Pest & Crop

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

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In This Issue

Insects, Mites, and Nematodes

Soybean Aphid at All Time Highs in Northern Indiana – (*John Obermeyer, Larry Bledsoe, and Bob O'Neil*)

- Soybean aphid numbers have dramatically increased in northern Indiana
- Aphid abundance in the field is not obvious from the roadside
- Plants in early pod development seem most prone to yield losses
- Suggested treatment guidelines and products given

Calls from northern Indiana counties indicate that numerous aphids are being found in soybeans. Most pest managers are finding the aphids by accident, in that they were not aware of aphids until they entered fields for some other reason. Hundreds of aphids on the new soybean growth (leaves, petioles, and stems) is a common site in these infested fields. Sticky residue, aphid honeydew, is being noted on lower leaves (described by one producer as "looks like leaves sprayed with WD40").

Purdue researches investigating this pest have been weekly monitoring fields from Lafayette to the northern tier of Indiana. All fields approximately north of US 24 have seen a doubling of aphid populations in the last week. Northern most counties are reporting the most dramatic aphid numbers, two fields near Lake Michigan with one thousand or more aphids per plant. Interestingly, even at these high numbers, plant damage from the field edge was not obvious. Once in these fields, one only need to look at their pant's legs smeared with aphids and honeydew to know that something wasn't right! Besides the tremendous aphid numbers in these fields, two disturbing observations were made: 1) natural enemy numbers were very low, and 2) many of the aphids are beginning to develop wings, meaning they will soon be migrating and infesting new locations.

Damaged leaves from soybean aphid

As discussed in last week's *Pest&Crop*, treatment decisions are not clear-cut. Normal stress areas or poor soils may provide a visual indicator as infested plants begin to yellow from the aphid feeding. This may not work in fields with productive soils and good moisture

levels. Monitoring fields bi-weekly from full flower through early pod set and development is recommended. Research conducted in 2001 indicated that this is the critical time for aphid control and yield protection. If most plants throughout a field have hundreds of aphids (200+) on the plants then treatment may be justified. As emphasized in last week's article, it is extremely important to assess aphid-infested fields for beneficial organisms before management decisions are made. Experiences in 2001 showed that aphid populations can crash quickly from predators and/or pathogens.

Field yellowing from soybean aphid

Should control be necessary, complete coverage on the foliage seems to be the key. Ground driven rigs applying at least 20 gallon per acre with 40 PSI will help penetrate the canopy. Products labeled for soybean aphid control include Lorsban 4E (2 pints/acre), Mustang Max (3–4 ounces/acre), Penncap M (3 pints/acre), and Warrior (2-3 ounces/acre). All of these products are restricted use products. Please follow all label rate, application, and use directions.

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Black Light Trap Catch Report
(Ron Blackwell)

County/Cooperator	7/15/03 - 7/21/03							7/22/03 - 7/28/03						
	VC	BCW	ECB	SWCB	CEW	FAW	AW	VC	BCW	ECB	SWCB	CEW	FAW	AW
Dubois/SIPAC	4	2	1	0	0	0	2	1	0	5	0	0	0	1
Jennings/SEPAC	8	5	0	0	1	1	3	3	1	1	0	0	1	10
Knox/SWPAC	2	1	0	0	0	0	5	1	2	0	0	1	0	2
LaPorte/Pinney Ag Center	8	2	0	0	0	1	5	2	1	1	0	0	1	7
Lawrence/Feldun Ag Center	1	0	0	0	0	0	1	0	1	0	0	0	1	5
Randolph/Davis Ag Center	4	2	0	0	0	0	10							
Tippecanoe/Throckmorton Ag Center	0	0	0	0	0	0	2							
Whitley/NEPAC	32	5	0	0	0	0	25	4		7				11

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

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Now is a Critical Time for Soybean Defoliation - *(John Obermeyer and Larry Bledsoe)* -

- Insect damage varies from field to field
- Pod fill is the critical time for soybean defoliation
- Identify insect defoliators, determine level of defoliation, and note crop growth stage
- While in the soybean fields, watch for western corn rootworm beetles

We have begun to sample soybean fields with sweep nets for the presence of western corn rootworm beetles. While doing so, we capture and record other insects. So far, overall insect numbers seem to lower than "normal." That's good news. However, an occasional field with no known reason will have a surprisingly high number of insects and damage. This only emphasizes that each field should be scouted separately.

Bean leaf beetle, Japanese beetle, grasshoppers, and green cloverworm all feed-on soybean leaves. And even though soybeans have the amazing ability to withstand damage from defoliation, yield losses can occur. The impact of defoliation is greatest during pod fill because of the importance of leaf area to photosynthesis and, ultimately, yields.

The best management guidelines for soybean defoliators involve identifying the insect pests and then characterizing the level of defoliation and growth stage of the beans. Then, management decisions will depend on anticipated market price of the soybeans, cost of treatment, the level of damage, the growth stage of the soybean, and potential yield. At mid pod fill, consider treatment when defoliation exceeds approximately 15 to 20% and the defoliator(s) is still present and actively feeding. Refer to the following table for treatment thresholds for insect defoliated soybeans.

Western corn rootworm beetles they will feed on soybean foliage, but this is not of concern to soybean yield. However, their presence in soybean could signal the need to control larval population in next year's corn. Refer to last week's

Pest&Crop on sampling in this year's soybean fields with yellow sticky traps. A Flash animation of sampling rootworm beetles in soybean can be viewed at <http://www.entm.purdue.edu/entomology/ext/fieldcropsipm/animation.htm>.

TREATMENT THRESHOLDS FOR INSECT DEFOLIATED SOYBEANS

PERCENTAGE DEFOLIATION*

Soybean growth stage	Market price - $5/bu Cost of treatment $6/A	$8/A	$10/A	$12/A	$14/A	Market price - $6/bu Cost of treatment $6/A	$8/A	$10/A	$12/A	$14/A
V1-2	40-50	45-55	50-60	45-55	55-65	35-45	40-50	45-55	45-55	50-60
V3-4	40-50	45-55	50-60	55-65	55-65	40-50	45-55	45-55	50-60	50-60
V5-6	45-55	45-55	50-60	55-65	55-65	40-50	45-55	50-60	50-60	50-60
V7+	40-50	40-50	45-55	50-60	55-65	35-45	40-50	40-50	45-55	50-60
R1	25-35	30-40	35-45	40-50	40-50	25-35	25-35	30-40	30-40	35-45
R2	20-30	25-35	30-40	35-45	35-45	20-30	25-35	25-35	25-35	30-40
R3	15-25	20-30	20-30	25-35	25-35	10-20	15-25	20-30	20-30	20-30
R4	10-20	15-25	15-25	20-30	20-30	10-20	10-20	15-25	15-25	20-30
R5	15-25	15-25	20-30	20-30	25-35	10-20	15-25	15-25	15-25	20-30
R6	15-25	20-30	25-35	25-35	30-40	10-20	20-30	25-35	25-35	30-40

PERCENTAGE DEFOLIATION*

Soybean growth stage	Market price - $7/bu Cost of treatment $6/A	$8/A	$10/A	$12/A	$14/A	Market price - $8/bu Cost of treatment $6/A	$8/A	$10/A	$12/A	$14/A
V1-2	35-45	40-50	40-50	40-50	45-55	30-40	35-45	40-50	40-50	45-55
V3-4	35-45	40-50	45-55	45-55	45-55	35-45	40-50	40-50	40-50	45-55
V5-6	40-50	45-55	45-55	45-55	50-60	40-50	40-50	45-55	45-55	45-55
V7+	35-45	35-45	40-50	40-50	45-55	35-45	35-45	40-50	40-50	45-55
R1	20-30	25-35	30-40	30-40	30-40	20-30	25-35	25-35	30-40	30-40
R2	15-25	20-30	25-35	25-35	25-35	15-25	20-30	20-30	25-35	25-35
R3	10-20	15-25	15-25	15-25	20-30	10-20	15-25	15-25	15-25	20-30
R4	10-20	10-20	10-20	15-25	15-25	5-15	10-20	10-20	15-25	15-25
R5	10-20	10-20	15-25	15-25	20-30	10-20	10-20	15-25	15-25	15-25
R6	15-25	15-25	20-30	20-30	25-35	10-20	15-25	20-30	20-30	20-30

* The defoliation level needed before a control is applied will vary somewhat depending on insect numbers and stage of development, growing conditions, variety grown, expected yield, economic factors, and plant population counts. All of these factors must be taken into consideration when making control decisions. The defoliation figures are shown as a range in each category. This range is included so that limiting factors can be considered. When few limiting factors are present, the control decision value will normally be at the higher end of the scale. Under some circumstances or conditions management guidelines given above may need to be adjusted from what is given. Based on 50 bushel per acre yield.

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Weeds

Dandelion Control with Late Spring Applied Teatments in No-till Corn - *(Earl Creech and Bill Johnson)*

The adoption of no-till cropping systems in Indiana has led to an increase in troublesome perennial weeds in crops. Dandelion is one such weed that has become a cause of concern for many people throughout the state. To help us better address the many questions that have been directed toward us this spring, we established a couple of field experiments to examine a number of herbicide programs directed toward dandelion control.

In the first experiment, our goal was to evaluate dandelion control with late spring applied treatments. A primary objective was to obtain a relatively quick burn-down of top growth. On May 8, herbicide treatments were applied to no-till plots that were subsequently planted into corn. Initial ratings were collected 14 days after treatment (DAT) and revealed that the best treatments were generally those which contained Gramoxone Max (Table 1). Lumax alone controlled dandelion 71% while the addition of Gramoxone Max increased control to 94% or greater. Similarly, Bicep II Magnum + 2,4-D and Bicep II Magnum + 2,4-D + Gramoxone Max provided 38% and 89% control of dandelion, respectively. At 41 DAT, dandelion control in the Lumax + Gramoxone Max

treatments had decreased to ~80%, a level similar to Lumax + 2,4-D (84%). A much more significant reduction in control was observed with Bicep II Magnum + Gramoxone Max which had decreased to ~50%. In contrast to the initial evaluations, the treatment combinations containing Roundup Weathermax received the highest ratings (92%) at 41 DAT.

Based on our observations concerning Lumax + Gramoxone Max at 14 DAT in the previous study, we established another trial to examine the interaction between these two products more closely. Callisto (one component of the Lumax premix) at 3 and 6 oz/A controlled dandelion 68% and 80%, respectively (Table 2). The addition of atrazine to Callisto has been reported to improve Callisto activity on a number of weeds but had no effect on dandelion control in this study. Although initial (11 DAT) activity was ~4-fold higher than Callisto alone, dandelion control in the Callisto + Gramoxone Max treatments was 8-15% less than a similar rate of Callisto alone at 35 DAT. This decrease in activity may be the result of the Gramoxone Max destroying the above-ground plant tissue so rapidly that the Callisto did not have adequate opportunity to absorb through the foliage and translocate into the roots.

These studies demonstrate the burn-down potential of a number of herbicides on established dandelion. Gramoxone Max is a contact product that rapidly destroys the above ground dandelion parts. Translocated herbicides such as Lumax, Callisto, and Roundup Weathermax were essential to control dandelion 5-6 weeks down the road.

Table 1. Dandelion control with late spring applied treatments in no-till corn at 14 and 41 days after treatment (DAT) at a study site near West Lafayette, IN (2003).

Treatment	Rate	Dandelion Control 14 DAT	41 DAT
		%	
Lumax	6 PT/A	71	63
Lumax + 2,4-D	6 PT/A + 1 PT/A	57	84
Lumax + Gramoxone Max	6 PT/A + 1.3 PT/A	94	80
Lumax + Gramoxone Max + 2,4-D	6 PT/A + 1.3 PT/A + 1 PT/A	95	84
Bicep II Magnum + 2,4-D	4.2 PT/A + 1 PT/A	38	52
Bicep II Magnum + Gramoxone Max	4.2 PT/A + 1.3 PT/A	71	48
Bicep II Magnum + Gramoxone Max + 2,4-D	4.2 PT/A + 1.3 PT/A + 1 PT/A	89	52
Roundup Weathermax + Bicep II Magnum	1.37 PT/A + 4.2 PT/A	39	92
Roundup Weathermax + 2,4-D + Bicep II Magnum	1.37 PT/A + 1 PT/A + 4.2 PT/A	51	92
Bicep II Magnum + Hornet	4.2 PT/A + 3 OZ/A	24	35
Bicep II Magnum + Hornet + 2,4-D	4.2 PT/A + 3 OZ/A + 1 PT/A	49	81
LSD (0.05)		12	19

Table 2. Dandelion control with Callisto based programs at 11 and 35 days after treatment (DAT) at a study site near West Lafayette, IN (2003).

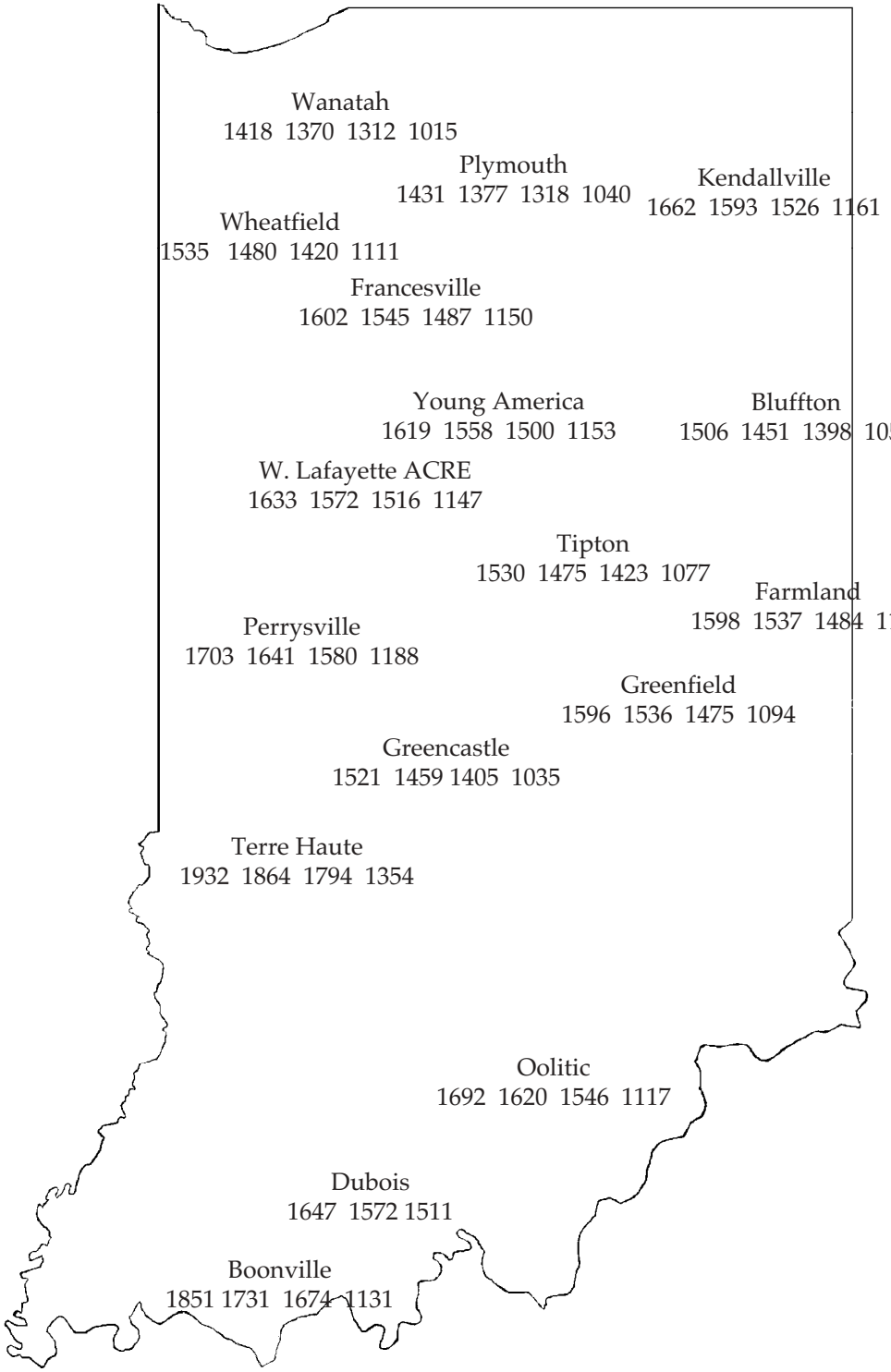
Treatment	Rate	Dandelion Control 11 DAT	35 DAT
		%	
Callisto	6 OZ/A	22	80
Callisto	3 OZ/A	26	68
Atrazine	1 PT/A	8	10
Callisto + Atrazine	6 OZ/A + 1 PT/A	26	79
Callisto + Atrazine	3 OZ/A + 1 PT/A	18	68
Gramoxone Max	2.7 PT/A	73	26
Gramoxone Max	1.35 PT/A	60	16
Callisto + Gramoxone Max	6 OZ/A + 2.7 PT/A	86	66
Callisto + Gramoxone Max	6 OZ/A + 1.35 PT/A	81	65
Callisto + Gramoxone Max	3 OZ/A + 2.7 PT/A	83	60
Callisto + Gramoxone Max	3 OZ/A + 1.35 PT/A	78	53
Lumax	3 QT/A	24	78
Lumax + Gramoxone Max	3 QT/A + 2.7 PT/A	85	86
Lumax + Gramoxone Max	3 QT/A + 1.35 PT/A	66	80
LSD (0.05)		11	15

Weather Update

Temperatures as of July 30, 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 7/30/03

Location	Max.	Min.
Wanatah	85	65
Columbia City	66	53
Winamac	83	62
Bluffton	61	55
W Laf Agro	83	66
Tipton	83	78
Farmland	78	62
Perrysville	76	70
Terre Haute	75	67
Oolitic	81	66
Dubois	89	67

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