Pest & Crop

August 9, 2002 - No. 21

In This Issue

Insects, Mites, and Nematodes

Spider Mite Damage Appearing in Some Soybean Fields - *(John Obermeyer, Rich Edwards, and Larry Bledsoe)*

- Droughty soybeans are a nutritious drink for spider mites
- Scout beyond the damaged area to determine spider mite colonization
- Spot treatments may still be possible
- Large amounts of water and high nozzle pressure increases treatment success

Spider mite activity is obvious in some stressed soybean fields. Spider mites are migrating from field edges, as they dry, into the soybeans. While soybeans are under moisture stress their plant juices actually becomes a "protein broth" that benefits spider mites growth and development. Populations can explode in just days!

Along field edges of moisture stressed fields look for discolored, yellowing and bronzing, soybeans. Shake discolored plants over a white piece of paper and watch for small dark specks (1/60 inch in length) moving about. Once spider mites have been positively identified in the damaged area(s) of the field, it is essential that the whole field be scouted to determine the range of the infestation. Sample at least 5 different areas of the field and determine whether the spider mites are present or not by using the "shake" method.

Spot treatments may be effective if infestations are caught early enough and the mites have not yet moved across the field. Success of spot treatments depends on spraying beyond the infested area, not just the damaged area. Spray a buffer zone of at least 200 feet beyond spider mite colonized plants. If scouting results indicate that movement has occurred within several areas of a field or throughout a field, then treating the whole field should be considered. Residual activity of insecticides (dimethoate or Lorsban) will last at most 10-14 days, new soybean growth will not be protected. We recommend nozzle pressures of 40 psi and no less that 20 gallons of water per acre for ground equipment. Normally aerial applications are not as efficacious, treatments with less that 3 gallons of finished spray per acre should not be attempted.

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Stinging Caterpillars - *(John Obermeyer, Rich Edwards, and Larry Bledsoe)* -

- Two caterpillar species now feeding on field crops can inflict painful stings
- Other caterpillars, such as woollybears and thistle caterpillars, are harmless

Though crops aren't exactly inviting this time of year for making observations, "dyed in the wool" pest managers continue to monitor for insect and weed pests. Occasionally at this time of year, peculiar looking caterpillars can be found feeding on the leaves of corn and soybean. Look carefully before you touch! Two species, the Io moth and the saddleback caterpillar, found in fields can sting when handled! Though both species can be found on many different plants, in field crops the Io feeds on both corn and soybean, while the saddleback is only encountered in corn.

The bodies of these caterpillars are covered with "stinging" or "nettling" hairs, which produce a stinging sensation and temporary rash when the caterpillars come into contact with the skin. These stinging hairs resemble spines; whereas the often encountered and harmless woollybear is just hairy looking. To add confusion to the matter, there are many more formidable looking caterpillars found on various plant species that are harmless. The old adage "when in doubt, leave it alone" applies here. Color pictures of Io and saddleback caterpillars are available on the Field Crops Pest Management web site at: <http://icdweb.cc.purdue.edu/~mzello/index.html>. Happy Scouting!

IO caterpillar in corn (stings)

Saddleback caterpillar in corn (stings)

Thistle caterpillar (harmless)

Woollybear caterpillar (harmless)

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Where are the Corn Borer Moths? - (*John Obermeyer*) -

Black light trap counts and evening windshield observations have revealed that the second generation corn borer moth flight is low. Don't count this pest out completely, as there may be some "hot spots" in Indiana. Fields that will be most susceptible to attack are those that are actively pollinating. Consider that replanted areas of fields, that are delayed in development, may be a "trap" crop for these second generation moths.

European corn borer moth - male

European corn borer moth - female

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Black Light Trap Catch Report
(Ron Blackwell)

County/Cooperator	7/23/02 - 7/29/02							7/30/02 - 8/5/02						
	VC	BCW	ECB	SWCB	CEW	FAW	AW	VC	BCW	ECB	SWCB	CEW	FAW	AW
Clinton/Blackwell	0	0	56	0	0	0	11	0	0	92	0	0	0	0
Dubois/SIPAC	0	1	0	0	1	0	1	0	3	0	0	2	0	5
Jennings/SEPAC	0	0	3	0	0	0	0	0	0	0	0	0	0	0
Knox/SWPAC	1	0	16	3	0	0	2	4	1	7	0	0	0	7
LaPorte/Pinney Ag Center	1	7	2	0	0	0	2	0	0	37	0	0	0	1
Lawrence/Feldun Ag Center	0	1	0	0	0	0	3	0	2	0	0	0	0	1
Randolph/Davis Ag Center	2	2	15	0	0	0	11	0	0	25	0	0	0	5
Vermillion/Hutson	0	0	0	0	0	0	0	0	0	10	0	0	0	0
Whitley/NEPAC	0	2	5	0	0	0	25	0	2	25	0	0	0	7

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

Agronomy Tips

Yield Loss During Grain Fill - (*Bob Nielsen*) -

Yield potential in corn is influenced at several stages of growth and development. Ear size potential (number of potential kernels) is determined quite early, from about knee-high to about shoulder-high, or from about leaf stage V6 to V15. The next influential period for the corn crop is pollination.

The period following successful pollination and finishing at kernel black layer is defined as the grain filling period in corn and represents the final important yield determining time frame. Grain fill stages in corn were described in a recent article (**Grain Fill Stages in Corn**, *P&C Newsletter*, 8/2/02). Perfect conditions for ear size determination and pollinations can still be negated if severe stress occurs during the grain fill period.

Yield loss during grain fill can occur from 1) stand loss, 2) incomplete kernel set, 3) lightweight kernels, and 4) premature plant death.

Stand Loss During Grain Fill

Yield loss due to stand loss during grain fill is usually greater than that due to stand loss that occurs during the vegetative phase. When stand loss occurs prior to pollination, ear size (number of kernels) on surviving plants may compensate in response to the lesser competition of a thinner stand. Additional compensation may occur during grain fill in terms of greater kernel weight. When stand loss occurs during grain fill, ear size has already been set. Only kernel weight can compensate in response to the lesser competition of a thinner stand.

Incomplete Kernel Set in Corn

Kernel set refers to the degree to which kernels have developed up and down the cob. Incomplete kernel set is not always apparent from 'windshield' surveys of a corn field. Husks and cob will continue to lengthen even if kernel set is incomplete. A wonderfully long, robust-looking, healthy green ear shoot can completely mask even a 100 percent failure of pollination or severe kernel abortion.

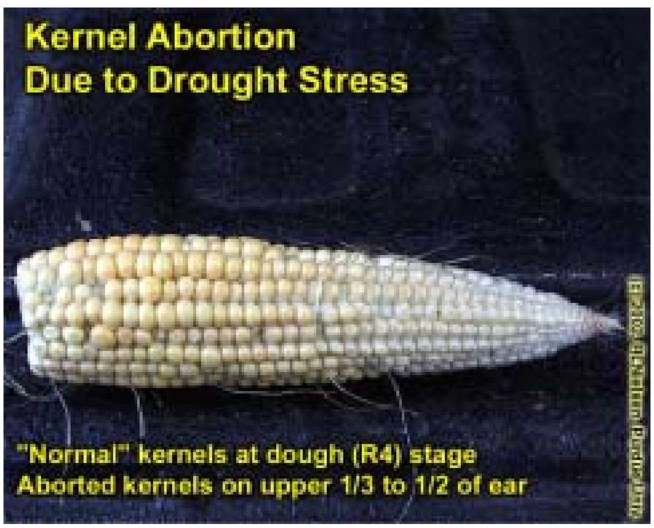
One of the causes of incomplete kernel set is **unsuccessful pollination**. Unsuccessful pollination results in ovules that are never fertilized and, subsequently, ears with varying degrees and patterns of incomplete kernel set. Many factors can cause incomplete pollination and distinguishing between them can be very difficult.

Certain insects like corn rootworm beetles and Japanese beetles can interfere with pollination and fertilization by their silk clipping action. These insects feed on pollen and subsequently clip silks as they feed on the pollen that has been captured by the silks. Unusually early or late pollinating fields are often particularly attractive to these insects.

Drought stress may delay silk emergence until pollen shed is nearly or completely finished. During periods of high temperatures, low relative humidities, and inadequate soil moisture levels, exposed silks may also dessicate and become non-receptive to pollen germination.

Unusually favorable conditions prior to pollination that favor ear size determination can result in ears with an unusually high number of potential kernels per row. Remember that silk elongation begins near the butt of the ear and progresses up toward the tip. The tip silks are typically the last to emerge from the husk leaves. If ears are unusually long (many kernels per row), the final silks from the tip of the ear may emerge after all the pollen has been shed.

Another cause of incomplete kernel set is **abortion of fertilized ovules**. Aborted kernels are distinguished from unfertilized ovules in that aborted kernels had



actually begun development. Aborted kernels will be shrunken, mostly white, often with the yellow embryo visible; compared to normal plump yellow kernels.

Kernels are most susceptible to abortion during the first 2 weeks following pollination, particularly kernels near the tip of the ear. Tip kernels are generally last to be fertilized, less vigorous than the rest, and are most susceptible to abortion. Once kernels have reached the dough stage of development, further yield losses will occur mainly from reductions in kernel dry weight accumulation.

Severe drought stress that continues into the early stages of kernel development (blister and milk stages) can easily abort developing kernels. Severe nutrient deficiencies (especially nitrogen) can also abort kernels if enough of the photosynthetic 'factory' is damaged. Extensive loss of green leaf tissue by certain leaf diseases, such as common rust or gray leaf spot, by the time pollination occurs may limit photosynthate production enough to cause kernel abortion. Consecutive days of heavily overcast, cloudy conditions may also reduce photosynthesis enough to cause abortion in recently fertilized ovules.

Decreased Kernel Weight

Severe stress during dough and dent stages of grain fill decreases grain yield primarily due to decreased kernel weights and is often caused by premature black layer formation in the kernels. Decreased kernel weight can result from severe drought and heat stress during grain fill; extensive European corn borer tunneling (especially in the ear shanks); loss of photosynthetic leaf area by hail, insects, or disease early in grain fill; and killing fall frosts prior to normal black layer development.

Once grain has reached physiological maturity, stress will have no further physiological effect on final yield, because final yield is already achieved. Stalk and ear rots, however, can continue to develop after corn has reached physiological maturity and indirectly reduce grain yield.

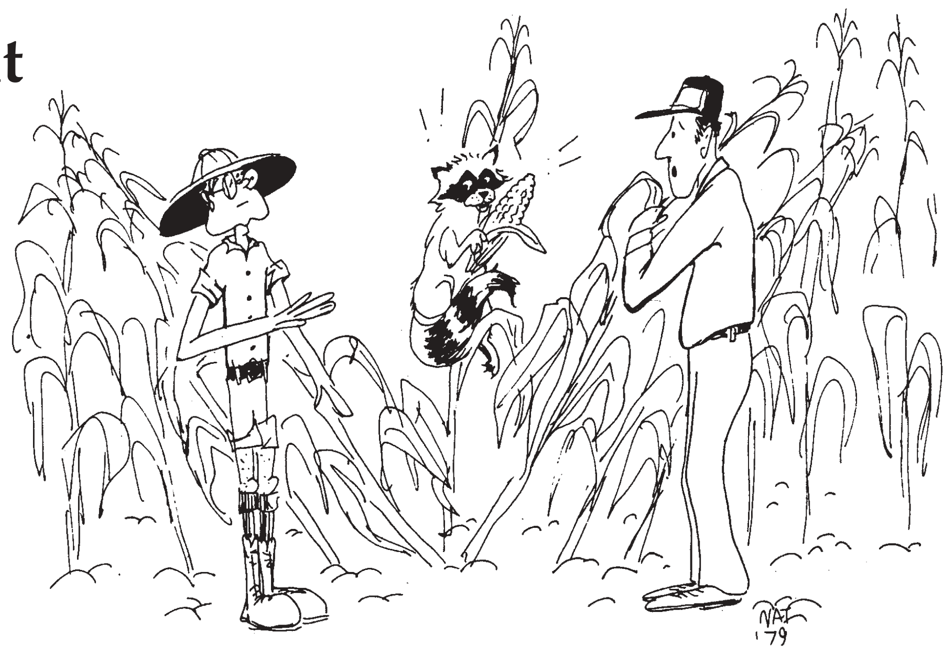
Premature Plant Death

A killing fall frost prior to physiological maturity can cause premature leaf death or whole plant death. Premature death of leaves results in yield losses because the photosynthetic 'factory' output is greatly reduced. The plant may remobilize stored carbohydrates from the leaves or stalk tissue to the developing ears, but yield potential will still be lost.

Premature death of whole plants results in greater yield losses than if only leaves are killed. Death of all plant tissue prevents any further remobilization of stored carbohydrates to the developing ear. Whole plant death that occurs before normal black layer formation will cause *premature* black layer development, resulting in incomplete grain fill and lightweight, chaffy grain. Grain moisture will be greater than 35%, requiring substantial field drydown before harvest.

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/cafe>. For other information about corn, take a look at the Corn Growers' Guidebook on the World Wide Web at <http://www.kingcorn.org/ >.

Bug Scout



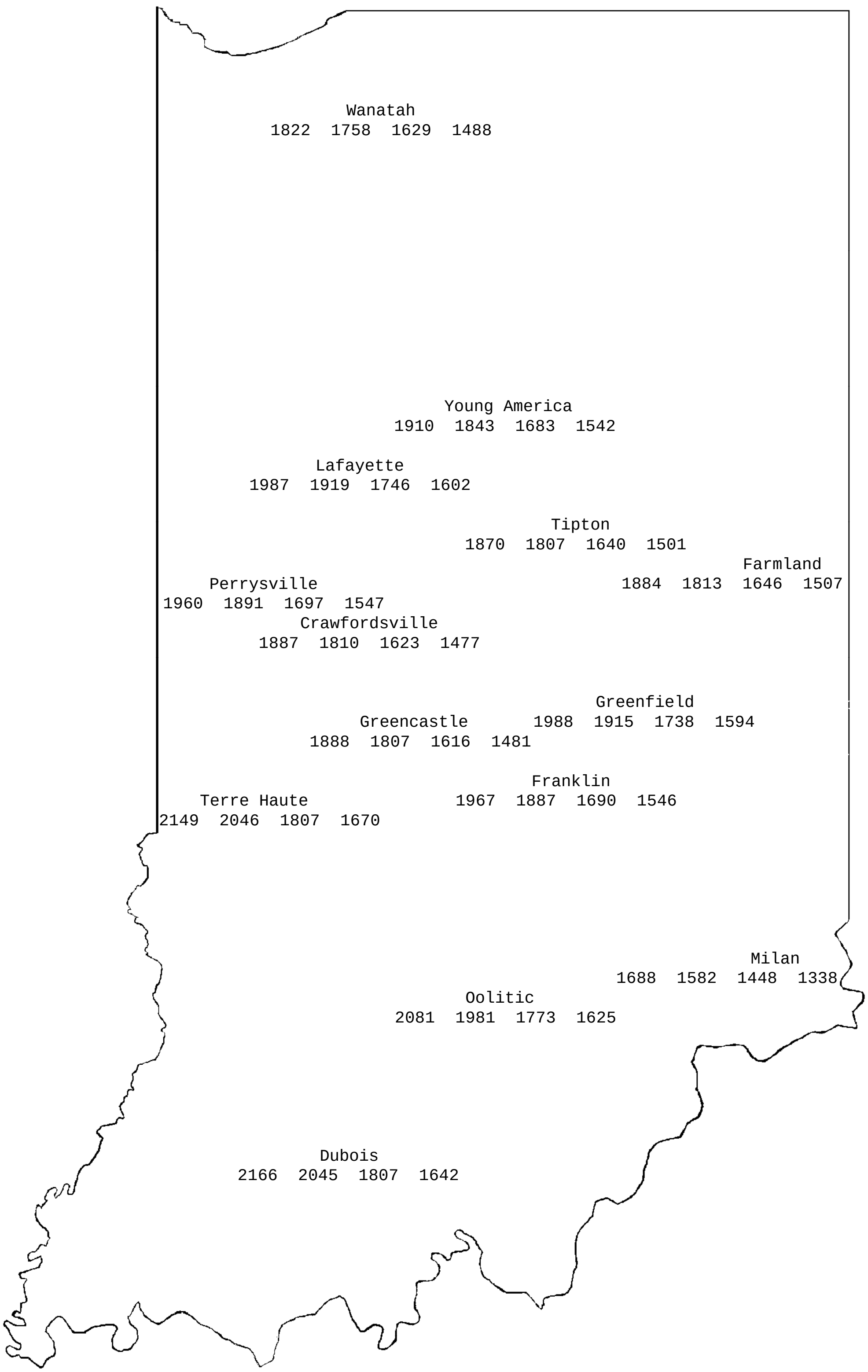
"I think I found the reason for the poor ear fill!"

Weather Update

MAP KEY			
Location			
GDD(2)	GDD(10)	GDD(43)	GDD (75)

Temperature Accumulations from Jan. 1 to August 7, 2002

GDD(2) = Growing Degree Days from April 21 (2% of Indiana's corn planted), for corn growth and development
GDD(10) = Growing Degree Days from May 5 (10% of Indiana's corn planted), for corn growth and development
GDD(43) = Growing Degree Days from May 26 (43% of Indiana's corn planted), for corn growth and development
GDD(75) = Growing Degree Days from June 2 (75% of Indiana's corn planted), for corn growth and development



4" Bare Soil Temperatures 8/7/02

Location	Max.	Min.
Wanatah	89	71
Columbia City	88	68
Winamac	88	69
W Laf Agro	87	72
Tipton	86	75
Crawfordsville	86	74
Terre Haute	87	71
Oolitic	85	75
Dubois	92	67

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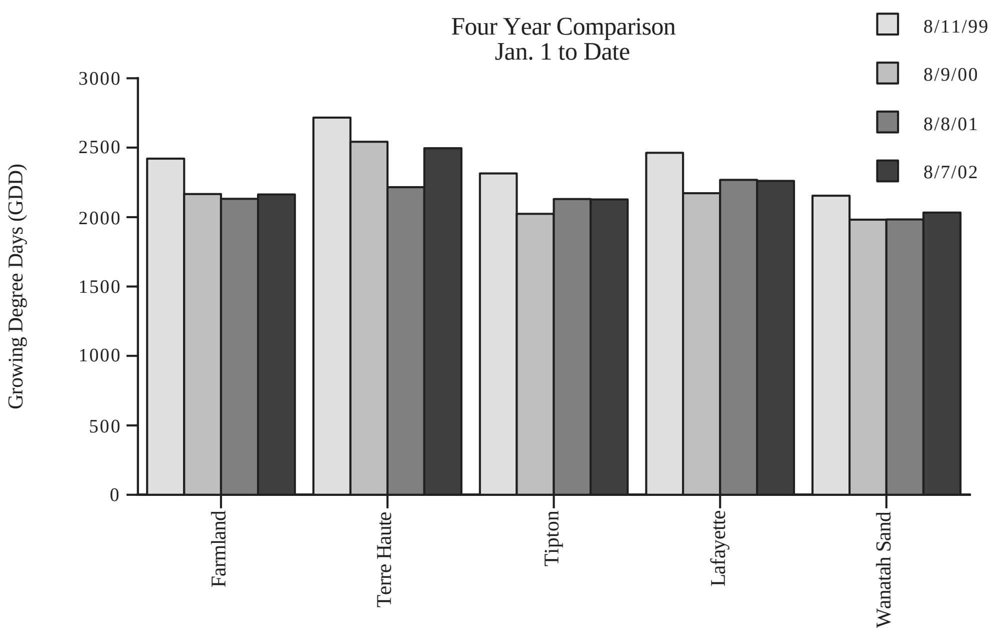
http://www.entm.purdue.edu/Entomology/ext/targets/newslett.htm



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