Pest & Crop

June 30, 2000 - No. 15

In This Issue

HAPPY 4TH OF JULY!

Insects, Mites, and Nematodes

Western Corn Rootworm Beetles Emerging - (*John Obermeyer, Larry Bledsoe, and Rich Edwards*) -

- Western corn rootworm beetles can now be seen
- Beetles should not be a concern until fields are pollinating
- Late planted fields could be a "trap crop" for beetles and egg laying

Traps in northwestern Indiana caught the first western corn rootwom adults on June 27. It is likely that these beetles have been emerging throughout southern Indiana for over a week. Generally the first beetles to emerge are males, female emergence begins a few days later. Once the females emerge, feed, and mate, they tend to disperse to other fields. If both western and northern species are present in a field, the western beetles emerge first.

After emerging, beetles will begin to feed on corn leaves if pollen is not available. This leaf feeding damage is usually of no economic

Rootworm beetle corn leaf feeding

importance. Growers should be made aware, however, that pollinating plants which have high beetle populations could suffer economic losses from the beetles clipping silks prior to the completion of pollination. Producers should closely watch their fields for this type of feeding activity when pollination begins.

Western corn rootworm
male (above) and female (below)

Producers should also remember that the latest planted fields in an area will be attractive to egg-laying beetles in late July when pollination is taking place in these fields. These fields should not only be closely watched for silk clipping, but the numbers of beetles present should be noted for determining the need for a soil insecticide the next year if going back to corn. More on this pest in future issues of the *Pest&Crop*.

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Japanese Beetle, Feeding in Field Crops and Grub Potential - (*John Obermeyer, Larry Bledsoe, and Rich Edwards*) -

- Annual grub feeding is over, now it's the beetle's turn
- Watch for activity on soybean, and later on corn silks
- Management information provided
- Discussion of controlling adults to prevent grub damage next year

Japanese beetle adults are emerging throughout most of Indiana. These adults developed from grubs feeding in lawns, other grassy areas, and agricultural crops. This year's infestation of adults is the result of eggs that were laid by female beetles last summer. After these eggs hatched in 1999, the grubs immediately began to feed on roots and decaying organic matter in the soil. They continued their feeding from late summer into the fall. Damage to field crops was not noted late last summer since root systems were quite extensive and well established by that time. The grubs overwintered deep in the soil and returned to near the soil surface to feed early this spring.

Spring root feeding by the grubs can result in serious damage to early planted crops, especially corn. This spring this was the case in some fields, especially in northern half of Indiana. Since this marks the beginning of a new cycle for this pest, pest managers should be monitoring for Japanese beetles on a regular basis. Over the next two months watch for two things: 1) adult feeding on this year's crop(s) and 2) grub potential for next year's crop.

Scott Gabbard, Shelby Co. CES

Japanese beetle corn leaf feeding

Japanese beetles will feed on more than 300 different species of plants, but are especially fond of roses, grapes, smartweed, soybeans, corn silks, flowers of all kinds, and overripe fruit. Beetle damage to cultivated crops is often minimal and defoliation (leaf removal) on soybean usually looks much worse than it is. The beetles often congregate in several areas of a soybean field, feeding on and mating in the upper canopy. This is often observed by producers from the cabs of their trucks. The beetles' iridescent, metallic color catches the attention of those doing "windshield" field inspections. Closer inspections will often reveal that weeds such as smartweed have made fields even more attractive to the beetles.

Although soybean can sustain economic damage from the feeding of the beetles, soybean has the amazing ability to withstand considerable damage (defoliation) before economic losses occur. The impact of defoliation is greatest during flowering and pod fill because of the importance of leaf area to photosynthesis, and ultimately to yield. Therefore, nearly 50% soybean defoliation before bloom or 15-25% defoliation from bloom to pod fill can be tolerated before yields are economically affected.

This average defoliation must occur for the whole plant, not just the upper canopy. In corn, Japanese beetle feeding on corn silks is usually minimal and spotty. Field inspections will often reveal that this feeding is not prevalent much beyond the field borders. If beetles are feeding on corn silks, an insecticide should be applied only if silks are being cut off to less than 1/2 inch **before** 50% pollination has taken place. Beetles are often attracted to dead or dying silks to feed, obviously beyond 50% pollination.

Japanese beetle soybean leaf feeding

Controlling beetles to prevent egg laying and therefore grubs in next year's crop, in theory sounds feasible, but has not been researched. The Japanese beetle can fly considerable distances to a field if something within the field attracts them. Thus, reinfestations can occur because the beetles are with us such a long period of time. As well, even though beetles are present in a field, it does not mean that the field will have an economic grub population next year. Soil type, overwintering success, as well as many other factors, will impact egg laying and grub establishment. Certain areas of the state have perennial problems with this insect and fields within these areas should be closely watched. Because Japanese beetle populations are usually clumped in fields, spot treatments may be an option for heavy infestations. This may reduce, but not eliminate, the grub feeding potential for next year. Grub history fields that have high beetle populations this year and will go to corn in 2001, may need a planting time insecticide placed in-furrow for grub control. However, this year, even full rates of labeled soil insecticides did not sufficiently control some grub populations. Delayed corn planting, early May rather than mid-April, should also be considered where economic grub infestations are expected.

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Potato Leafhopper Survey in Alfalfa June 27, 2000 (Ron Blackwell)

County	# PLH / Sweep	Stem Ht. (in.)
Tippecanoe	1.4	18.2
Tippecanoe	1.3	25.5
Warren	0.8	25.6
Warren	1.1	22.8
Warren	0.9	24.6
Warren	0.8	22.7

Black Light Trap Catch Report (Ron Blackwell)

County/Cooperator	6/13/00 - 6/19/00							6/20/00 - 6/26/00						
	VC	BCW	ECB	GC	CEW	FAW	AW	VC	BCW	ECB	GC	CEW	FAW	AW
Clinton/Blackwell	0	0	0	0	0	0	4	0	3	1	0	0	0	5
Dubois/SIPAC	2	1	0	0	0	0	17	6	0	0	0	0	0	71
Jennings/SEPAC	0	0	0	0	0	0	2	0	0	0	1	0	0	5
LaPorte/Pinney Ag Center	4	2	1	0	0	0	14	1	0	7	0	0	0	10
Lawrence/Feldun Ag Center	0	1	2	0	0	0	18	7	0	0	0	0	0	44
Randolph/Davis Ag Center	1	0	1	0	0	0	11	2	2	0	2	0	0	8
Tippecanoe/P.J. Boeve			0											
Whitley/NEPAC	5	4	92	0	0	0	186	2	4	27	0	0	0	108

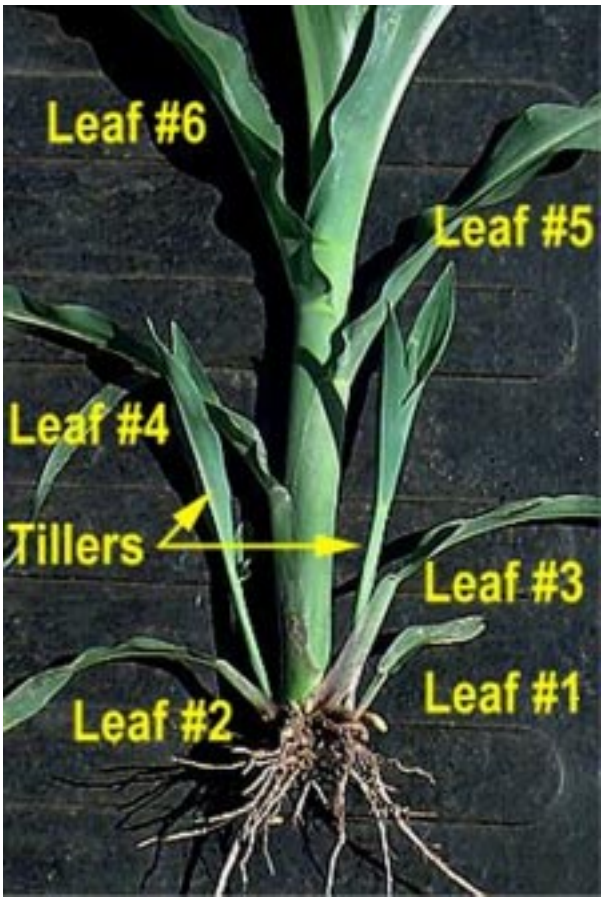
BCW = Black Cutworm ECB = European Corn Borer GC = Green Cloverworm CEW = Corn Earworm
AW = Armyworm FAW = Fall Armyworm VC = Variegated Cutworm

Agronomy Tips

Some Call 'em Suckers, Some Call 'em Tillers: Good or Bad for Corn? - Bob Nielsen -

- Tillers in corn generally signal favorable growing conditions.
- Tillers are not detrimental to main stalk.

Some of the guys over at the B&B Pitstop Cafe were arguing the other day about 'suckers' in corn. The older fellows remember being sent to the fields as kids to pull 'suckers' off the corn plants because their fathers said 'suckers' were bad for the corn, although some suspected that the real purpose may have been to simply keep them out of their father's hair on hot, muggy summer days. Well, what are 'suckers' and are they bad for corn?



'Suckers' Are 'Tillers.' 'Suckers' in corn are more properly termed 'tillers' and are auxiliary corn plants that develop from one or more stalk nodes (joints) at the base of the main stalk, one tiller per node. Tillers become nearly independent plants as they develop, partly due to the fact that they will eventually develop their own root system. Tillers may compete somewhat with the main stalks, but given their late developmental start they usually lose out in the competition for water, nutrients, and light.

Tillering In Response to Damage. One or more tillers commonly form if the main stalk is injured or killed by hail, frost, insects, wind, tractor tires, little kids' feet, deer hooves, etc. If the damage occurs early enough in the growing season, such tiller development may result in harvestable ears. Late tillering, however, usually doesn't allow enough time for tiller ears to develop and mature before a killing fall frost. An example of late tillering occurred in some Indiana fields damaged by the late June frost of 1992. The apparent 'regrowth' of these fields looked promising from windshield surveys, but little if any grain yield was obtained from these damaged fields.

Tillers on Normal Plants. Tillers may develop in undamaged fields, also. Most agronomists agree that such tiller development is a signal that growing conditions are very favorable, with few limitations on available nutrients, water, or light. Favorable growing conditions may exist simply due to favorable weather conditions or because the plant population is too low for the productivity level of the field. With favorable growing conditions, the corn plant has ample energy and nutri-

ents to 'invest' in tiller development. Some hybrids are also genetically prone to developing tillers, even at adapted plant populations.

Bottom Line. As a rule, the end result of tiller development in an undamaged field is neutral. Usually, the main stalk will outcompete the tillers and the tillers eventually wither away. Tiller development in a field that was damaged or simply planted too thin MAY result in harvestable ears and thus contribute to grain yield.

On-Line References:

- Does Tillering Affect Hybrid Performance? (Ohio State Univ.) <http://www.ag.ohio-state.edu/~ohioline/agf-fact/0121.html>

- Tillers or Suckers (Call Them What You Will) - They Aren't Very Pretty (NK Wired - Novartis) <http://www.nk.com/nkwired/199907_20_tillers.html>

Don't forget, this and other timely information about corn can be viewed at the Chat 'n Chew Café on the World Wide Web at <http://www.kingcorn.org/chatchew.htm>. For other information about corn, take a look at the Corn Growers' Guidebook on the World Wide Web at <http://www.kingcorn.org/>

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Bits & Pieces

Report: Herbicide Could Cause Cancer – (USA Today, Traci Watson, June 28, 2000) -

Atrazine, described in this story as the most commonly used herbicide in the USA, has been upgraded from a "possible" to a "likely" carcinogen in a draft report prepared by scientists at the Environmental Protection Agency. The report says there are indications that atrazine - the weed killer of choice for farmers growing corn, sorghum, citrus fruits and other crops - could cause uterine, prostate and breast cancer in humans and may also disrupt reproductive development.

The story says that atrazine seeps easily into streams and groundwater and from there gets into drinking water, the main pathway for human exposure. The EPA hasn't finished its review of how Americans are exposed to atrazine, but "it is clear that seasonal drinking water contamination could be widespread," the EPA's Steven Galson was cited as saying. A 1999 report by the Environmental Working Group , an environmental organization, said that atrazine taints the drinking water supply for more than 10 million Midwesterners and that treatments rarely remove all traces of the chemical.

Scientists from Novartis, the chemical's biggest manufacturer, were cited as vigorously disputing the report and said the studies that the EPA relied on apply only to rats. Effective and relatively inexpensive, atrazine is spread in fields and orchards across the nation, especially during the spring weed season. No one disputes that atrazine causes mammary tumors in a certain strain of rat. Nor does anyone dispute that atrazine does its dirty work in the rat by attaching to sites on the hypothalamus, a part of the brain involved in regulating levels of sex hormones. However, the two sides part company when it comes to extrapolating rat data to humans. The strain of rat that was tested "is uniquely sensitive to atrazine," says Novartis scientist Timothy Pastor. The EPA, however, says humans are also likely to suffer from atrazine-related cancer because the herbicide affects hormone levels, and many human cancers are sensitive to hormone levels. Novartis also says that it has done extensive tests on rodents exposed to atrazine in utero and found no abnormalities. The EPA, however, says that the reproductive systems of rodents dosed with atrazine develop abnormally. This could translate in women to delayed puberty and in men to prostate inflammation, though there's no direct evidence for these effects.

Lodged Corn Plants, Must Be Rootworms! - (*John Obermeyer, Larry Bledsoe, and Rich Edwards*) –

- The time of corn lodging is upon us
- Many factors influence root development and damage
- Correlating root damage to yield reduction is difficult
- Lodged plants and subsequent "goosenecking" does reduce yield

Lodging of corn plants in spots of the field is typical this time of year. There seems to be a direct timing relationship of corn's rapid vegetative growth spurt before tasseling and Indiana's severe thunderstorms coupled with high winds. It is inevitable that concerned producers will phone following such a scenario wanting exact causes for their lodged corn plants. Inspections now will provide more information rather than waiting until harvest ("post-mortem").

Bob Nielsen, extension agronomist, has compiled a list of possible factors (with slight revision) to the possible wimpy corn roots and lodged plants we may soon be seeing:

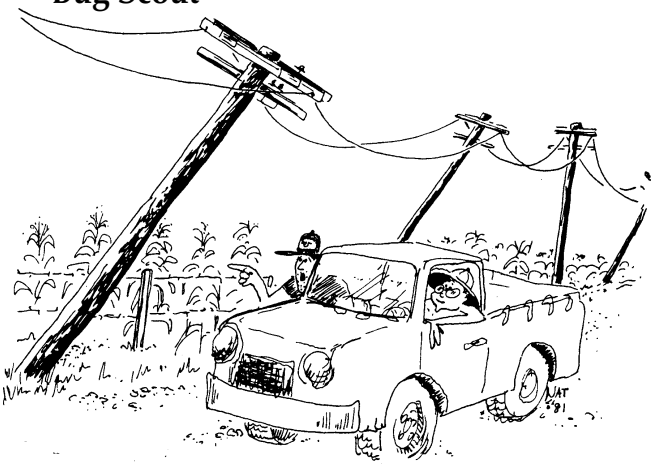
- Cold soil temperatures, especially in no-till systems with heavy surface residues
- Lengthy periods of saturated soils from frequent rainfall after planting
- Sidewall compaction from planting into wet soils
- Soil compaction from last fall's harvest on wet soils
- Soil compaction from last winter's tillage of wet soils
- Soil compaction from this spring's tillage of wet soils
- Shallow planting in soils that subsequently dried out
- Carryover soybean herbicides
- Corn herbicide injury
- Anhydrous ammonia injury from planting too soon after application
- Starter fertilizer injury, sometimes from inaccurate fertilizer placement
- Seedling blight
- Insect injury below ground, especially grubs and rootworms
- Lack of available soil nitrogen due to denitrification of wet soils
- Water logged soils coupled with high winds

Bob says, "The existence of one or more of the first six factors often compounds the effects of the remaining factors, causing greater lodging than when a single factor occurs alone. The effects of many of these factors are also influenced by interactions with weather events, human activity, and natural soil variability within fields. Those influenced primarily by human activity can result in distinct patterns in a field (e.g., tire-track compaction, tile drainage). Interactions with weather events and soil variability often result in undistinguishable patterns of uneven lodging."

Rootworms receive the immediate blame for lodged plants because of their presence and damage. However, closer inspection of roots not damaged by rootworms revealed poor development from other factors. Correlating yield loss to root damage at this time is a real guessing game. It has been shown that varying degrees of current root damage (rootworms, compaction, fertilizer burn, etc.) does not proportionally effect yield. Corn has an amazing ability to regrow roots (varieties differ in root proliferation) and yield normally, especially when moisture is not a limiting factor. The key ingredient to yield with root damaged plants is whether the corn stands up. Research conducted by Tom Turpin and Marlin Bergman in the early 1980's showed a 15-52% (31% avg.) reduction in yield for lodged plants at this time of year.

In sum, 1) lodging increases dramatically after heavy rains and winds, 2) many factors cause poor root systems, 3) root damage does not always correlate to yield loss, 4) yield is likely to be significantly affected if the plants lodge just before or at pollination.

Bug Scout



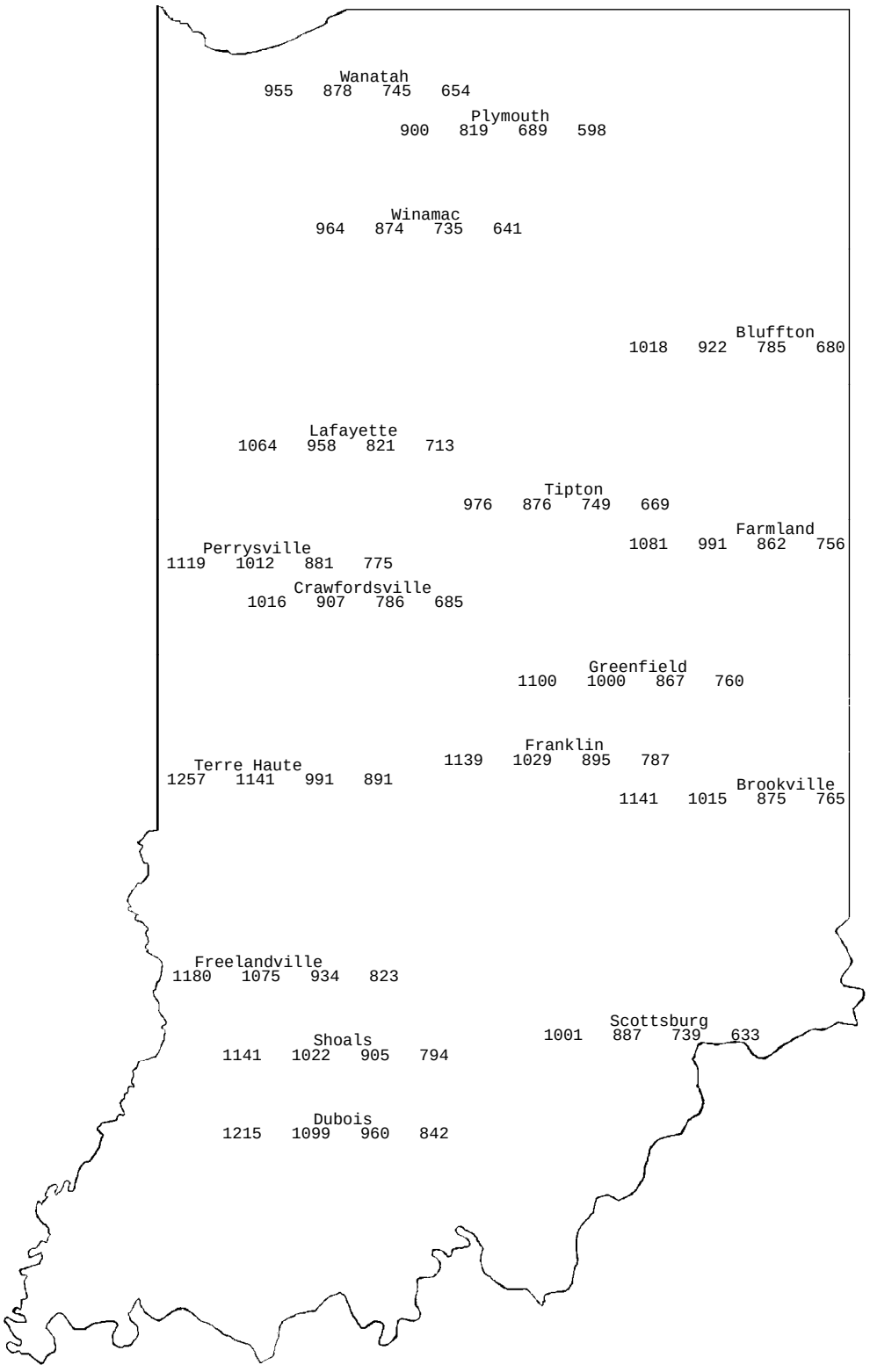
"I bet you a dime that lodging is not caused by rootworm."
Reprinted with permission from *Prairie Farmer* magazine.

Weather Update

Temperature Accumulations from Jan. 1 to June 28, 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 6/28/00

Location	Max.	Min.
Wftd. Mills	72	69
Wanatah	81	66
Columbia City	75	62
Winamac	80	67
Kentland	77	67
Bluffton	69	68
W Laf Agro	73	65
Tipton	78	64
Farmland	74	63
Perrysville	74	71
Crawfordsville	73	70
Liberty	79	67
Trafalgar	78	70
Terre Haute	78	73
Oolitic	79	73
Dubois	87	67

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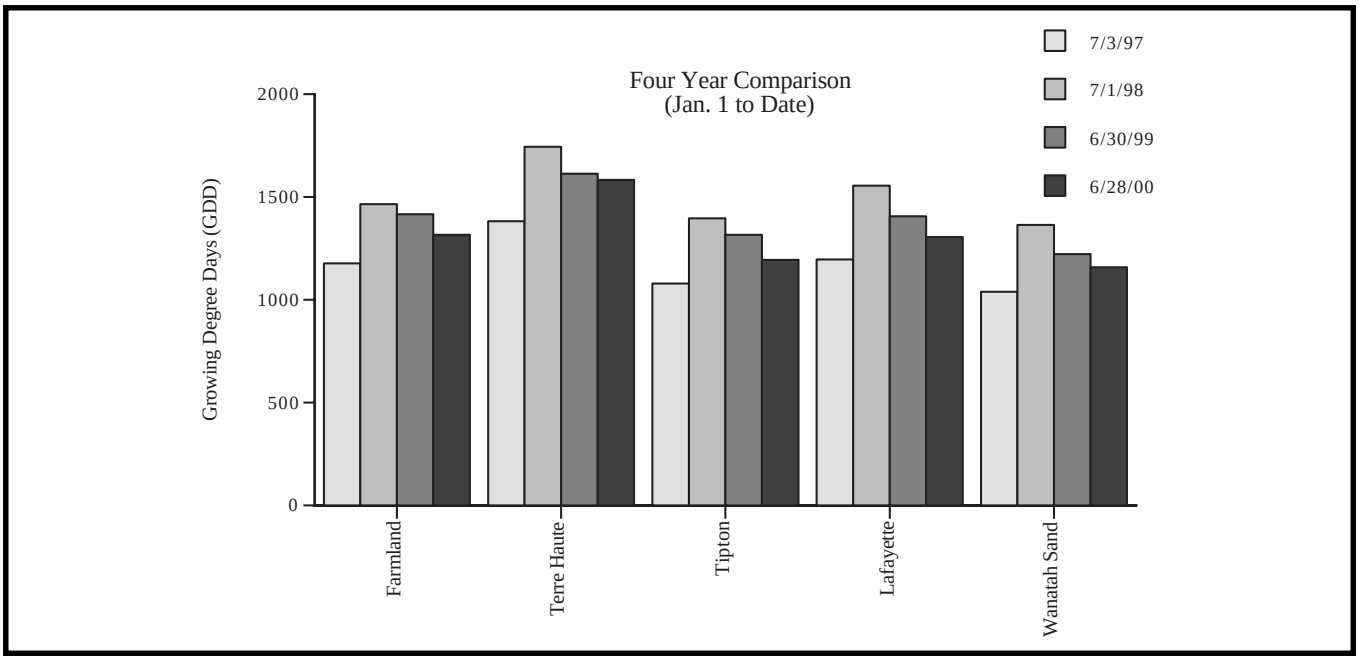

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