Pest & Crop

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

July 2, 2004 - No. 16

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Insects, Mites, and Nematodes

Silk and Pollen Snackers - (*John Obermeyer and Larry Bledsoe*)

- Monitor pollinating plants for silk damage
- Concentrate on silk length and amount of pollen yet to be shed
- Treatment after 50% pollination will not pay
- Delayed pollinating fields may attract higher beetle numbers

Rootworm and Japanese beetles continue to emerge throughout the state, although high numbers have not yet been reported. If beetles are present in commercial cornfields during pollination, control may be necessary if the silks are clipped off to within 1\2 inch or less of the tip of the ear before 50% pollination is completed. It has been suggested that 5 beetles per plant can result in the need for control, however, many fields have had higher numbers during pollination with little or no silk clipping activity. This is because the rootworm beetles prefer pollen to silks for a food source. So, don't judge the need for treatment based on beetle numbers.

Highest risk fields, or areas of fields, are those that have been delayed in growth from flooding or replanting and pollination will be later than surrounding fields. Beetles will flock to these pollen-laden plants and potentially interference with fertilization by severely clipping silks.

Research with inbreds in seed production fields has shown that 2 to 3 rootworm beetles per plant can

Western corn rootworm beetle feeding on pollen significantly reduce ear fill. For additional information on rootworm beetles see Extension Publication E-49-W, *Managing Corn Rootworms - 2004* (Rev. 1/04) at: <www.entm.purdue.edu/entomology/ext/targets/e-series/fieldcro.htm>.

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First Spider Mite Report Received - (*John Obermeyer and Larry Bledsoe*) –

- Spider mites may or may not be the cause of discolored soybean plants
- Rain indirectly helps slow or control spider mites
- Consider many factors before treating spider mites

While some fields in the state are still draining off the excess from gully-washers a couple weeks ago, some areas could use some moisture. This became evident when I received a call from Mark Evans, Owen County Extension Educator, about spider mites in soybean. He was alerted to the mites presence by the discoloration of the plants along the field edges. His question was, can treating of borders prevent damage throughout the field? Unfortunately, there's not an easy answer.

Before considering control, it is very important that spider mites are identified as the source of the problem. Shake some discolored soybean leaves over a white piece of paper. Watch for small dark specks moving about on the paper. Also look for minute webbing on the undersides of the discolored leaves. Once spider mites have been positively identified in the damaged areas of the field, it is essential that the whole field be scouted to determine the range of infestation. Sample in at least five different areas of the field and determine how far the spider mites have moved into the field from the grassy borders by using the "shake" method.

Stressed plants actually provide a better nutritional feast for spider mites thus they thrive and quickly colonize areas or whole fields. The best spider mite control is to eliminate plant stress, this easier said than done. Sandy or high clay soils will express moisture stress first in the plants, with or without the presence of spider mites. Other stresses on soybean include pests such as soybean cyst nematode or nutritional imbalances, such as manganese deficiency. Obviously the best plant stress reliever under dry conditions is rain.

Spider mite damage starting from the field edge

Rain indirectly controls spider mites. Pounding rains can physically beat spider mites off the plants where they meet their doom by drowning or to ground dwelling predators. More importantly, rains increase humidity that slows the spider mite reproduction and favors pathogenic fungi. Several days of relative humidity above 70% may induce an epizootic wiping out the spider mite population. On the other hand, warm temperatures and low humidity returning after rain may only delay the spider mite infestation. Above all else, significant rain helps the soybean crop to grow and provides less of a "protein broth" for the spider mites.

Reduction of crop yield is directly related to duration and intensity of the mite attack. The most severe damage occurs when the infestation starts in the early stages of plant growth and builds throughout the season (extended drought). Before applying controls carefully consider that, depending when damage is noted, multiple insecticide applications may be necessary. This is because surviving spider mites are able to repopulate a field faster than can the natural predators that are often prevalent in infested fields. If leaf discoloration is apparent, spider mites are positively identified as the culprit, and hot, dry conditions are expected to persist, it is recommended that a control be considered. Spot treatment 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 discolored plants. Spray a buffer zone of at least 200 feet beyond colonized plants.

If a control is warranted, two pesticides are recommended for use. These include dimethoate (Dimethoate 400 and 4 EC) and chlorpyrifos (Lorsban 4E). Proper placement of these pesticides is the key to successful control results. Nozzle pressures of 40 psi and 30-40 gallons of water per acre for ground application helps distribute the pesticide throughout the foliage. If using aerial application, the control material should be applied in 3-5 gallons of finished spray per acre. Normally, aerial applications are not as efficacious as ground applications due to limited surface-area coverage. So where possible, use ground application. Also, research has shown that mite controls work best in the early morning or evening hours. This is primarily due to more stable weather conditions, less convection currents and evaporation, resulting in better targeting of the pesticide.

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Soybean Aphid Update – (*John Obermeyer, Larry Bledsoe, and Bob O'Neil*)

We haven't given a soybean aphid update in several weeks; no news is good news! Purdue's soybean aphid researchers have found very low numbers of aphids in Cass, Miami, and Tippecanoe Counties. Pest managers throughout the state have reported looking for the soybean aphid and finding little to none. The elevated aphid numbers in Eastern Iowa several weeks ago apparently has subsided. It certainly is too early to write this pest off for the 2004 season, but suppressed aphids numbers and excellent soybean growth and development are certainly in our favor.

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FREE: Soybean Sweep Net Sampling! – (*John Obermeyer*)

In a couple weeks we will begin our sweep net sampling of soybean fields for the presence of the corn rootworm beetle. This helps us determine the spread and/or density of the variant western corn rootworm beetles throughout Indiana and assess the risk to next year's first-year corn.

We need soybean fields to sample, generally 2-3 fields per county separated by several miles. We especially are in need of field locations in southern and central counties. We will make every attempt to share field insect counts with you once completed early this fall.

If you are willing for us to sample your soybean fields, please contact me ASAP with specific locations (road intersections, GPS coordinates, marked plat book pages, etc) to:

John Obermeyer
obe@purdue.edu
FAX 765-494-2152
Phone 765-494-4563

We want your soybean field to sweep!

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Black Light Trap Catch Report - (John Obermeyer)

County/Cooperator	6/15/04 - 6/21/04							6/22/04 - 6/28/04						
	VC	BCW	ECB	SWCB	CEW	FAW	AW	VC	BCW	ECB	SWCB	CEW	FAW	AW
Dubois/SIPAC							3							8
Jennings/SEPAC			1				12			2				32
Knox/SWPAC			19		3		25			8		2		3
LaPorte/Pinney Ag Center		1	28				18			2				11
Lawrence/Feldun Ag Center					2		20							32
Randolph/Davis Ag Center			7				25		6	2				36
Tippecanoe/TPAC Ag Center														
Vermillion/Hutson														
Whitley/NEPAC									2	6				326

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

Weeds

Weed Control Timing Issues in Roundup Ready Soybeans – (*Bill Johnson, Glenn Nice, and Tom Bauman*)

Postemergence weed control operations in soybean should be well underway in most of Indiana. With over 85% of our soybean acres planted to Roundup Ready soybean, we have seen the use of postemergence weed control products shift from photosynthetic inhibitors (Basagran), diphenylethers (Cobra, Blazer/Status, Reflex/Flexstar) and ALS inhibitors (Scepter, Pursuit, Classic, Synchrony, etc.) to glyphosate-based products. Although we are shifting use patterns, we must still use sound judgment in selection of controllable spray application variables.

As with most herbicides, the labels of glyphosate-based products contain information designed to maximize the efficacy of this product on target weeds. With contact herbicides such as diphenylethers and photosynthetic inhibitors, we typically recommended spraying weeds when they were small (3 inches or less) and using higher pressure (psi) and spray volume (gpa) to ensure thorough coverage. This is done since foliage that is not contacted by these herbicides will not be effectively controlled. Since the glyphosate (Roundup) products are translocated to active sites in the plant, complete foliage coverage is less important, and success with lower spray volumes has been achieved on a regular basis in the scientific literature and in the real world.

Obviously, weed management strategies have shifted with the use of the Roundup Ready technology. Before Roundup Ready soybean, weed control programs consisted of utilizing either 1) soil-applied herbicides plus early-post (weeds less than 3 inches tall) treatments for broadleaves and/or mid-post (weeds 3 to 6 inches tall) treatments for grasses or 2) utilizing total-post programs targeted at a mid-post application timing.

Broad adaptation of the Roundup Ready soybean system has resulted in a shift in weed management philosophy. Most glyphosate labels state that the "best" results will be obtained with a 1-quart application (or 22 oz./A of Roundup Weathermax) on 4 to 8 inch-tall weeds, with sequential applications as needed. While we feel that as a general rule, this strategy will be successful, it will be tempting to push the technology envelope and allow weeds to get larger than 8 inches before the first application is made. For that reason, we would suggest targeting the first application to 4 to 6 inch-tall weeds, regardless if one is in a total-post system or a soil-applied followed by post system, and make sequential applications as needed. This strategy will help reduce early season weed competition and result in fewer nonperformance issues.

VC stage soybean and big giant ragweed. Although these weeds have just been sprayed (see yellowing in terminals), the timing of this spray application was a bit off in our estimation. We recommend against using this strategy. Photo was taken in 2003 in Indiana by Dr. Bob Nielsen, Department of Agronomy. The name and location of the area are not given to protect the innocent.

Unfortunately, my observations are that we are pushing the limits of the technology by making the first glyphosate application on weeds 8 to 16 inches tall (or taller – see photo). In discussing this with growers and consultants, it appears that the mindset is to make the application as close to crop canopy as possible to take advantage of the crop canopy in suppressing additional weed regrowth. When the herbicide is effective at controlling the large weeds, these programs have resulted in very clean fields. However, a clean field in August doesn't mean that it will yield as high as it could have if the weeds had been controlled in a more timely manner early in the season. Our research has repeatedly shown that in a total postemergence Roundup Ready soybean system with moderate to heavy weed infestations, an initial weed control operation must be done according to one of the three criteria to minimize yield losses due to weed competition. These criteria consist of either 1) controlling weeds by 4 to 5 weeks after planting, 2) controlling weeds before they reach 6 to 9 inches in height, or 3) controlling weeds before soybean reaches the V3 stage of growth. Environmental conditions and weed densities and variety can slightly shift optimal management times in either direction for any of the criteria, but using one of these as a general rule of thumb will be the best way to minimize risk of yield loss.

Soybean Sudden Death Syndrome – (*Andreas Westphal, Scott Abney, and Gregory Shaner*)

• Heavy rains favor early infection by the SDS pathogen

Sudden death syndrome has been a problem in many Indiana soybean fields in recent years. Since the disease was first identified in the southwest corner of Indiana in the mid 1980s, it has spread to affect fields in nearly all of the state. The distribution of past outbreaks suggests that the disease may show up in virtually any area of Indiana, when conditions are favorable.

Sudden death syndrome is caused by the soil-borne fungus *Fusarium virguliforme* (previously known as *Fusarium solani* f. sp. *glycines*). This name change reflects current thinking that the SDS-causing fungus in North America is distinct from fungi that cause SDS in South America.

The SDS-pathogen can be isolated from roots of soybean seedlings as early as 1 week after shoots emerge. The fungus colonizes the root systems of susceptible plants. While the fungus can colonize soybean root tissue early on, it is only at mid-season and thereafter that aboveground symptoms of SDS occur. Leaf symptoms usually do not appear until pods are starting to develop, any time from mid July through mid August. Heavy rains during reproductive stages seem to be a critical predisposing factor for SDS. Under these conditions the fungus starts producing toxins in the root system that are translocated within the plant and lead to foliar symptoms.

In affected plants, leaf tissue between the major veins turns yellow, then brown. Soon, the leaflets die and shrivel. In severe cases they drop off, leaving the petioles (leaf stalks) attached. Brown stem rot may cause similar foliar symptoms, but the leaflets tend to remain attached to the petioles. Brown stem rot can be distinguished from SDS by symptoms in the plant stem. When split, the lower stem and taproot of a plant with SDS will exhibit a dark cortex, but white pith. Brown stem rot darkens the pith, but the cortex is not much discolored. If a plant with symptoms of SDS is dug up when soil is moist, there may be small, light-blue patches on the surface of the taproot. These are spore masses of the SDS fungus. As the plant dries, this color will fade, but when it is seen, in conjunction with the other symptoms mentioned above, a diagnosis of SDS is strongly indicated.

Early planting into cool soils favors SDS. Soybean planting this spring progressed ahead of average. Many of these early-planted fields have been very wet in recent weeks. Wet soils, particularly as plants begin flowering, are conducive for SDS. Plants with symptoms of SDS have already been received by the Plant and Pest Diagnostic Lab at Purdue. This is about one month earlier than last year. It is not possible yet to predict how severe or widespread SDS will be this year. If conditions remain wet we may expect to see a lot more SDS. If it turns dry (as it did in 2003) SDS may not be a problem. The strong environmental impact on symptom expression makes prediction difficult.

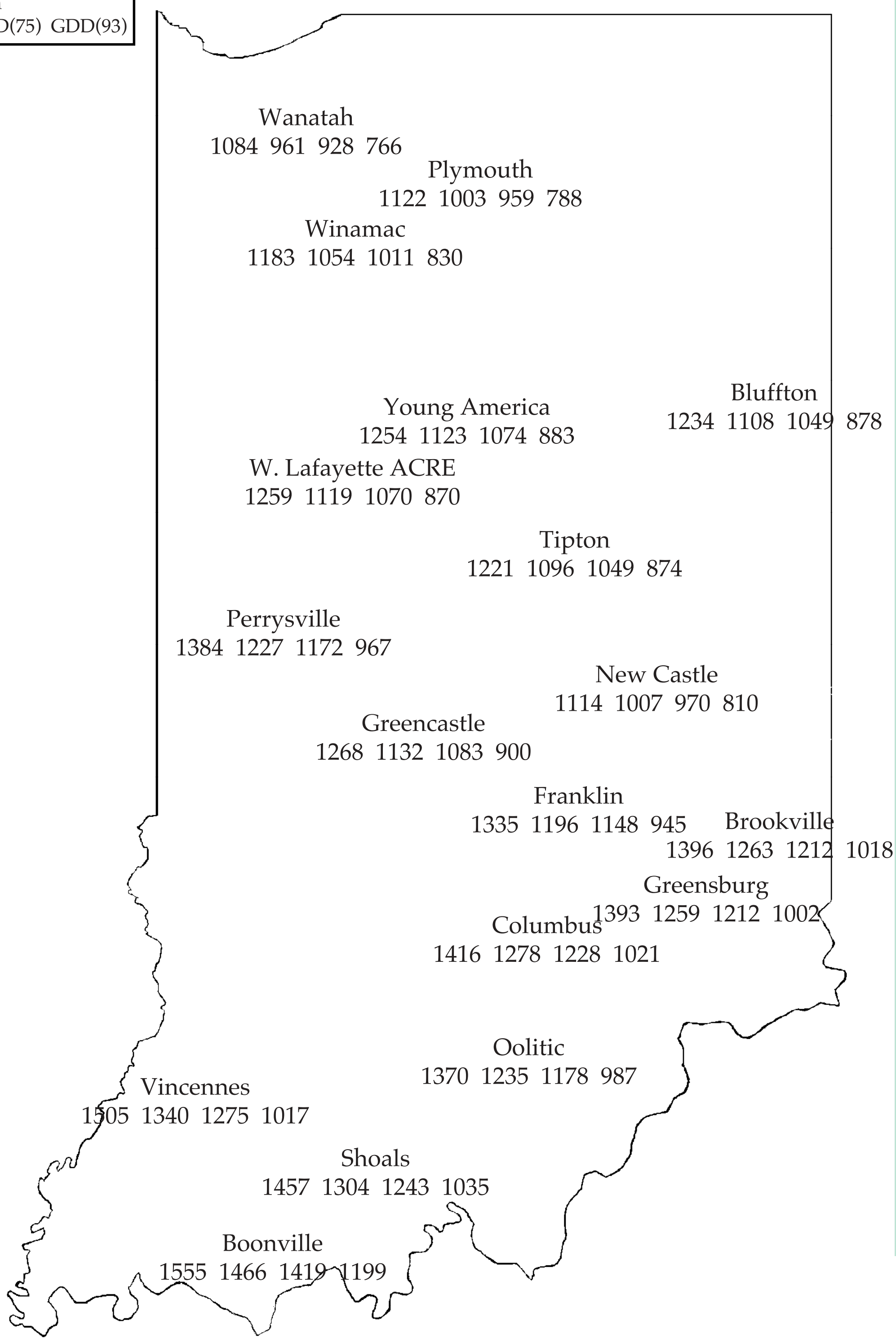
Certain cultural practices can reduce the risk of SDS. For example, a grower can choose a soybean cultivar that is less susceptible to SDS. Late planting is thought to reduce the risk for SDS. It is always good practice to keep field records of soil-borne diseases. Fields severely impacted with SDS in 2004 should be earmarked for later planting when they are scheduled for soybean planting in the future. Resistance cultivars should be planted in these fields.

Weather Update

Temperatures as of June 30, 2004

GDD(5) = Growing Degree Days from April 7 (5% of Indiana's corn planted), for corn growth and development
GDD(42) = Growing Degree Days from April 21 (42% of Indiana's corn planted), for corn growth and development
GDD(75) = Growing Degree Days from April 30 (75% of Indiana's corn planted), for corn growth and development
GDD(93) = Growing Degree Days from May 14 (93% of Indiana's corn planted), for corn growth and development

MAP KEY
Location
GDD(5) GDD(42) GDD(75) GDD(93)



4" Bare Soil Temperatures 6/30/04

Location	Max.	Min.
Wanatah	87	63
Winamac	83	63
Bluffton	68	64
Chalmers	71	68
W Laf Acre	86	65
Tipton	83	65
Farmland	76	64
Perrysville	78	71
Crawfordsville	83	68
Liberty	86	63
Dubois	91	68