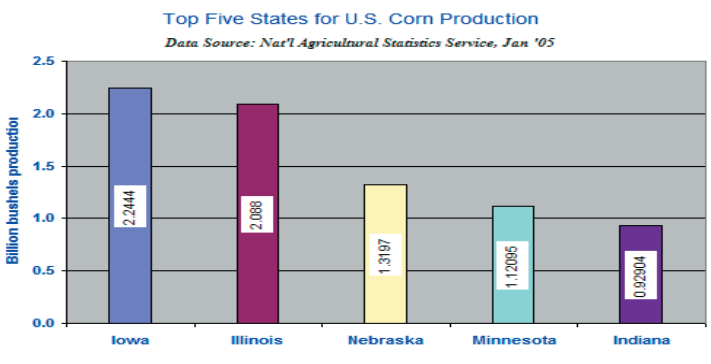

Fig. 4

For the first time in a number of years, corn yields per acre in 2004 for the U.S. Midwest rivaled those often obtained in more western areas of the U.S. (Fig. 5). Consistently high corn yields are more often achieved in western states such as Washington and Arizona because of their relatively better corn growing climates including a) fewer cloudy and hazy days, b) less rainfall and humidity contributing to less disease, c) availability of irrigation, and d) fewer stressful hot nights during grainfill.

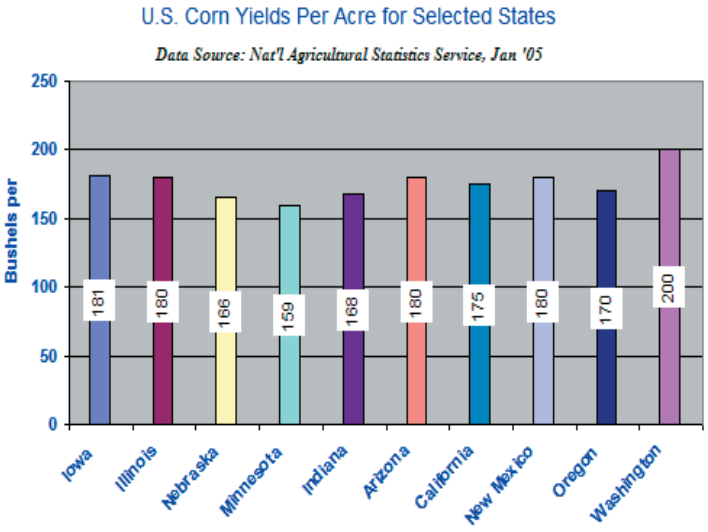

Fig. 5

For More Information...

For more statistics about Indiana agricultural production, browse the Web site of the Indiana Agricultural Statistics Service at <www.nass.usda.gov/in/>.

For more statistics on U.S. national crop production estimates, look at the National Agricultural Statistics Service Crop Production Web site.

Related References

USDA-NASS. Jan 2005. **Crop Production 2004 Summary.** United States Dept. of Agr - Nat'l Ag. Statistics Service, Washington, D.C. Online at <http://usda.mannlib.cornell.edu/reports/nassr/field/pcp-bban/cropan05.pdf> [URL verified 8/9/05].

USDA-NASS. 2005 (12 Sep). **Preliminary District Estimates - Indiana.** Indiana Field Office of USDA - Nat'l Ag. Statistics Service, W. Lafayette, IN. Online at <www.nass.usda.gov/in/pressrel/de091205.txt> [URL verified 9/12/05].

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>.

Fall Soil Sampling for Next Year's Crop – (*Robert Mullen, Maurice Watson, Ohio State University*)

As soybean harvest progresses, soil sampling probes should be getting shined up and readied for field activity. Soil sampling to determine soil nutrient status is one of the most economical management practices for crop production. Fall sampling should be done to determine the phosphorus, potassium, and soil pH status of soil. These values will be used to determine how much phosphorus (P), potassium (K), and lime should be applied this fall to prepare for next year's crop. This is especially important as fertilizer prices have increased. If soil analysis reveals the soil contains more P and K than the subsequent crops need, money that was ear-marked for those fertilizer materials can be used elsewhere.

Soil analysis is only as good as the sample that was collected. Utilizing proper techniques to collect soil samples are extremely important and can have dramatic impact on the recommendation. Collect 15 to 20 random 8 inch soil samples from a representative area to create a composite sample. Do not collect less than 15 samples for each area being sampled. This will ensure the sample truly represents the area of interest. Analytical labs in and around Ohio can be found at the following website: <http://agcrops.osu.edu/fertility/>.

After receiving the analysis from the lab, go the Tri-State Fertilizer Recommendations online to determine the rate needed to maximize production <www.ces.purdue.edu/extmedia/AY/AY-9-32.pdf>. Recommended rates of fertilization can also be found at: <www.agry.purdue.edu/mmp/webcalc/fertRec.asp> (this website is based on Tri-State Fertilizer Recommendations). If soil analysis reveals the soil is well above the established critical level, consider not applying that nutrient this fall. If below the critical level, the nutrient should be applied to ensure it is not yield limiting.

Soil sampling should be done at least every three years (if not on a shorter interval) to evaluate trends in soil nutrient status. Sampling the fall prior to spring corn planting is an excellent time to collect soil cores.

Bits & Pieces

Organic Farm Tour in Indiana

What: Tour a working organic grain, organic pasture, and intensive grazing livestock farm. Hear about markets for organic grain from Purdue Ag Economist Corinne Alexander. Learn from others interested in organic agriculture.

When: Monday, Sept. 26, 2005, 4:30 to 7:00 p.m. local time. Sandwiches and beverages provided.

Where: Langeland Farms, 3806 South County Road 550 East, Greensburg, Indiana. Gary Reding, President. (see flyer for directions - PDF file)

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Bug Scout

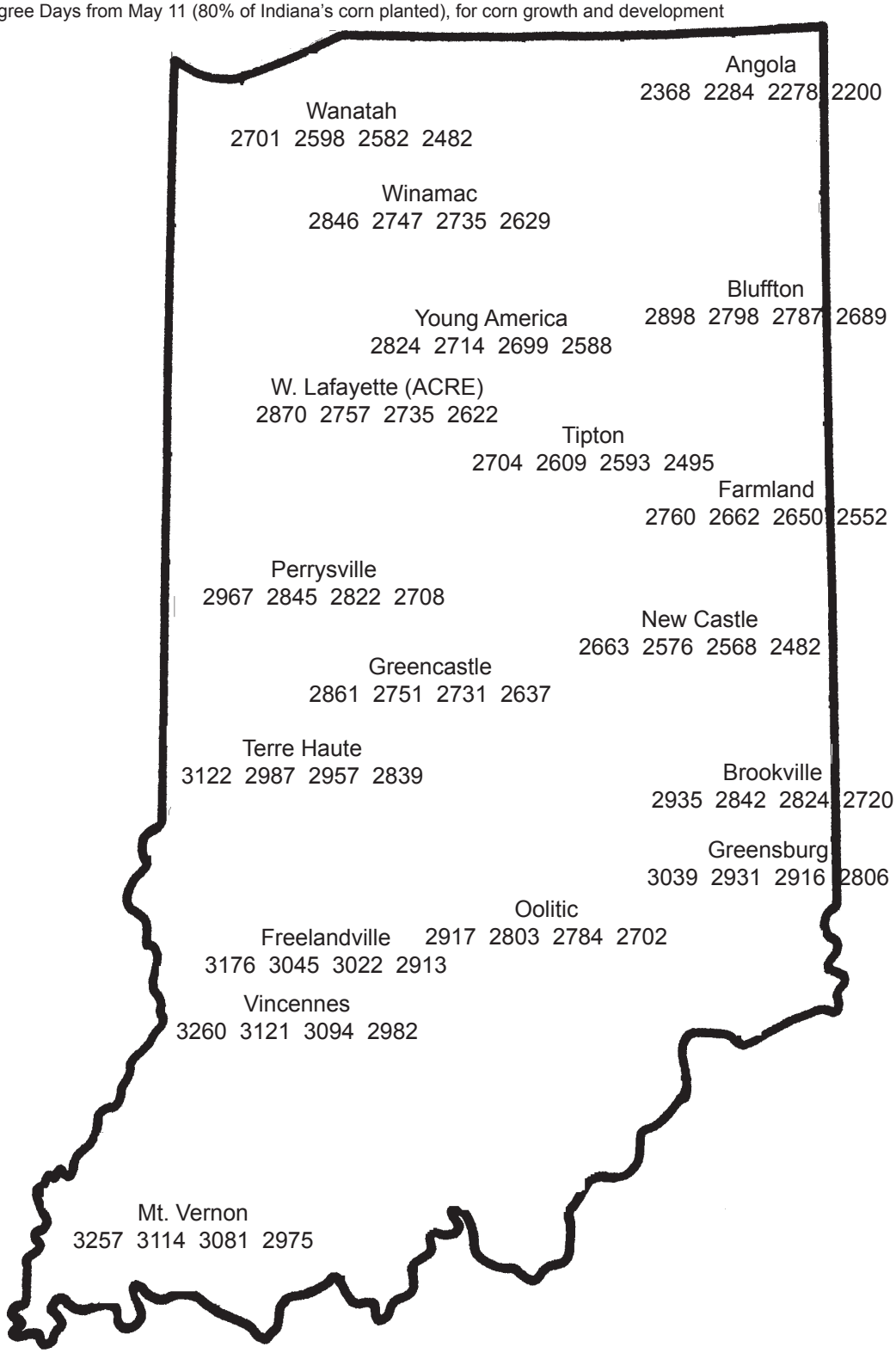
Have a safe and happy harvest!

Weather Update

Temperatures as of September 15, 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 9/14/05

Location	Max.	Min.
Wanatah	78	65
Columbia City	78	72
W. Lafayette	82	71
Farmland	78	70
Butlerville	82	70
Vincennes	88	78