Pest & Crop

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In This Issue

Insects, Mites, and Nematodes

First Generation European Corn Borer Remains Unimpressive – (*John Obermeyer and Larry Bledsoe*) –

- Moth flights have been low
- Scouting efforts should concentrate on most mature corn
- Steps to determine treatment threshold given below
- YieldGard for corn rootworm needs to be scouted for corn borer

Black light moth counts of European corn borer have remained low throughout the first generation. Apparently, low levels of overwintering larvae and the cool growing season have combined to reduce the first brood population. Though moth numbers picked up a little during the second week of June, much of the corn was too short to be an attractive egg laying site.

Pest managers should concentrate their scouting efforts on the lush and tallest corn in the area. Survey for the characteristic random or "shot hole" damage pattern down in the corn whorl of 20 consecutive plants in each of 5 areas of the field. Carefully examine the whorl leaves on each plant as some of the holes can be small. Count and record the number of plants showing foliar feeding damage. Total the number of plants showing such damage to determine the percentage of damaged plants. Also, determine if borers are still present and actively feeding. Pull out, carefully unroll, and examine the whorl leaves from one plant showing damage in each sample set, for a maximum of 5 plants in the entire field. Total the number of live borers found and determine the average number of borers per plant.

Shot hole damage in corn whorl

Use the following steps to determine whether an insecticide treatment is economically justified:

1) Preventable yield loss (bu/A) = anticipated yield (bu/A) X yield loss figure (following table) X level of infestation (decimal) X anticipated level of control (decimal). It is probably impractical to expect 100% control. A good estimate of control might be 75%.

2) Preventable dollar loss/A = Preventable yield loss (bu/A) X market value ($/bu).

3) Compare preventable dollar loss/A to cost of insecticide and application to determine if treatment is warranted.

Yield Losses Caused by European Corn Borers for Various Corn Growth Stages[1]

	Percent yield loss - # borers/plant[2]		
Plant stage	**1**	**2**	**3**
Early whorl	5.5	8.2	10.0
Late whorl	4.4	6.6	8.1
Pre-tassel	6.6	9.9	12.1
Pollen shedding	4.4	6.6	8.1
Blister	3.0	4.5	5.5
Dough	2.0	3.0	3.7

[1] These percentages are based on physiological stresses and do not include losses due to stalk breakage and/or ear dropage.

[2] For more than 3 borers/plant, use percent yield loss figure for 3 borers, or adjust loss slightly upward.

Example: A field in the early whorl stage has 80% of the plants with "shot-hole" feeding and an average of 2 live larvae per whorl. Anticipated yield is 150 bu/A and the crop is valued at $2.00 per bushel. The cost of the insecticide and application is $10.00 and 75% control can be expected. Would it pay to apply the insecticide?

1) Preventable yield loss (bu/A) = 150 bu/A X .082 (8.2% loss for 2 borers/plant) X .80 (80% infestation) X .75 (75% control) = 7.38 bu/A

2) Preventable dollar loss/A = 7.38 bu/A X $2.00/bu = $14.76/A

3) Compare preventable dollar loss/A with cost of control/A

$14.76/A (preventable $ loss/A) - $10.00/A (cost of control) = $4.76/A return from application of control.

Don't be confused by types of Bt corn! The newly approved transgenic corn, YieldGard for rootworm, has NO suppression or control of corn borer. Therefore, it would be wise for pest managers to be scouting this corn for borer damage. Likely in the near future, YieldGard will come "stacked" for both corn borer and rootworm control.

A QuickTime movie of first generation European corn borer sampling can be viewed at <http://www.entm.purdue.edu/entomology/ext/fieldcropsipm/videos.htm>. For recommended insecticides, see E-219, *Corn Insect Control Recommendations – 2003*. This and other field crop related publications can be viewed electronically at <http://www.entm.purdue.edu/entomology/ext/targets/e-series/fieldcro.htm>.

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Potato Leafhopper Populations On the Rise - (*John Obermeyer and Larry Bledsoe*) -

- Regrowth is most at risk to feeding damage
- Damage has already occurred once "hopper burn" is noticed

Populations of potato leafhopper in alfalfa fields and black light traps have been rising throughout the state. There have been observations of high numbers of leafhoppers coming to lights at night. Undoubtedly, the warmer temperatures have contributed to this increase.

Producers are encouraged to inspect new growth soon after cutting for potato leafhopper; this is when alfalfa is most susceptible to feeding, leading to reduced yields and protein levels. Remember, once yellowing or "hopper burn" is seen, the damage has already been done. Refer to *Pest&Crop* #12, for sampling and management guidelines. For recommended insecticides, see E-220, *Alfalfa Insect Control Recommendations – 2003*. This and other field crop related publications can be viewed electronically at <http://www.entm.purdue.edu/entomology/ext/targets/e-series/fieldcro.htm>.

Close-up of an adult potato leafhopper

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Japanese Beetle Season Begins!– (*John Obermeyer*) –

Reports of Japanese beetle emergence are beginning. This year, our first report comes from the Indianapolis Zoo (June 18). Most likely folks in the southern counties had seen them several days earlier. In a week or so, they'll become apparent to everyone in the state. Since grub damage reports were down this year, perhaps we'll have fewer beetles to deal with. Watch for more information in upcoming issues of the *Pest&Crop*..

They're Here!!!!

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Soybean Aphid Update – (*John Obermeyer*) –

Last week we reported that the first soybean aphid were found at the Agronomy Center for Research Education (Tippecanoe County) on June 11. This week (June 17), aphids have been found in Cass and Whitley Counties. Updates and information on sampling are forthcoming in future issues of the *Pest&Crop*.

Soybean aphids

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Black Light Trap Catch Report
(Ron Blackwell)

County/Cooperator	6/3/03 - 6/9/03							6/10/03 - 6/16/03						
	VC	BCW	ECB	SWCB	CEW	FAW	AW	VC	BCW	ECB	SWCB	CEW	FAW	AW
Dubois/SIPAC	1	0	18	0	0	0	3	0	0	1	1	0	0	0
Jennings/SEPAC	0	0	26	0	0	0	1	0	0	21	0	0	0	2
Knox/SWPAC	0	1	7	1	0	1	1	0	0	2	1	2	0	2
LaPorte/Pinney Ag Center	0	0	25	0	0	0	1	0	0	103	0	0	0	9
Lawrence/Feldun Ag Center	0	0	3	0	0	0	3	0	0	0	0	0	0	1
Randolph/Davis Ag Center	0	0	27	0	0	0	0	0	0	33	0	0	0	0
Tippecanoe/Throckmorton Ag Center	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Whitley/NEPAC	0	0	28	0	0	0	0	0	0	135	0	0	0	14

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

Harvest Aid Herbicides for Winter Wheat - (*Bill Johnson, Glenn Nice and Tom Bauman*) -

The following herbicides (Table) are labeled for use as harvest-aid treatments in winter wheat. These herbicides cannot be used before the hard dough stage of wheat (30% grain moisture or less). Keep in mind that it is likely that weed growth in wheat at that time likely be over 1 foot tall when wheat is in the hard dough stage. In addition, because weeds will be large, it will take 5 to 15 days for herbicides to desicate the weeds. Therefore we recommend the use of full labeled rates and tankmixes to increase the chance of success on large weeds. Labeled tankmix partners for harvest aid treatments in wheat include 2,4-D + glyphosate and 2,4-d Clarity, and Clarity + glyphosate. If soybean will be double-cropped after wheat harvest, it would be advisable to avoid use of 2,4-D and Banvel/Clarity because of the required recropping interval.

Table 1. Herbicides labeled for use as winter wheat harvest-aid treatment

Herbicide and formulation	Formulated product rate	Weeds controlled	Application method and precautions
2,4-D amine or ester (4 lb./gallon formulations	1 to pts./A	Suppression of wild garlic, wild onion	Apply when wheat is in the hard dough (30% or and broadleaf weeds less grain moisture) stage. Ester formulation may be more active on garlic. Underseeded legumes will be severely injured. Do not graze within 2 weeks after application. Do not use treated straw for livestock feed. If the 1 pt./A rate is used, no not plant soybean for 7 (ester) or 15 days (amine) after planting. If the 2 pt./A rate is used, do not plant soybean for 30 days after application.
Glyphosate (Roundup and other formulations)	16 to 32 oz./A the 3 lb. acid equivalent formulation, 11 to 22 oz./A of Roundup Weathermax	Suppression of grass and broadleaf weeds	Apply when small grains are in the hard dough stage. Do not apply to wheat grown for seed. Stubble can be grazed immediately after harvest.
Clarity	8 oz./A	Suppression of broadleaf weeds	Apply when wheat is in the hard dough stage and green color is gone from stem. A waiting period of 10 to 14 days is required before harvest. Do not graze or use feed from treated area. Do not plant soybean for 14 days after application.

Plant Diseases

Wheat Diseases – (*Gregory Shaner*) –

- Severe disease in southern Indiana

Scab (*Fusarium* head blight) is severe in southern Indiana. Incidence of blighted heads ranges from 10% to 80% in variety trials near Vincennes, Butlerville, and Evansville. The disease is likely to be equally severe in commercial wheat fields throughout this region.

When healthy heads are still green, it is easy to spot blighted heads because they are prematurely white. The entire head or only a portion of the head may be blighted. Once healthy heads begin to lose their color, as kernels progress to the soft dough stage of development, it is more difficult to assess the amount of scab based on the frequency of blighted heads. By this stage of development, there is not a striking difference between blighted heads and heads that are turning white naturally. If the air is humid, blighted heads may have a conspicuous salmon-pink color at the base of spikelets, whereas naturally maturing, healthy heads will not. In the corn belt, the fungus *Fusarium graminearum* is the primary cause of scab, but other species of *Fusarium* may also be involved. Masses of spores produced by *Fusarium graminearum* on infected heads are the source of the pink color.

Spikelets infected early by the scab fungus may not produce any grain. Spikelets infected later may produce small, shriveled kernels that have a dull white or pinkish cast. These are referred to as tombstones, and the endosperm of such kernels is largely replaced by mycelium of the fungus. However, even kernels that appear to be healthy may be infected by *Fusarium graminearum*.

In addition to the low yield and test weight that a field with scab will produce, there is the added concern of mycotoxins in the grain. These are toxic compounds produced by the fungus. The principal mycotoxin produced by *Fusarium graminearum* is deoxynivalenol, commonly referred to as DON or vomitoxin. In general, the greater the incidence of visibly scabby grain in a sample of wheat, the greater the level of DON. Tombstones can have very high levels of DON, but grain that is not visibly scabby may also contain the toxin.

The US Food and Drug Administration advises that finished wheat products contain no more than 1 ppm DON. End-point grain buyers generally consider 2 ppm in whole grain to be a threshold above which the grain may be considered unsuable for food products. If wheat is diverted to animal feed, the FDA advises that grain contain no more than 10 ppm DON if it is fed to cattle or chickens, and that the scabby grain makes up no more than 50% of the ration. Swine are particularly sensitive to DON. The name vomitoxin was coined after it was realized that eating scabby grain induced vomiting in swine, which can lead to feed refusal and loss of weight. Wheat used in swine feed should contain no more than 5 ppm DON and constitute at most 20% of the ration.

Scab is not the only problem afflicting wheat in Indiana. Leaf and glume blotch, caused by *Stagonospora nodorum*, is also severe in many fields, particularly in southern Indiana. *Stagonospora* infections cause premature leaf death and browning of heads. This fungus does not produce a toxin, but the premature killing of leaves and heads results in low yield and test weight.

Earlier, stripe rust was thriving in many wheat fields. This is a rust that normally does not appear in the Midwest. The cool, wet weather of May provided ideal conditions for this rust, and it has shown up in many wheat fields, but not to such extent as to cause serious reduction of yield or test weight. With the arrival of warm weather, the stripe rust lesions are drying up.

Close-up of stripe rust of wheat leaf

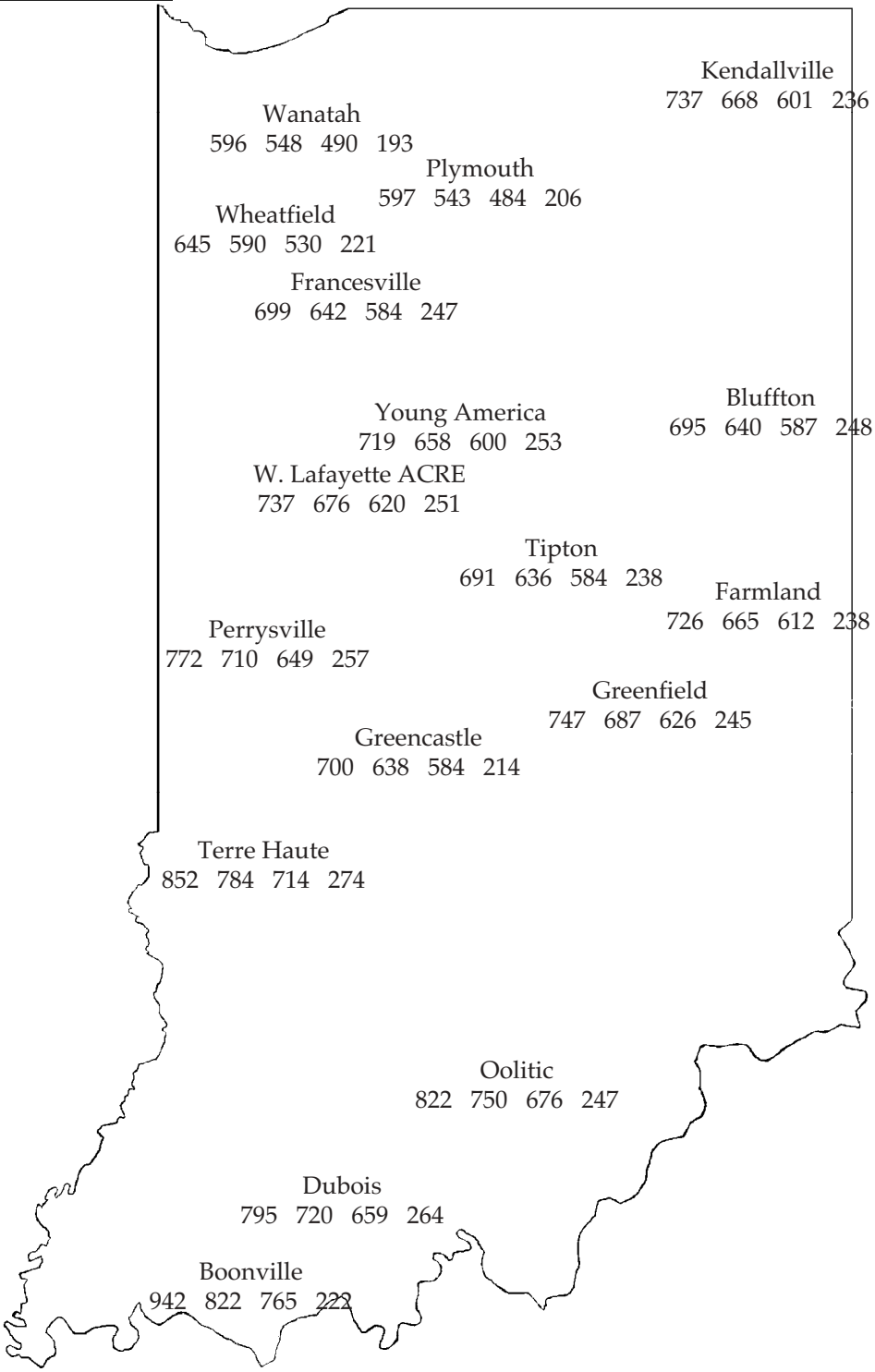
Weather Update

Temperatures as of June 18, 2003

GDD(9) = Growing Degree Days from April 16 (9% of Indiana's corn planted), for corn growth and development
GDD(26) = Growing Degree Days from April 25 (26% of Indiana's corn planted), for corn growth and development
GDD(50) = Growing Degree Days from April 30 (50% of Indiana's corn planted), for corn growth and development
GDD(85) = Growing Degree Days from June 4 (85% of Indiana's corn planted), for corn growth and development

MAP KEY

Location
GDD(9) GDD(26) GDD(50) GDD(85)



4" Bare Soil Temperatures 6/18/03

Location	Max.	Min.
Wanatah	84	65
Columbia City	74	63
Winamac	75	65
Bluffton	69	68
W Laf Agro	82	68
Tipton	80	71
Farmland	73	63
Perrysville	74	67
Crawfordsville	80	69
Terre Haute	84	70
Oolitic	80	66
Dubois	87	68

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