Pest & Crop

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In This Issue

Insects, Mites, and Nematodes

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

- Western corn rootworm beetles can now be seen
- Beetles should not be a concern until fields are pollinating
- Isolated pollinating fields could be a "trap crop" for beetles

A male western corn rootworm beetle was seen at the Diagnostic Training Center, Tippecanoe County, on June 28. 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 may disperse to other fields.

Western corn rootworm beetles feeding on corn leaf

After emerging, beetles will begin to feed on corn leaves if pollen is not available. This leaf feeding damage is usually of no economic importance. This year's staggered planting extremes will cause some fields to pollinate much sooner than others. These fields will act as "magnets" and economic losses may occur from silk clipping by the beetles prior to the completion of pollination. Producers should closely watch their fields for this type of feeding activity when pollination begins. If beetles are present and feeding on corn silks, an insecticide should be applied only if on average the silks are being cut off to less than 1/2 inch before 50% pollination has taken place. Note, this threshold is NOT based on beetles per plant.

Pest managers should also remember that the latest planted fields in an area will be attractive to egg-laying beetles in late July when these fields are pollinating. 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.

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Stunting and Lodging of Late-Planted Corn - (*John Obermeyer, Rich Edwards, and Larry Bledsoe*) –

- "Tall corn – short corn" may be from rootworm damage
- Rootworms feed on the developing nodal roots at the plant's crown
- Too late for rescue treatments

Reports and samples of corn that is either stunted and/or lodging continue to be received. Most of these fields were first-year corn (following soybean) and planted late May to early June. Central Indiana seems to be the area hardest hit by this rootworm damage. For some reason, producers decided not to use a soil insecticide at planting, even though they were in a "high-risk" area as determined by surveys in last year's soybean fields (see *Pest&Crop* #1, 2002).

Rootworm development is too far advanced at this time to attempt rescue treatments with insecticides. If possible, cultivation may help root regeneration by throwing soil up at the base of damaged plants. The best defense you have against rootworm is scouting soybean fields for beetles this August and determining the potential for egg laying and subsequent damage to next year's corn. This suggestion is for all of Indiana. Further information with many color pictures can be found in extension publication E-218, *Monitoring and Decision Rules for Western Corn Rootworm Beetles in Soybean* (*New 5/2001*). A hard copy of this publication can be obtained by calling 1888-EXT-INFO or an electronic copy viewed at <http://www.entm.purdue.edu/entomology/ext/targets/e-series/e-list.htm>.

"Short corn - Tall corn" from rootworm damage

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Japanese Beetle, Use Treatment Thresholds - (*John Obermeyer, Rich Edwards, and Larry Bledsoe*) -

- Beetle damage usually looks worse than it is
- Corn and soybean damage particulars and treatment guidelines are given
- Controlling adults to prevent grub damage is impractical
- Don't use "bag-a-bug" type traps

As previously reported, Japanese beetle are emerging and being seen throughout the state. Adults will continue to emerge from the soil for several weeks, causing concern to producers and homeowners alike. The one important thing to remember when it comes to Japanese beetles – their presence and damage usually looks worse than it is.

Field Corn: Japanese beetles feed on corn leaves, tassels, and silks. Generally ignore leaf and tassel damage since it is usually not economic. If beetles are present and feeding on corn silks, an insecticide should be applied only if on average the silks are being cut off to less than 1/2 inch before 50% pollination has taken place. This rarely happens on a field-wide basis. Don't be overly excited by this pest's tendency to clump (or party!) on a few ears within an area and eat the silks down to the husks. With sufficient soil moisture, silks will grow from 1/2 to 1 inch per day during the one to two weeks of pollen shed. Silks only need to be peeking out of the husk to receive pollen. Besides, beetles are often attracted to silks that have already completed the fertilization process even though they are still somewhat yellow. Check for pollen shed and silk feeding in several areas of the field, Japanese beetles tend to be present only in the outer rows of the field. Don't be influenced by what you think you may see from windshield surveys! Get out into fields to determine beetle activity.

Soybean: Soybean plants have the amazing ability to withstand considerable damage (defoliation) before yield is impacted. 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 25% defoliation from bloom to pod fill can be tolerated before yields are economically affected. This defoliation must occur for the whole plant, not just the upper canopy. The beetles often congregate in areas of a field where they are first attracted to weeds such as smartweed. Typically if economic damage occurs, it is only in these areas. Therefore, spot treatments should be considered. Don't be overly alarmed by these bright, iridescent beetles that feed on the top canopy of the soybean plants. Consider that as they feed their defoliation allows for better sunlight penetration into the lower plant canopy!

Grubs: Japanese beetle have developed from grubs feeding on organic matter and/or the roots of plants last fall and this spring. Therefore it seems logical that killing adult beetles this year should prevent grub damage in 2003. However it simply doesn't work that way. Researchers' attempts to draw in beetles to encourage them to lay eggs for subsequent grub damage in research plots have generally failed. Entomologists for years have been trying to understand this fickeled creature. Basically, the adults feed, mate, and lay eggs when and where they want to. The grubs are just as unpredictable. Research attempts to correlate grub presence to crop damage have usually shown insignificant differences. Damage does occur, but we are just not usually able to predict when or assess how much. Besides, each beetle mates and lays eggs several times during its oviposition period. To prevent egg laying in a field, one would need to treat multiple times during July and August.

Some producers have purchased Japanese beetle traps and have placed them where beetles have congregated. The "bag-a-bug" type trap can utilize both a pheromone and a floral scent to attract both sexes of the beetle. However, these traps are NOT recommended for beetle management because they attract more beetles than they control, resulting in localized plant damage.

Should controls be needed, refer to publications E-219, *Corn Insect Control Recommendations – 2002*, or E-77, *Soybean Insect Control Recommendations – 2002* for labeled products. These and other field crop related publications can be viewed electronically at <http://www.entm.purdue.edu/entomology/ext/targets/e-series/fieldcro.htm>.

Japanese beetles "party" on ear tip

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Black Light Trap Catch Report
(Ron Blackwell)

County/Cooperator	6/18/02 - 6/24/02							6/25/02 - 7/1/02						
	VC	BCW	ECB	SWCB	CEW	FAW	AW	VC	BCW	ECB	SWCB	CEW	FAW	AW
Clinton/Blackwell	0	3	41	0	0	0	0	0	2	4	0	0	0	0
Dubois/SIPAC	7	1	0	0	0	0	8							
Jennings/SEPAC	0	0	0	0	0	0	2							
Knox/SWPAC	5	2	0	0	0	0	0	1	0	0	0	0	0	0
LaPorte/Pinney Ag Center	0	0	272	0	0	0	2							
Lawrence/Feldun Ag Center	0	1	0	0	0	0	5							
Randolph/Davis Ag Center	0	1	11	0	0	0	1							
Vermillion/Hutson	0	0	2	0	0	0	0	0	2	2	0	0	0	2
Whitley/NEPAC	0	0	45	0	0	0	0							

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

Plant Diseases

Corn Leaf Diseases – (*Gregory Shaner*) –

- Hot, humid weather may promote leaf diseases in corn

Although the rains have finally let up, the humid weather we are experiencing creates good conditions for corn leaf diseases. I found what appear to be young lesions of gray leaf spot and a few pustules of common rust in a field of seed corn south of Indianapolis on July 1. The plants were at the V10 stage of growth, and lesions were present on V5 through V9.

The gray leaf spot fungus, as well as several other corn leaf spotting fungi, survive between seasons on corn residue. Under warm, moist conditions, these fungi

produce spores on this residue. The spores are dispersed by wind or rain splash. Those that happen to land on corn leaves can infect and initiate disease in the crop.

Spores of the gray leaf spot fungus require relative humidity of 95% or greater to germinate. The spore produces a germ tube that grows over the surface of the leaf. Eventually the germ tube forms a terminal swelling, from which the fungus invades the leaf. From that point, growth is internal and finally results in a visible lesion.

Compared to many fungi, the time between when a spore of the gray leaf spot fungus germinates and when the fungus penetrates the corn leaf can be long. In her Master's thesis research, Dr. Peggy Sellers found that this process required 48 to 72 hours at a relative humidity of 95% or greater. It may seem as though the relative humidity has been constantly above 95% for the past several days, but examination of hourly weather data from around Indiana shows that RH has been dropping to 50% or lower for several hours during mid day. However, the gray leaf spot fungus is adapted to interruptions in conditions necessary for spore germination and penetration. Germinated spores can survive several hours at lower RH, and then resume the infection process when RH rises to 95% or greater. The lower limit of RH for survival of germinated spores is not known precisely, but Sellers found that germinated spores held for 12 hours per day at 60% RH remained viable. Although hourly weather data for the past week in Indiana show that RH has dropped to 50% or a bit lower for several hours each day at many locations, it is likely that RH on the surface of a corn leaf even during mid day is above 60%.

So, it would seem that conditions are favorable for gray leaf spot development. Gray leaf spot appeared in many corn fields in Indiana last year, late in the season. Residue from this corn contains the fungus. This supply of inoculum, coupled with the favorable weather of the past couple of weeks, suggests that the disease is becoming established in the 2002 corn crop. Whether gray leaf spot becomes a serious problem depends on weather during July and August and the degree of resistance in the corn.

Unlike the gray leaf spot fungus and many other leaf blighting fungi of corn, the common rust fungus does not survive on residue. This fungus requires a living host plant to grow and reproduce. Spores are introduced into the Midwest each year by southerly winds from tropical and sub-tropical regions where the fungus overwinters. Rust can complete a generation (from infection to the production of a spore-bearing pustule) in as few as 7 days. The fungus has tremendous reproductive capacity on a susceptible variety. Fortunately, most corn hybrids have a degree of resistance that greatly inhibits reproduction by the fungus. Some pustules will develop, but they normally do not become numerous enough to damage the plant. Many inbreds and sweet corn hybrids are more susceptible, and may be damaged. Where fungicides are used, scouting should begin now (if not already begun) to time treatment early in disease onset.

Weeds

Dry Weather and Weed Control - (*Mark Loux, The Ohio State University*) -

Some areas of the state are experiencing dry conditions, and the resulting moisture-stressed weeds can reduce the effectiveness of postemergence herbicides. Our experience with dry weather and weed control can be summarized as follows:

Under dry conditions, control of large weeds can be especially difficult. Postemergence herbicides seem to maintain their effectiveness on small weeds even under dry conditions. If you are delaying application to control later-emerging weeds, keep in mind that emergence of additional summer annual weeds should be minimal this late in the season.

Antagonism between grass and broadleaf herbicides, which reduces grass control, is more likely under dry conditions. Antagonism is most problematic when trying to control yellow foxtail, branyardgrass, or crabgrass, but can occur with giant foxtail. To reduce the risk of antagonism, increase grass herbicide rates, apply when grasses are small, and/or apply grass and broadleaf herbicides separately. Grass herbicides are most effective when applied with crop oil concentrate, and use of surfactant will increase the risk of antagonism.

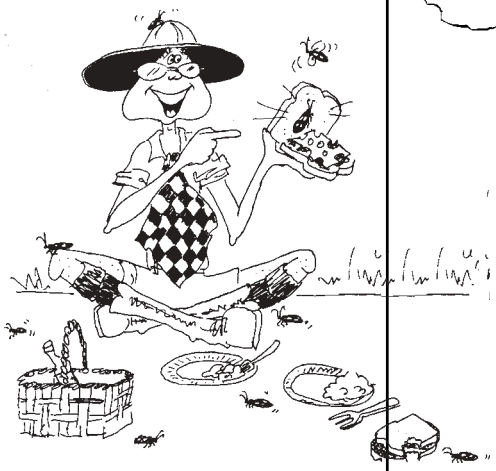
Regarding the decision to wait for a rain before applying herbicides, we suggest the following strategy: If rain is likely within the next few days, waiting may improve control. However, if rain in the near future is not likely, go ahead and apply before weeds become larger and even more difficult to control.

Weather Update

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

Temperature Accumulations from Jan. 1 to July 3, 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



Bug Scout says, "Enjoy your 4th of July weekend!"

4" Bare Soil Temperatures 7/3/02

Location	Max.	Min.
Wanatah	96	80
Winamac	95	75
W Laf Agro	91	79
Tipton	87	79
Farmland	91	71
Perrysville	85	77
Crawfordsville	77	72
Terre Haute	88	78
Vincennes	88	76
Oolitic	95	79
Dubois	100	78

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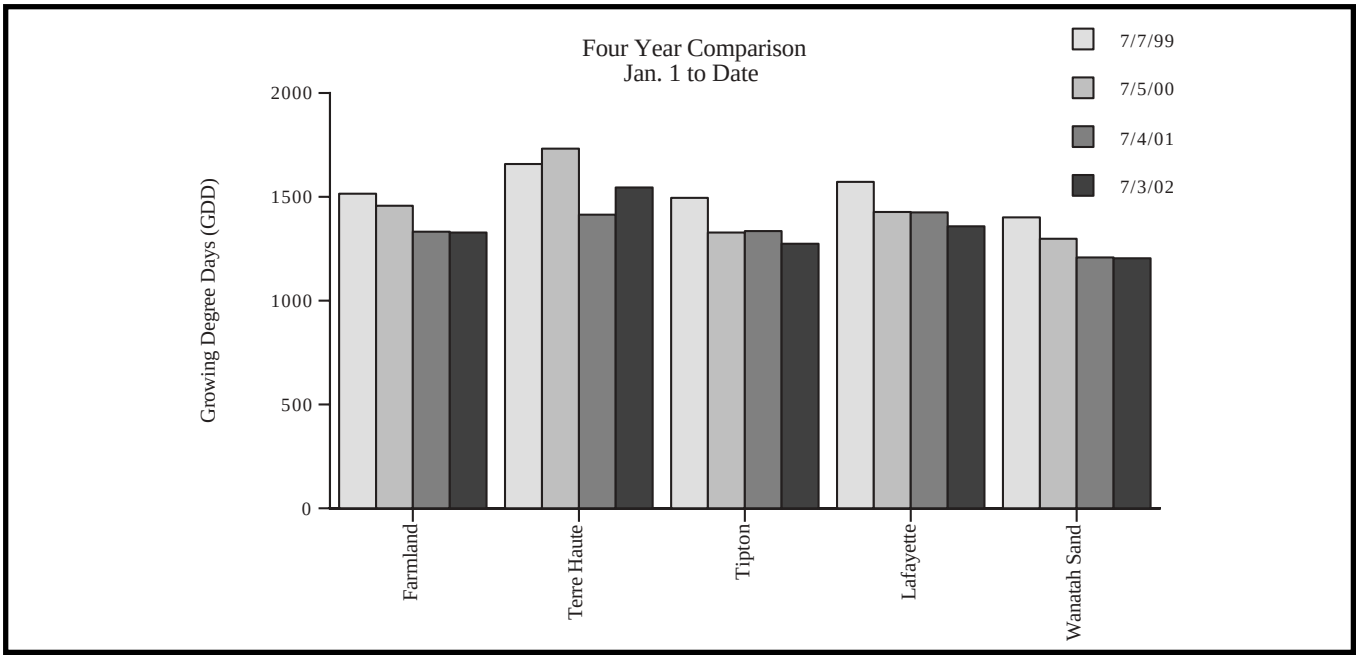

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