Pest&Crop

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In This Issue

Insects, Mites, and Nematodes

Bean Leaf Beetle Resurgence in Some Soybean Fields – (*John Obermeyer, Rich Edwards, and Larry Bledsoe*)

- Significant beetles and leaf feeding in some fields
- Soybean can withstand up to 20% defoliation before economic
- Next generation of beetles will feed on pods

A large number of bean leaf beetle and their defoliation has been evident in several southern and central Indiana fields the past couple of weeks. Their feeding consists of small round holes throughout the soybean canopy, whereas Japanese beetle skeletonize foliage at the top of the plant. These beetles are now emerging from eggs laid in the soil by the overwintering adults that were so plentiful in some fields early this spring.

Soybean plants in the reproductive stage of growth (flowers and pods) can withstand up to 20% defoliation before economic losses occur. Remember, that one should determine the average defoliation level throughout the plants / area and that damage often appears worse than it really is.

The bean leaf beetle active now will mate, lay eggs and give rise to the second generation. These late emerging beetles potentially have the greatest impact on yield, that is by feeding on the pods. As the soybean plant begins to senesce, the beetles will switch feeding from the foliage to green pods. This is **not** suggesting that we treat soybean now to prevent pod feeding in later August and September. More on pod feeders in future issues of the *Pest&Crop*.

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The DTC Rootworm Dig – (*Troy Horton and John Obermeyer*) –

Participants at the Purdue Diagnostic Training and Research Center this July set out on the adventure we called "The Dig." These stalwart individuals were not dissuaded by the harsh elements (namely mud from the torrential downpour) in their relentless pursuit to rate corn roots damaged by rootworm. They accomplished this task with uncommon bravery and iron will. Despite their efforts, this dig only resulted in a total of 116 roots, whereas true research digs entail over 1000 roots per plot. This difference is due to the fact that this was intended to be a demonstration and was never designed to derive management making decisions or evaluate product performance. Take the following data and results with a grain of salt. As discussed during the session, true insecticide efficacy trials and evaluations require multiple fields and years of data.

DTC Rootworm Demonstration Dig and Root Ratings – July 2000

Treatment	Individual Root Ratings	Mean
Furadan	3,3,3,4,3,4,3,3,2,2,4,4,4,5,2,2,3,4,3,3	3.2
Regent	4,3,4,5,3,3,3,3,4,3,3,4,2,2,3,3,3,4,3,3	3.25
Pro-Shield	3,4,3,4,3,3,3,3,4,4,3,4,3,3,3,4,4,5,3,4	3.5
Capture	2,3,2,2,2,1,2,3,3,3,3,3,2,3,3,3,2,2	2.44
Control	2,4,2,2,3,3,2,4,3,4,3,4,4,3,3,3,4,3,2,2,2,3,3,4,4,5,2,2,3,3,3,5,4,3,3,3,2,3	3.07

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Southwestern Corn Borer Update – (*Ric Bessin, University of Kentucky*) -

Editor's note: the following article, gleaned from the *Kentucky Pest News*, July 31, 2000, should be of interest to producers in extreme southwestern Indiana counties.

The second distinct moth flight of the season was recorded in Princeton last week. This means that the second generation larvae will soon be attacking corn. It is this generation that will move to the bottom of the plant to overwinter. And it is these same larvae that girdle the stalk one to two inches above the soil line in September. Later planted fields will be more attractive for egg laying, so they will be more likely to be damaged. In parts of the state where only three generations occur, the overwintering second and third generation larvae do the same type of damage.

At this point, what can we do to control the larvae? Not much. Fields that were planted with full-season-control Bt hybrids should not see much damage. Insecticidal control at this point would not be a good decision, but identifying fields with the worst infestations and selecting them for the earliest reasonable harvest would be a good decision.

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Black Light Trap Catch Report
(Ron Blackwell)

County/Cooperator	7/18/00 - 7/24/00							7/25/00 - 7/31/00						
	VC	BCW	ECB	GC	CEW	FAW	AW	VC	BCW	ECB	GC	CEW	FAW	AW
Clinton/Blackwell	0	6	198	48	0	0	4	0	0	650	4	2	0	0
Dubois/SIPAC	0	0	5	26	0	0	0	0	0	4	16	3	0	0
Jennings/SEPAC	0	0	35	11	0	0	0	0	0	66	12	0	0	0
LaPorte/Pinney Ag Center	0	0	0	1	1	0	2							
Lawrence/Feldun Ag Center	0	0	27	4	0	2	1	0	0	18	5	0	2	0
Randolph/Davis Ag Center	0	0	22	10	0	0	0	0	0	52	28	0	0	0
Whitley/NEPAC	0	0	22	21	0	0	5	0	0	117	26	2	0	1

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

Plant Diseases

Corn Diseases – (*Gregory Shaner*) –

- Corn disease update

Common rust of corn seems to be slowing down. Pustules are still to be found in many fields, but their numbers have not increased greatly during the past couple of weeks. Hot weather may have slowed progress of the disease. Tissue surrounding older pustules has turned brown, causing a general necrosis that may resemble various leaf blotches or spots. Close examination of these spots will show the remnants of pustules (masses of spores) in the dead areas.

Grey leaf spot is present in some fields, but is confined to the lower leaves. At this stage, it seems unlikely that the disease will be a problem, except perhaps on very susceptible hybrids planted into last year's corn residue.

An accompanying article from the Kentucky Pest News discusses Diplodia ear rot. I have not had any reports, nor seen any ear rot in Indiana, but the disease may appear during the next 2 or 3 weeks. Like gray leaf spot, this disease is more likely to be a problem in fields where residue from last year's corn is present. As an aside, why is a disease caused by a fungus named *Stenocarpella maydis* called Diplodia ear rot? When the disease was first named, many years ago, the fungus was called *Diplodia maydis*. Plant pathologists have a regrettable tendency to name diseases for the pathogens that cause them. Then later, mycologists (people who study fungi), decide the original name for the pathogen is incorrect, for any of several rather technical reasons, and rename the fungus. So, plant pathologists must either continue to use an "incorrect", but familiar, disease name, or rename the disease. We tend to stick with the familiar.

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Soybean Sudden Death Syndrome – (*Gregory Shaner*) –

- No general outbreak of sudden death syndrome so far

Sudden death syndrome has been seen in a few fields, but is not widespread. There is still time for the disease to appear, so it is a good idea to scout fields. The disease is most likely to appear in fields that were planted early and that have received heavy rainfall in recent weeks. Scott Abney speculates that a period of about 10 days in July without rain in many parts of the state may have delayed symptom development.

Initial symptoms are an interveinal chlorosis (yellowing) on upper leaves that quickly progresses to necrosis (browning). Leaflets of diseased plants may fall off, leaving bare petioles (leaf stalks) attached to the stem. If the lower stem is split open, the cortex will be brown or gray, but the pith will be white. Foliar symptoms of brown stem rot are similar, but plants affected by this disease have a brown pith and normal cortex.

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Phytophthora Rot – (*Gregory Shaner*) -

- Mid season symptoms of Phytophthora rot are evident

Symptoms of Phytophthora rot are starting to appear in some soybean fields. Symptoms at this time range from dead plants to a mild wilting. Symptoms may be evident only on scattered, individual plants. The lower stem of a wilted or dying plant will be dark and perhaps have a moldy appearance. Roots of affected plants are dark, decayed, and have few nodules.

There is nothing that can be done at this stage about Phytophthora rot, but scouting to identify problem fields will permit more effective disease management in the future. *Phytophthora sojae* is a soilborne fungus, and will not move rapidly in the field. Fields, or areas within fields, that have a problem this year will likely have problems in future years. Wet areas are most prone to Phytophthora rot.

If a field was planted with a soybean variety that carries a specific gene for resistance (one of the *Rps* genes), and some plants show symptoms, this might indicate that a race is present that is not controlled by that *Rps* gene. When soybeans are next planted in such a field, a different source of resistance should be used. There are many different races of the fungus, and several races occur throughout Indiana soybean fields. No *Rps* gene is effective against all races of the pathogen, so it's important to use a source of resistance that is effective against the fungus that is present in a particular field.

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Soybean White Mold – (*Gregory Shaner*) –

- White mold is appearing

Scott Abney reports seeing initial stages of white mold in White County. The fungus *Sclerotinia sclerotiorum* causes White mold. The fungus survives as sclerotia. These are dark, elongated structures, 2 to 20

mm (1/16 to 3/4 inch) in diameter. Under cool, moist soil conditions, sclerotia germinate to produce small fruiting bodies called apothecia. Spores produced on the surface of apothecia that land on soybeans can infect and lead to white mold. The favored sites of infection are senescing flowers at lower nodes. The fungus grows through the flower stalk and invades the stem. This cuts off the supply of water and nutrients to the aboveground parts of the plant. Symptoms at this stage are evident as a wilting of the plants. A white fungal growth may be seen on lower stems of some plants.

White mold tends to be greater problem in narrow row soybeans, presumably because there is canopy closure by the time flowering starts. This creates a cooler and moister environment on the soil surface, which favors germination of sclerotia. It has traditionally been a problem in the northern half of Indiana.

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Certain Ear and Stalk Rots Showing Up – (*Paul Vincelli, Univ. of Kentucky, Kentucky Pest News, July 31, 2000*) -

Several late-season diseases are showing up in early planted corn. Diplodia ear rot (caused primarily by the fungus Stenocarpella maydis) was diagnosed last week in a field in the Green River Extension Area, and may be showing up in other locations throughout the state. In healthy corn, the husks dry from the tip downward, Ears infected by S. maydis often turn straw-colored at the base, or the entire husk may be prematurely dried. Strip away the husks and you'll see a white mold growing between the kernels, usually progressing from the base of the ear but soon consuming the entire ear. One may also see individual leaf blades dry prematurely from infections of the leaf sheath.

Since S. maydis survives in corn residue, risk factors for the disease include lack of rotation and conservation tillage practices. Certain hybrids appear to be highly susceptible, although information on hybrid susceptibility to this disease is usually not included in seed catalogs. Since some companies do not deliberately screen their hybrids against Diplodia ear rot, some seed suppliers rely on general field observations as a guide to hybrid susceptibility to this disease, which is a weak guideline at best. Nevertheless, avoid hybrids with a history of the disease in your area, and rotate away from corn in no- till fields where more than 2-3% of ears are showing the disease this season. For more information, see the UK Extension Publication, "Ear Rot of Corn Caused by Stenocarpella maydis" , PPA-43.

Stalk rot diseases were moderately severe in a field visited last week in the Pennyrile Extension Area in southwestern Kentucky. The principal disease found was charcoal rot, although some plants appeared to have Fusarium stalk rot. Look for prematurely dried plants whose lower stalk crushes easily when squeezed between thumb and forefinger. When cut open, the pith of stalks affected by charcoal rot will have a gray appearance, due to the presence of thousands of tiny round black survival bodies called "sclerotia". These are easily seen with a hand lens. Fusarium stalk rot usually produces no distinctive symptoms or signs in stalks. A tentative field diagnosis can be based on the presence of prematurely dried plants having soft lower stalks without evidence of other stalk rot diseases. Affected plants may exhibit a whitish moldy growth on the outside of affected stalk tissues.

According to weather maps from the UK Agricultural Weather Center, many of the southern-tier counties had received very little rainfall in the last six weeks until the rains of this past weekend. Drought during grain fill is a major predisposing factor for charcoal rot (which also can attack soybean), and Fusarium stalk rot is generally of greatest concern in warm, dry conditions. Fields that received rainfall this past weekend are at reduced risk from these stalk rots, but many of the plants in fields that experienced drought this summer are probably already infected. Thus, it would be wise to scout for stalk rots as these crops approach maturity. An easy way is to walk through the field and push stalks 8-10" from vertical at about chest height. Stalks with stalk rots or reduced stalk strength for other reasons will fall. If 10-15% of the field exhibits reduced stalk strength, consider early harvest for the field, so as to avoid losses due to lodging. More information can be found in the UK Extension publication, "Corn Stalk Rots".

Corn Yield Trends for Indiana 1930 - 2000 - (*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).

Indiana's corn crop yield has split even during the past ten years, with half of those years below trend and half above. What is in store for Indiana for 2000? If the 2000 crop simply matched the trend line, average corn grain yield would equal 136.4 bushels per acre. Only time will tell and I update this page as USDA publishes its monthly crop production estimates throughout the remainder of the year.

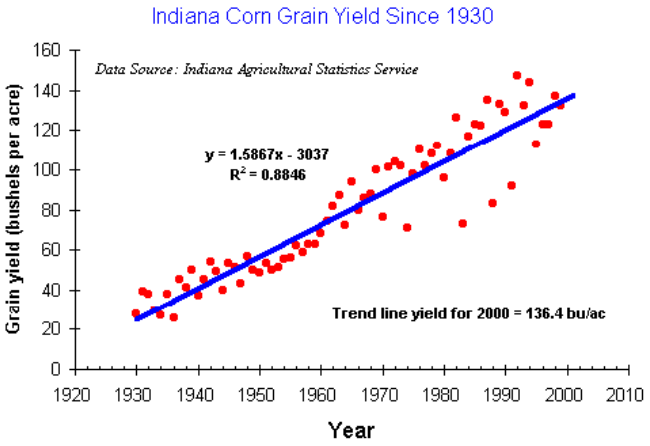


Figure 1.

While some point to the consistent 1.6 bu/ac/yr yield gain as a comforting signal that growers and researchers are continuing to be successful in their search for ever-increasing yields to feed the hungry world, others point out that the relative annual yield gain has been decreasing for years. Indeed, because the absolute annual yield gain has been relatively consistent, the relative annual yield gain for corn has been steadily decreasing (Fig. 2).

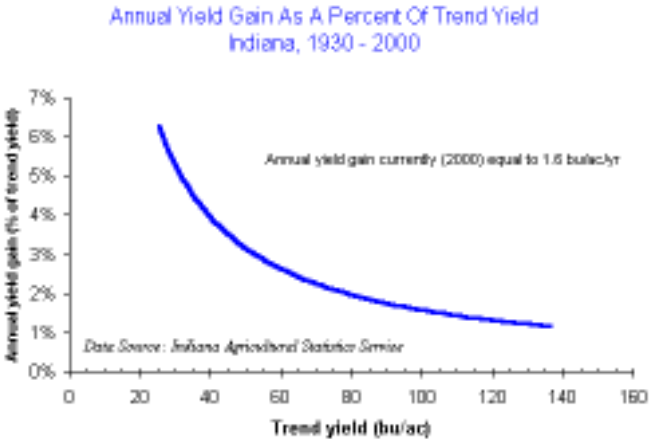


Figure 2.

Annual grain yield values fluctuate above and below the trend line throughout the nearly 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 25% less than the trend value. Severe droughts in 1983, 1988 and 1991 resulted in yields 33%, 29% and 25% 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 1.6 bu/ac/yr) and the estimated trend yield for 2000 changes from 136.4 to nearly 142 bushels per acre (Fig. 3). Such values may be more true estimates of statewide yield potential in "normal" years.

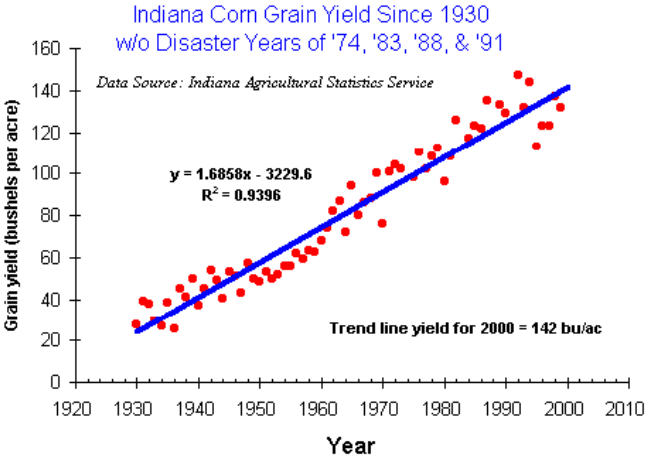


Figure 3.

The top five U.S. corn grain producing states are Iowa, Illinois, Nebraska, Minnesota and Indiana (Fig. 4). As of November 1999, these five states (6.194 million bushels) account for over 64 % of the total estimated grain yield for the U.S. in 1999 (9.537 million bushels).

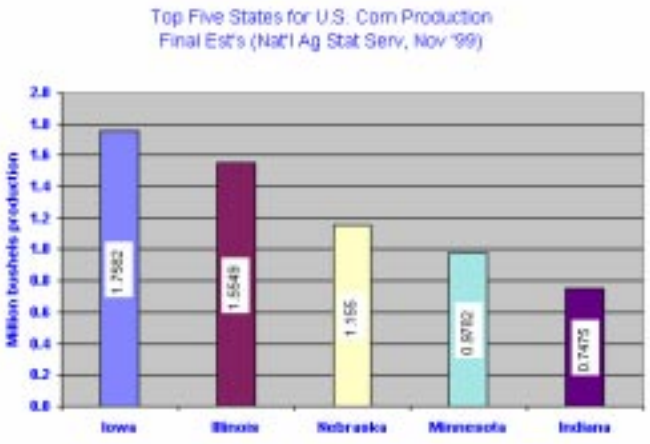


Figure 4.

Interestingly, the trophy for top statewide yields per acre does not belong to any of these Midwestern states. Bragging rights for highest U.S. corn yields per acre belong to states farther to the west (Fig. 5). A few reasons for this include 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.

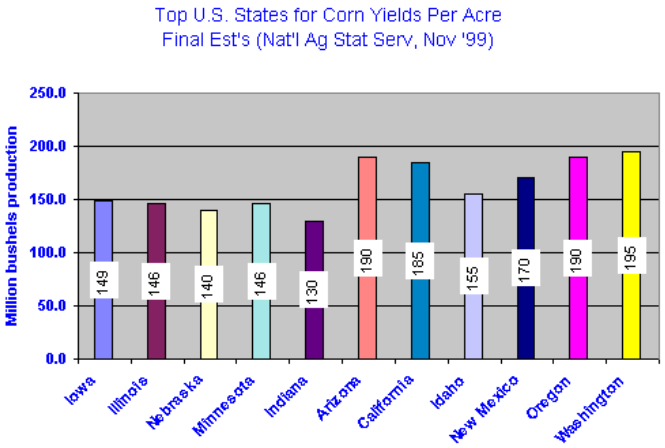


Figure 5.

For More Information...

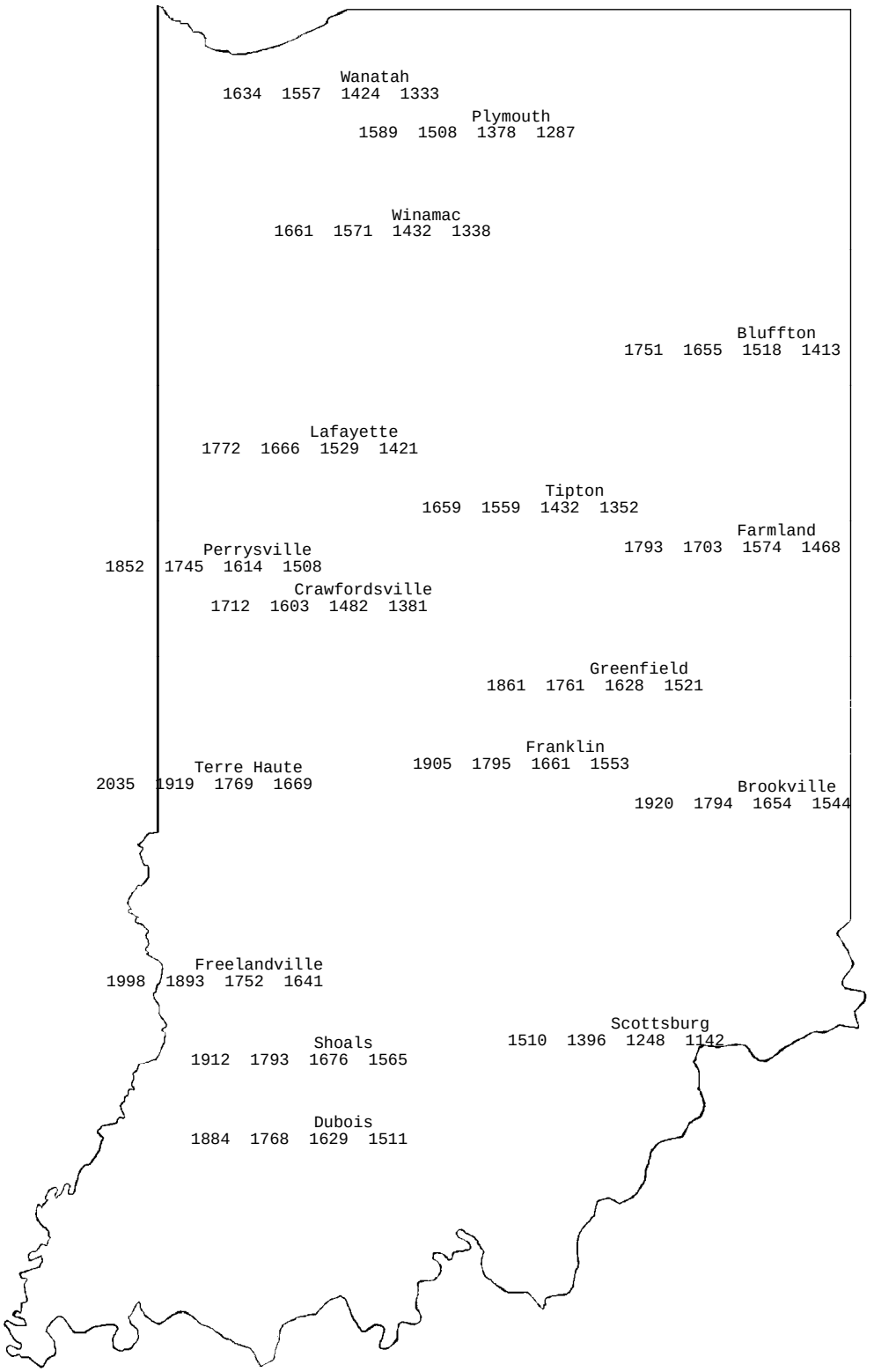
For more statistics about Indiana agricultural production, "surf" on over to the home page of the Indiana Agricultural Statistics Service at http://www.aes.purdue.edu/agstat/nass.html.

Weather Update

Temperature Accumulations from Jan. 1 to August 2, 2000

MAP KEY
Location GDD(4) GDD(10) GDD(60) GDD(90)

GDD(4) = Growing Degree Days from April 14 (4% of Indiana's corn planted), for corn growth and development
GDD(10) = Growing Degree Days from May 1 (10% of Indiana's corn planted), for corn growth and development
GDD(60) = Growing Degree Days from May 5 (60% of Indiana's corn planted), for corn growth and development
GDD(90) = Growing Degree Days from May 12 (90% of Indiana's corn planted), for corn growth and development



4" Bare Soil Temperatures 8/2/00

Location	Max.	Min.
Whitford Mills	75	71
Wanatah	87	70
Winamac	82	71
W Laf Agro	73	69
Tipton	78	68
Farmland	71	68
Perrysville	76	72
Crawfordsville	77	73
Liberty	80	67
Terre Haute	80	74
Oolitic	77	74
Dubois	90	70

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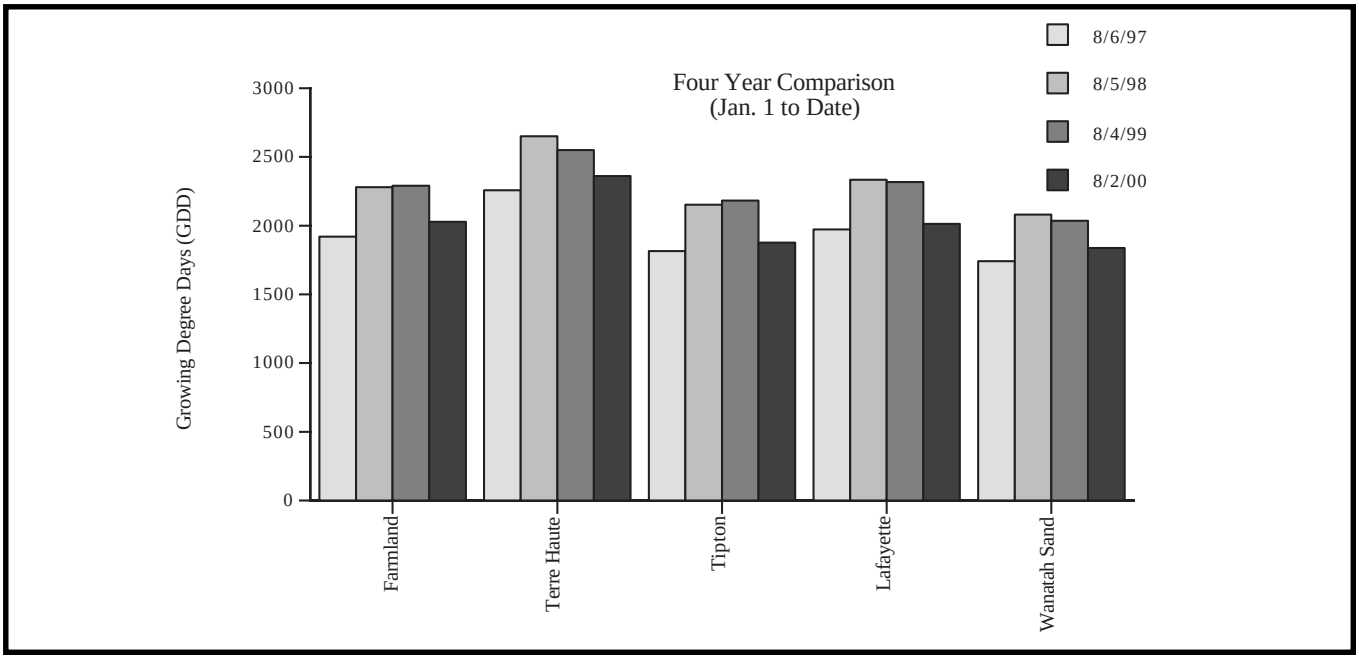

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