Pest & Crop

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Insects, Mites, and Nematodes

Grain Bin Clean-Up - (*Linda Mason and John Obermeyer*) -

- Stored grain insect infestations usually begin from poor sanitation
- Procedures are given to prevent infestations
- Now is the time to carry out bin clean-up procedures

Many grain bins have recently been emptied and preparation should begin for this year's harvest. Storage facilities should be readied for corn that will likely carryover to next spring or summer. Preparing bins for storage now goes a long way toward preventing insect infestations. Several species of insects may infest grain in storage. The principal insects that cause damage are the adult and larval stages of beetles, and the larval stage of moths. Damage by these insects includes reducing grain weight and nutritional value, and by causing contamination (as live or dead insects), odor, mold, and heat damage that reduce the quality of grain.

Newly harvested corn may become infested with insects when it comes in contact with previously infested grain in combines, truck beds, wagons, other grain-handling equipment, augers, bucket lifts, grain dumps, or grain already in the bin. Insects may also crawl or fly into grain bins from nearby accumulations of old contaminated grain, livestock feeds, bags, litter, any other cereal products, or rodent burrows.

Insect infestations can be prevented by employing good management practices. Now that many grain bins are empty, the following guidelines should be used before the 2003-grain is placed in bins:

- Brush, sweep out and/or vacuum the combine, truck beds, transport wagons, grain dumps, augers, and elevator buckets to remove insect-infested grain and debris.

- In empty bins, thoroughly sweep or brush down walls, ceilings, ledges, rafters, braces, and handling equipment and remove debris from bins.

- Inside cleaned bins, spray wall surfaces, ledges, braces, rafters, and floors with an approved insecticide for empty bin use (New this year - Storcide (a mixture of chlorpyrifos-methyl and cyfluthrin), Reldan (chlorphyifos methyl), Tempo SC Ultra perimeter spray (Cyfluthrin), or

diatomaceous earth) to create a perimeter barrier. Outside, complete this barrier by treating the bases and walls up to 15 feet high, plus the soil around the bins.

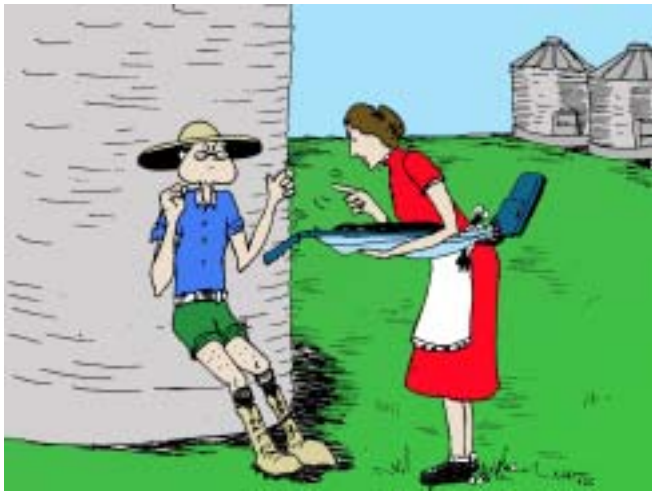
- Remove all debris from fans, exhausts, and aeration ducts (also from beneath slotted floors, when possible). Fumigate the false floor area if the bin has a history of insect infestation or you have not cleaned the false floor area recently. Only certified fumigation applicators may purchase and apply these.

- Remove all debris from the storage site and dispose of it properly according to area, state, and/or federal guidelines (the debris usually contains insect eggs, larvae, pupae, and/or adults, ready to infest the newly harvested grain).

- Remove all vegetation growing within ten feet of the bins (preferably the whole storage area). Then spray the cleaned area around bins with a residual herbicide to remove all undesirable weedy plants.
- Repair and seal all damaged areas to the grain storage structure. This is not only to prevent insect migration into the bin, but also to prevent water leakage, which leads to mold growth.

- Do not store newly harvested grain on old grain already in storage.

- Whenever fans are not operated, they should be covered and sealed. This reduces the opportunity for insects and vertebrates to enter the bin through the aeration system.



"Now Bug Scout! You know better than to use my good vacuum sweeper to clean these dirty ole bins!"

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Preliminary Soybean Sweep Counts of Western Corn Rootworm Beetles – (*John Obermeyer and Larry Bledsoe*) –

- Annual soybean sweeps have been completed
- A portion of the samples have been analyzed, numbers presented below

Sweep net samples taken from soybean fields from two-thirds of Indiana counties have just been completed. The intent of this survey is to compare relative numbers of western corn rootworm beetles throughout the state and then assign regional estimated risks to the following year's rotated corn. This survey has been ongoing since 1997 and it certainly has been interesting to compare beetle numbers throughout the years, and areas of the state.

The following table is a portion of this year's samples, tabulated to date, and compared to last year's numbers by county. Understand that these numbers are preliminary and many more samples are to be analyzed. It is difficult to draw conclusions at this time. Those that have been trapping with yellow sticky cards in soybean fields have been reporting fewer beetles than last year. Further updates and information is forthcoming in future issues of the *Pest&Crop*.

Western Corn Rootworm Sweep Net Survey in Soybean, 2002 & 2003

County	2002 WCR's/100 Sweeps*	2003 WCR's/100 sweeps*
Allen	88	28
Dekalb	72	129
Huntington	58	73
Lake	119	85
Lagrange	-	61
LaPorte	276	60
Noble	63	40
Porter	92	88
Starke	-	57
Wabash	84	101
Whitley	90	108

*Average of 2-3 fields sampled per county

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Black Light Trap Catch Report - (*John Obermeyer*)														
County/Cooperator	8/12/03 - 8/19/03							8/20/03 - 8/26/03						
	VC	BCW	ECB	SWCB	CEW	FAW	AW	VC	BCW	ECB	SWCB	CEW	FAW	AW
Dubois/SIPAC	0	28	1	0	0	1	1	0	41	4	0	6	1	1
Jennings/SEPAC	0	8	1	0	0	0	1							
Knox/SWPAC	0	2	10	1	1	0	1	0	4	12	2	0	0	1
LaPorte/Pinney Ag Center	0	0	61	0	0	0	0	0	0	222	0	0	0	0
Lawrence/Feldun Ag Center	0	9	1	0	1	0	6	0	22	2	0	8	0	2
Randolph/Davis Ag Center	0	0	92	0	0	0	0	0	2	88	0	0	0	0
Tippecanoe/TPAC Ag Center														
Vermillion/Hutson	1	3	75	0	0	0	0	1	9	29	0	0	0	0
Whitley/NEPAC	1	3	75	0	0	0	0							
VC = Variegated Cutworm, BCW = Black Cutworm, ECB = European Corn Borer, SWCB = Southwestern Corn Borer, CEW = Corn Earworm, FAW = Fall Armyworm, AW = Armyworm														

Bits & Pieces

Full of Beans: Purdue Field Day Covers Crop From Top to Bottom – (Steve Leer, *Purdue News Service*) -

Soybeans are Indiana's No. 2 cash crop, after corn. For at least one day in September the pod-setting plant will take over the top spot at Purdue University's Agronomy Center for Research and Education (ACRE).

Purdue's Soybean Field Day promises something for every soybean producer. More than seven hours of workshops and research plot tours are scheduled during the event, which takes place from 7:30 a.m. to 3 p.m. Sept. 9.

The field day is free, with lunch available for a charge. ACRE is located seven miles northwest of Purdue's West Lafayette, Ind., campus along U.S. 52.

Organizers have packed bushels of information into the field day, said Ellsworth Christmas, Purdue Extension soybean specialist and the event's co-chairman.

"This is a specialty-type field day, in that we're concentrating on soybeans," Christmas said. "Ninety-five percent of what is presented will be directly related to soybean production. Our target audience is producers, but we certainly welcome the agribusiness community as well."

Purdue specialists and researchers will address more than 20 different soybean issues.

"The topics, in broad categories, include insect management, disease management and weed control," Christmas said. "We'll also have a number of topics under what we call cultural practices. Those will include plant population, row spacing studies, tillage systems, fertility and others."

Three sessions certain to generate much interest pertain to machinery, plant breeding and the new soybean superpower a few thousand miles south of the United States.

"One of the tour stops will relate to belt metering devices for drills," Christmas said. "We've been doing research on belt meters at some of the regional Purdue farms where the devices have been installed on drills.

"We'll also have a stop where we're going to discuss soybean breeding for specialty traits, which seems to be a topic of interest among producers. Another topic of interest these days has to do with competition from South America. We've asked an individual who is familiar with soybean production in Argentina and Brazil to address the South American competition."

Other featured topics are:

- Insect management – Soybean aphid, pod feeders, leaf feeders and western corn rootworm variant.
- Disease management – Sudden Death Syndrome, white mold, phytophthora and other root rots, soybean rust, and foliar fungicides.

- Weed management – glyphosate resistance, fall-applied herbicides, timing and drift issues.

- Soybean cyst nematode – Extent of the problem, development of resistant varieties, CystX SCN-resistant varieties and the nematode's relationship with winter annual weeds.

- Handling soybeans for identity preservation and quality.

- Effect of ozone and ultraviolet radiation on soybeans.

- Farm safety and ammonia theft.

Also planned is a market outlook update from Chris Hurt, Purdue agricultural economist.

The field day marks a first for ACRE and Purdue's agricultural center system, said Jim Beaty, ACRE's superintendent and field day co-chairman.

"This is the first time we've had a major soybean field day at any of the Purdue farms," he said. "Historically, the farms have had broad field days with many different short topics. However, we feel our clientele is becoming much more information-intensive on the kind of information they want. We think this field day provides a lot of educational material of value in a short period of time."

Speakers represent the Purdue School of Agriculture departments of Agronomy, Agricultural Economics, Agricultural and Biological Engineering, Botany and Plant Pathology, and Entomology.

"We've got more than 20 Purdue specialists who will be here at some point in the day to give a presentation," Beaty said. "Some of the tours will run continuously all day, while others are of a general nature and may be offered once or twice during the day."

The bottom line: Arrive early and plan to stay the day, Beaty said.

"If they come at midmorning and expect to catch all 23 presentations, they simply won't have enough time," he said.

Continuing Education Credits are available for Certified Crop Advisors attending the event. Commercial applicators and producers can earn Continuing Certification Hours.

The Indiana Soybean Board is a field day sponsoring partner.

For additional information about the event, contact Christmas at (765) 494-6373, echristmas@purdue.edu; or Beaty at (765) 463-2632, jbeaty@purdue.edu.

A Soybean Field Day brochure can be downloaded online.

Agronomy

Soybeans are Showing Moisture Stress in Some Parts of Indiana - (*Ellsworth Christmas*) -

August has been very dry across much of Indiana with most of the state receiving less than an inch to date. Most of the soils in Indiana were near field capacity at the beginning of August and are only now starting to exhibit symptoms of moisture stress. The soybean crop in much of Indiana has reached the R5 growth stage with seed development within the pod. At the Agronomy Research Center, plots planted to a Group II variety on May 23 have developed to the point where moisture stresses will result in reduced seed size but no pod or seed abortion. Group III varieties planted on the same date could suffer some seed abortion, reduced seed size, but few if any pods will be aborted. Of the plots planted on June 6, the Group I and Group II varieties, under moisture stress, could have reduced seed size, but most likely will not suffer yield losses as a result of pod or seed abortion. However Group III varieties planted on June 6 could abort the pods at the top of the plant as well as seed in the upper one-third of the plant.

It depends on where you're located in the state as to soil moisture availability and the condition of the crop. The eastern part of Indiana has had between 1 and 2 inches of rain during August and the soybeans are showing very little moisture stress except in those areas that were missed by the rains. The western part of Indiana has received the least rainfall during August and the soybean crop is under the greatest stress.

We are not as desperate as last year, but some areas in Indian need of 2 to 3 inches of rain within the next week or so for the soybeans to resume normal growth. Soybeans, like corn, need an inch of rain per week during critical growing phases. The crop is not lost, but it is beginning to suffer yield losses from the lack of rain. Good rainfall in the next week will do wonders to stop the decline in the condition of the crop and prevent further yield losses. Only the very late planted and the double-crop soybeans have the ability to flower and set pods, but we need the rains rather quickly for that to occur. If we do have adequate rain for normal growth to resume, we're going to need the rain to carry through to at least the second week of September in the late planted areas. We normally say August, but with the late planting of this year's crop in southern Indiana, we need rain through the first two weeks of September to give us a reasonable yield.

Yield is determined by the number of pods for a given area, the number of seeds in those pods and the weight of the seed within the pod. Stresses at reproductive stages 3 and 4 can reduce the number of pods. Stresses at reproductive stages 5 and 6 can reduce the number of seeds within the pod, and also can reduce the size of the seed. If any one of those things occurs, it'll have a negative impact on the final yield.

Dry conditions are hurting soybeans in another way. Spider mite or aphid feeding places additional stress on the plant and can further reduce the yield potential. Heavy infestations of soybean cyst nematode will add additional stress to the plant by restricting the root system. Many times plants stressed by SCN will not only exhibit symptoms of moisture stress but also symptoms of potassium deficiency.

Sampling Form for Herbicide-Resistant Weed Confirmation – (*Jeff Barnes, Bill Johnson, and Glenn Nice*)

Herbicide-resistant weeds are not a new problem to Indiana producers. Redroot pigweed and lambsquarters were first reported resistant to atrazine in 1980. Since then several other weed species have tested positive for herbicide-resistance. The latest "superweed" that is causing problems for producers is marestail/horseweed that is resistant to glyphosate. Several sites in Southeast Indiana had marestail "escapes" in 2002 that have been confirmed as resistant by Purdue personnel or company representatives. True resistance to glyphosate has not been officially identified in other prevalent weed species in the Midwest such as waterhemp, common lambsquarters, common ragweed, and giant ragweed, but several fields have seen poor glyphosate performance on these weeds. In the case of giant ragweed, control failures have been loosely associated to stem tunneling by stalk boring insects.

A new sampling form for herbicide-resistance confirmation has been developed and is available on the following page and on the Purdue Weed Science website <www.btny.purdue.edu/weedscience/>. Seed samples can be submitted for confirmation of resistance as fields are identified in which herbicide-resistance is believed to be the cause of herbicide failure. This fall and early winter, the submitted seeds will be tested for resistance to the herbicide of interest. The results of these experiments will be turned back over to the person submitting the sample in a timely manner so that the producer can adjust herbicide programs in that particular field.

The sampling form contains several questions such as herbicide history that will provide essential information to us in diagnosing whether the problem-weed is truly resistant to a specific herbicide or was not controlled due to other reasons. In addition to the background information on the field, we would like to know specifics about field location. This will help to identify potential hot-spots which have high levels of resistance. In that scenario an alert will be submitted to county educators and retail agronomists alerting of the high potential of herbicide resistance and the corresponding need to address the issue in their weed control recommendations.

Weeds that are of particular interest are marestail/horseweed and giant ragweed, but if other weed species are identified as possibly resistant to herbicides, particularly glyphosate, please send those in as well. For most weeds the seeds are all that is need to test for herbicide resistance but in the case of giant ragweed please send whole plants or note whether there is evidence of tunneling in the stems of the plants.

Weeds can often be cantankerous and will produce seeds that are dormant and difficult to germinate in greenhouse trails which we will conduct to test for herbicide resistance. As a general rule the more seed we get the better. This will facilitate developing methods to obtain germination of the seeds if they do not readily germinate. Usually weeds produce seed over a relatively prolonged time-period. Generally, the best time to collect seeds is during the middle of reproductive or seed production growth. Based upon field observations, this would generally occur during mid-to late-September.

If you are in doubt about a particular field or weed concerning possible reasons for herbicide escape, please contact Jeff Barnes, Bill Johnson, or Glenn Nice, using the contact information below.

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www.btny.purdue.edu/weedscience/

PURDUE
Weed Science

Herbicide Resistant Weed Confirmation Sampling Form

Sample number: _____

Date Received: _____

(For Purdue use only)

Contact Information

Your Name: _____

Address: _____

City/State/Zip: _____

Phone numbers - work: _____ home: _____ fax: _____ cell: _____

E-mail: _____ Sample Reference: _____

Weed Species _____

Specify which herbicide the weed is believed to be resistant
_____

Field Information

County: _____

GPS location: _____

Field acreage: _____

Crop this year (2003): _____

Cropping history (last 5 years):

2002 _____
2001 _____
2000 _____
1999 _____
1998 _____

Tillage system (last five years):

2002 _____
2001 _____
2000 _____
1999 _____
1998 _____

Soil Type: _____

Herbicide Information

Herbicide program this year (2003):

_____
_____

Herbicide history for this field (last five years):

2002 _____
2001 _____
2000 _____
1999 _____
1998 _____

Herbicide applications (2003)

Spray volume (GPA): _____

Herbicide rate: full _____

or reduced _____

Any problems with the application? _____
_____

Weed size at application: _____(in)

Soil conditions: Wet _____
Normal _____
Dry _____

Weed Information

Distribution in field

Prevalent _____
Widely scattered _____
One dense clump _____
Many dense clumps _____

% of field infested _____

Has this weed been easy to control in the past?
Yes_____ NO_____

Has the weed progressively gotten harder to control?
Yes_____ NO_____

Were any symptoms noticed on the weed after herbicide application? _____
_____
_____

Sampling Procedures

1. Send either mature seeds or seedheads.
2. Collect seed or seedheads from 20 to 40 widely plants throughout the field.
3. Air dry seed/seedheads prior to packaging to prevent mold.
4. Label the package containing the seed or seedheads with the sample reference, name, and location.
5. Mail the samples and the survey form together to the address listed above.

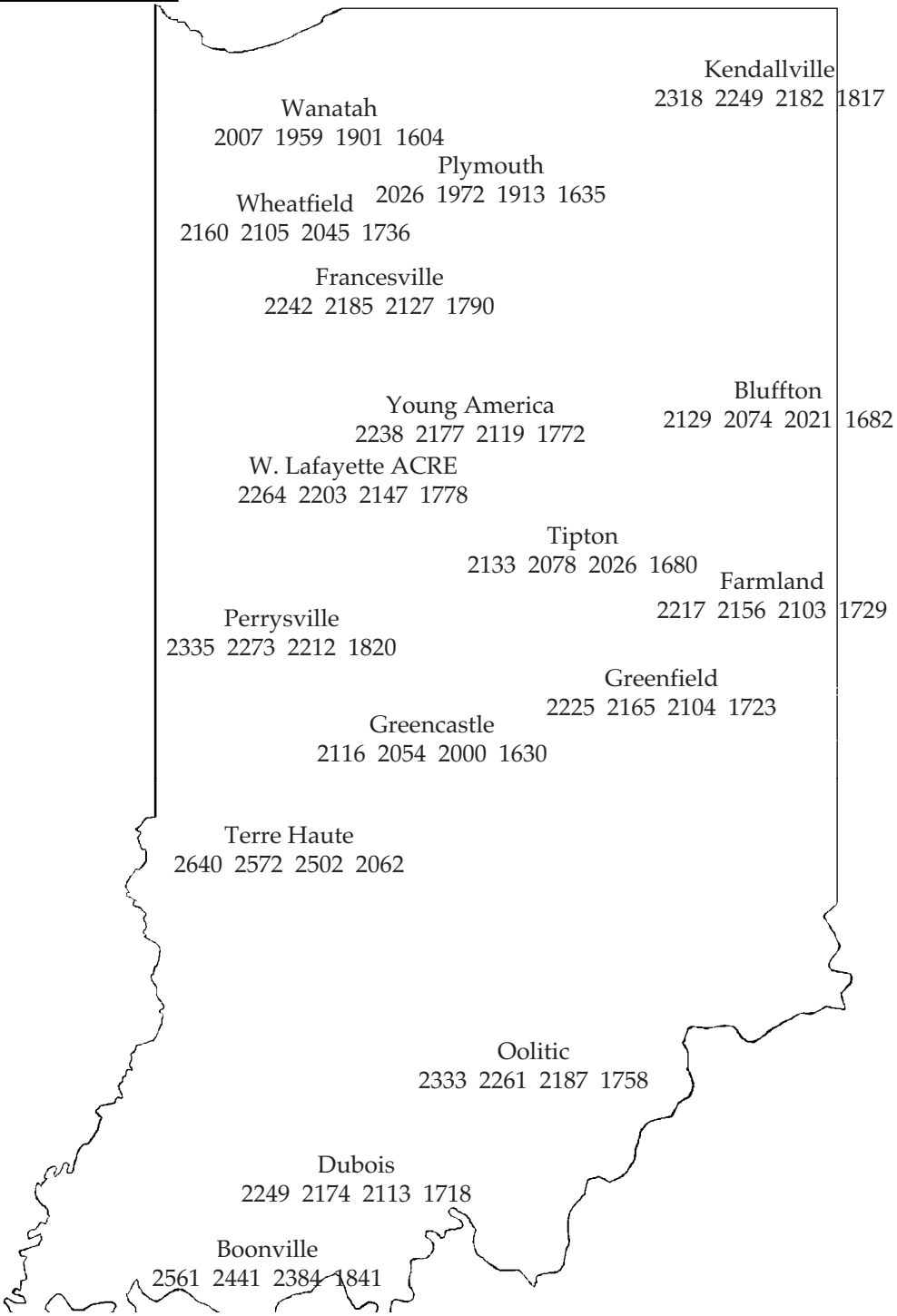
USE REVERSE SIDE FOR ANY ADDITIONAL INFORMATION REGARDING SAMPLE

Weather Update

Temperatures as of August 27, 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 8/27/03

Location	Max.	Min.
Wanatah	88	75
Columbia City	78	69
Winamac	81	76
Bluffton	78	77
W Laf Agro	90	78
Tipton	86	72
Farmland	87	70
Perrysville	80	73
Terre Haute	90	75
Oolitic	87	73

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