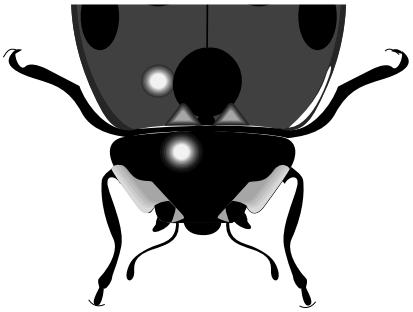

PEST MANAGEMENT & CROP DEVELOPMENT

BULLETIN

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Also in This Issue

Last Seasonal Issue of the Bulletin for 2003

This issue of the 2003 *Bulletin* is the last one that will be published before September. Issue numbers 22, 23, 24, and 25 will be published on September 5, October 3, November 7, and December 5, respectively. However, if necessary, we will provide updates to the Web version of the *Bulletin*, so keep watching for breaking news.

The authors who write articles for the *Bulletin* have a lot of help during the season. Your reports from the field are invaluable, and we thank you for your willingness to help support our efforts. Thanks also to all of the readers who continue to show support for our efforts by either subscribing to the printed version of the *Bulletin* or logging onto our Web site. On behalf of the other authors who contributed to this *Bulletin*, I thank you for your support this year.

I also want to thank Molly Bentsen, Mary Overmier, and Erin Cler, the editors who work so diligently every week to correct our editorial deficiencies, and to Mike Greifenkamp, who prepares the copy for the Web. They all do a great job getting the information together in a timely fashion and in a readable format. Thanks much to all of you.—*Kevin Steffey*

Workshop to Focus on Field Crop Disease Management

Producers, agribusiness dealers, and crop scouts are invited to participate in a "Field Crop Disease Management" workshop on August 26. The workshop will be conducted at the Crops Training Center at the Northern Illinois Agronomy Research Center, 14509 University Road, Shabbona, and is sponsored by University of Illinois Extension.

The workshop will focus on disease and nematode management issues for corn and soybean in northern Illinois, including a review of diseases that have occurred this season plus those projected to be a problem. Lecture-style presentations will be combined with hands-on demonstrations of diseased plants and short field-tour demonstrations. Drs. Dean Malvick and Terry Niblack, Extension plant pathologists, will lead the discussion. Five IPM continuing education units will be provided to certified crop advisers.

Registration begins at 8:30 a.m., and the workshop will be conducted from 9:00 a.m. to 3:00 p.m. The cost is $50 per person; reservations are due by August 18 to the Quad Cities Extension Center, c/o Dave Feltes, 4550 Kennedy Drive, Suite 2, East Moline, IL 61244; telephone, (309)792-2500. Make checks payable to University of Illinois Extension. A minimum of 20 reservations is needed to conduct the workshop.

INSECTS

Problems with Soybean Aphids South of I-80

By now, everyone probably is aware of the heavy infestations of soybean aphids that have occurred in Illinois north of I-80. As a consequence of the heavy infestations, many winged aphids have been produced, and they have

been flying around quite a bit. Check out the most recent counts from the Illinois Suction Trap Network at http://www.ipm.uiuc.edu/fieldcrops/insects/soybean_aphids/suction_trap_network/index.html. Most of us would agree that a week's capture of 6,755 soybean aphids, in the trap near DeKalb, is notable. The numbers of aphids captured in some of the other traps also have increased, although not quite so dramatically.

During the week of August 4, we began to receive many reports of rather heavy infestations of soybean aphids in counties south of I-80, primarily Champaign, Ford, Kankakee, Iroquois, and Livingston counties on the eastern side of the state. However, we also have received reports of winged aphids in soybean fields in Adams, Brown, Fulton, Hancock, Henderson, Knox, McDonough, Mercer, Peoria, Pike, Schuyler, Stark, and Warren counties on the western side of the state. The numbers have been small in most fields, but they bear watching. In addition, numbers of soybean aphids in southern counties have begun to increase. Following is information about some fields surveyed by Dr. David Voegtlin's crew on August 7. I provide the percentage of plants infested (only 10 plants checked) and the average number of aphids per infested plant:

- Bond County: Field 1—100%, 11; Field 2—100%, 26.9
- Clay County: Field 1—40%, 1; Field 2—50%, 4.1
- Clinton County: Field 1—90%, 15.6; Field 2—100%, 53.6
- Effingham County: Field 1—60%, 1.1; Field 2—100%, 19.3
- Fayette County: Field 1—40%, 2; Field 2—90%, 8.4; Field 3—90%, 45.1
- Marion County: Field 1—100%, 16.6; Field 2—100%, 14.3
- Richland County: Field 1—60%, 11.7; Field 2—0%

Although the numbers are not particularly alarming, they are worth noting as benchmarks for the area. It's possible that the numbers of aphids could increase very quickly in these counties, so monitoring should begin immediately. Other notes from these southern Illinois fields:

- The plants ranged from growth stages V6 to V9.
- Alates (winged adults) were present in most fields, indicating that the aphids recently had immigrated into the field.
- Few natural enemies were noted.

Most of the questions I recently have received from several individuals have been similar, so I am providing the answers I have given to these questions. Please don't hesitate to contact me if you have additional questions or want to provide a report from your area.

What is the economic threshold for soybean aphids infesting soybean fields? Our monitoring guidelines and economic threshold are explained in the "Soybean Aphid" fact sheet at http://www.ipm.uiuc.edu/fieldcrops/insects/soybean_aphids/nsrl_4.pdf. Basically, we have used an average of 25 aphids per middle leaflet (remember, there are three leaflets per trifoliate) as an economic threshold, with caveats regarding the presence of alatoid nymphs and natural enemies. However, when the aphids are distributed on stems and pods as well as leaves, a per-leaflet threshold may not be as useful. So we have checked with entomologists at the University of Minnesota, who have had more consistent experience with soybean aphids. We are recommending their threshold of an average of 250 or more soybean aphids per plant.

What insecticides can be used to control soybean aphids? The insecticides suggested for control of soybean aphids are *Asana XL at 5.9 to 9.6 ounces per acre, *Furadan 4F at 1/2 pint per acre, *Lorsban 4E at 1 to 2 pints per acre, *Mustang Max at 2.8 to 4 ounces per acre, *Penncap-M at 1 to 3 pints per acre, and *Warrior at 1.92 to 3.2 ounces per acre. Use of products preceded by an asterisk is restricted to certified applicators. Also, please note that insecticides should not be applied at a time when bees are actively visiting flowering soybeans.

What insecticides are most effective against soybean aphids, and which ones provide the longest residual control? Data from our efficacy trials in 2001 and 2002 suggest that all of the products previously listed are effective against soybean aphids for as long as 14 days. Entomologists at the University of Minnesota have stated that the pyrethroids have provided the longest residual control. However, our data indicate that the organophosphates and carbamates have provided the same residual control as the pyrethroids.

Which is more effective, aerial or ground application? The concern seems to be coverage related to gallons per acre. However, the experience we have had thus far indicates that aerial applicators are doing a good job getting the insecticides to the aphids. We have no evidence to suggest that one type of application is better than another.

We will continue to provide updates as we learn more over the next couple of weeks. Your help with reports from the field will enhance our information. Thanks for your cooperation and support thus far.—*Kevin Steffey*

Some More Information About Soybean Aphids

The preceding article was written as an update between issues no. 20 and 21 (August 8 and 15, 2003, respectively), but it appeared only on the Web site. As a matter of policy, we include update articles in the next printed issue. However, even more has happened with soybean aphids since the update was posted to the Web site on Monday, August 11, so following is a little more information about this troublesome pest.

Apparently economic numbers of soybean aphids are being discovered in areas where they have not been noticed up to now. Numbers of soybean aphids have increased rather significantly in Fulton, Henry, Knox, McLean, Stark, Whiteside, and Woodford counties in north-central and northwestern Illinois. We also are receiving reports of significant infestations from some more central Illinois counties such as Logan and Sangamon. If your county is not listed among these, don't assume that soybean aphids are not present. I have listed only those counties for which we have received good reports. So, if you have not begun to do so already, scout, and then scout some more. It's very important to determine whether soybean aphid densities are increasing or decreasing. At some point soon, densities of soybean aphids should begin to decline naturally as the time approaches for the generation that flies back to buckthorn.

The primary question being asked about soybean aphid management right now focuses on thresholds. It's no secret that thresholds among midwestern states vary, primarily because entomologists still have not had much time to conduct the research necessary for developing thresholds. However, the information available provides the best current information. I just finished reading an excellent article written by Eileen Cullen, Extension entomologist at the University of Wisconsin. In her article, she discusses thresholds in a very objective way. She mentions results from 16 economic threshold and spray-timing studies conducted by entomologists at the University of Wisconsin. They determined that thresholds vary with the growth stages of the soybean plants—200+ aphids per plant at full bloom (R2), 1,000+ aphids per plant at beginning pod (R3), and 1,500+ aphids per plant at full pod (R4). You can read the entire article in the August 7, 2003, issue of *Wisconsin Crop Manager* at http://ipcm.wisc.edu/wcm/pdfs/2003/wcm03-20.pdf.

With all of the research being conducted on soybean aphids this year throughout the Midwest, I have confidence that we will know more about this pest as we go into the 2004 season than we did coming into the 2003 season. We'll never have the answer to all of the questions, but we'll know more soon.—*Kevin Steffey*

Controlling Western Corn Rootworms in Soybeans: Confusion?

I recently was told by someone that the University of Illinois's recommendation regarding controlling western corn rootworm adults in soybeans to prevent egg laying was confusing. Please allow me to clear up the confusion: *We do not recommend this practice; in fact, we strongly discourage it.* I hope this clarifies our position.

It has come to my attention that some "consultants" (I use quotation marks because some of the consultants are pesticide manufacturing company salesmen) are recommending that producers should control western corn rootworm adults in soybeans to prevent them from laying eggs, thereby protecting the corn crop that will be planted next year. However, they also are recommending that the producers use a soil insecticide (granule, liquid, or seed treatment) next year, just in case. That's quite an insurance policy. By using a soil insecticide on corn the next year, there is no way to know whether the insecticide spray to prevent egg laying did any good or not unless the producer leaves an untreated check.

Most of you realize that controlling western corn rootworm adults in corn to prevent egg laying can protect the corn crop the following year. In fact, we have included this management alternative for corn rootworms in our recommendations for several years. (Read "Managing Corn Rootworms," pages 2 to 5 [particularly page 3] in the *2003 Illinois Agricultural Pest Management Handbook* [http://www.ipm.uiuc.edu/pubs/iapmh/01chapter.pdf] for more information.) This practice works because a threshold has been established, timing is understood, and a scouting protocol exists. And if everything is done correctly, no soil insecticide is necessary to protect the corn roots the following year. Prevention of egg laying by rootworm adults is intended to be an alternative management practice, not a supplement to larval control. The information needed to develop a procedure that prevents significant egg laying by rootworm adults was developed over a relatively long period by a large group of university and industry entomologists. The same type of research needs to be conducted in soybeans, with corn planted the following year, before we could recommend controlling corn rootworm adults in soybeans to prevent egg laying. Thus far, this type of research has not been conducted.

One threshold being used (by "consultants") for recommending insecticides to prevent western corn rootworm adults in soybeans to prevent egg laying is 0.2 to 0.3 adult per sweep of a 15-inch diameter sweep net. Interesting. I have yet to learn where that threshold came from. In addition, I am curious about timing of such insecticide applications. According to Joe Spencer, research entomologist at the Illinois Natural History Survey, western corn rootworm adults fly back and forth from cornfields and soybean fields for a relatively long period. Consequently, timing an insecticide application to prevent peak egg laying is guesswork at best.

I have been told that there are data to support insecticide applications to control western corn rootworm adults in soybeans to prevent egg laying. However, I have not seen these data. Therefore, I invite anyone who has such data to share them with me. I am willing to examine the data objectively and would be very interested in learning whether this alternative for rootworm management has any validity.

One final word of caution. The practice of controlling western corn rootworm adults in soybeans one year and then controlling the larvae in corn the following year is loaded with risk. This practice places a lot of selection pressure on the rootworm population, and

the end result (the possibility for development of insecticide resistance) would leave many producers with few viable alternatives. So think about this before you make the decision to control adults in soybeans one year and then control larvae in corn the following year. Corn rootworms have adapted to every type of selection pressure we have placed on them (including crop rotation), so there's plenty of reason to believe they will continue to adapt.—*Kevin Steffey*

Another Soybean Defoliator

Dave Feltes, Extension educator in IPM at the Quad Cities Extension Center, has indicated a large number of painted lady butterflies in ditches and roadsides in northwestern Illinois. Although these beautiful insects fascinate the butterfly enthusiast, they may be a problem for the local soybean grower. The painted lady butterfly is the adult stage of the thistle caterpillar, which can be a problem in area soybean fields. Though predominantly brown, the wings of the painted lady are red and orange with black and white spots. The larvae of the butterfly are not exactly pretty but are striking in their own way. The larvae are about 1-1/4 to 1-1/2 inches long when fully grown. Their bodies are brown to black with a yellow stripe running on each side of the body. However, they have a thornlike appearance from the spiny hairs that cover the caterpillar.

Although the painted lady is one of the most common butterflies in the world, it does not overwinter in Illinois. It migrates from southern states each spring from more tropical areas. Adults lay eggs on hosts, and larvae hatch in about a week. The larvae, the thistle caterpillars, feed on more than 100 species of plants, including Canada thistle, sunflower, and many garden vegetables. When populations are high, they may be an economic pest of soybean. They are classified as defoliators of soybean leaves, but they also cause the leaves to web together. This is extremely important in early stages of soybean development. Thistle caterpillars experience two generations in Illinois. As we move into the last weeks of August, those beautiful butterflies we are seeing along the road are actually laying eggs for a second generation of thistle caterpillars. When looking in soybean fields for insect defoliation, keep an eye out for these spiny little caterpillars.

Also concerning defoliation, grasshoppers are being noticed in fairly large numbers across the state. Keep an eye out for high numbers and heavy defoliation in your area. Please refer to an earlier article on grasshoppers that appeared in the *Bulletin* (issue no. 10, May 30, 2003, http://www.ag.uiuc.edu/cespubs/pest/articles/v200316.html) for more information.—*Kelly Cook*

CROP DEVELOPMENT

Nitrogen Carryover

Severe storms in some areas of the state have resulted in crop damage that will markedly restrict potential yield of corn and soybeans. Questions have been raised about the potential for nitrogen carryover from fields that have reduced corn yield. The rough guideline for calculating this carryover is to subtract the yield of corn from the current year's nitrogen application, and divide the answer by 2, as in the following equation.

(N applied for 2003 crop year – corn yield in bushels per acre)/2

If yield loss was from hail damage, this will likely provide a good estimate of carryover, particularly if you will be growing wheat next year. If corn will be grown in the field, the carryover will be realistic, assuming that excessive rain is not received next spring. If excessive rain is received, then denitrification or leaching will reduce this carryover figure.—*Robert G. Hoeft*

"Unusual" Inputs for Soybean: Why Now?

We have heard over the past several weeks many reports of "unusual" inputs that are being promoted and sold for soybean. Such products are also sold for wheat and corn and other crops, but soybean is a more likely crop for which such products can be sold because soybeans are on so many acres, new problems such as aphids show up to generate uncertainty, growth or color problems are visible, and Roundup is already being applied during the summer.

For decades, companies have sold products with claims of benefits to crops beyond what "conventional" inputs such as crop nutrients and pesticides provide. Few of these products have lasted for many years; but new ones continue to appear, and in many cases they are closely related to or identical to products that have had a "run" in the past and then faded out. These are clearly profitable products: They are often quite dilute, they may be by-products from manufacturing processes, and claims are for only beneficial effects that are rather vaguely described and so are difficult to disprove. These products, almost by definition, do not invite lawsuits over either performance or crop injury.

We (university people) are known for our opposition to the sale and use of such products, because we often seem to have a knee-jerk reaction in stating that such products are "unproven." In part this is true; such products are almost always unproven, at least from the standpoint of having had enough careful research done to show that the product can be expected to provide a solid return on investment. On the other hand, we try to keep informed about such products and would like nothing better than to find ones that actually do provide a return on investment and that we could use as a means to generate interest and profits among producers. I *want* Illinois crop producers to gain. But some university

people who thought they had found such products in the past were badly burned when thorough research and farmer experience showed that (despite what might have been good theoretical underpinnings to support use of the product) it simply didn't worked well or consistently in the field.

Many of these products do have some theoretical basis to support their use. Plants need micronutrients, so why not put together mixes (the "multivitamin" approach) to provide whatever they might need? Soybean plants do sometimes grow tall and shade themselves or lodge—why not use a growth regulator to shorten them? Why not use a material to cut down on water loss so that plants can do better under dry conditions? Why not help "condition" heavy soils? Millions of dollars have been spent by companies trying to discover and develop such products, only to find that—once they are moved from the lab or even the greenhouse, where they work well, to the field—natural conditions mask their effects or even cause them to sometimes lower yields.

An even more common occurrence is that a product produces the desired effects sometimes but not very often, or that it produces yield increases sometimes and yield decreases sometimes, such that the expected effect is neutral or barely positive. Micronutrients that provide a positive response on a low-organic matter or low-pH soil will often provide no response on a more fertile soil with a neutral pH. This is understandable, but it's frustrating. A "reasonable" product may or may not pay off; and in some cases, it is difficult to predict where the response will be positive, such that the product can be applied only there.

If an input is relatively low cost (let's use 1% of gross crop value—$3 to $4 per acre—as an arbitrary threshold for "low cost"), then some farmers might use it as "insurance," not needing or even expecting it to pay off every time but gaining large increases in income when it's needed. Even products like these should have some pencil pushing to decide whether to use them. Take the expected percentage of time you expect the input to provide a return times the return (in crop value) when there is a response, and see whether this exceeds the average cost per acre of using the product. As an example, a product that returns $25 per acre in added income once in 5 years is an economically viable "insurance" input only if it costs less than $5 per acre, including application costs. Extra time spent to apply such inputs should be included, probably at a fairly high rate per hour, given that it will sometimes delay planting.

Inputs used as insurance reasonably should be expected to do something specific (provide disease protection, for example) and to work as advertised. What about products that are sold without an indication of what they do but that they simply "boost yields" or "improve growth" or something similar? As I mentioned previously, the companies producing these products have the real marketplace advantage in not having to provide specifics to say that the products did anything at all. These products almost never produce specific, visible effects in plants; nor do the companies producing them claim that they do, making them immune from claims that their products caused harm. Another advantage: It is virtually impossible to do definitive research to conclude that such products do *not* work. Indeed, it is possible that most products like this, unless they are completely inert (and some may be), do sometimes provide a response.

In general, sales of such products are supported heavily by testimonials. If university researchers have conducted careful research on such products, the fact that this happened may be part of the advertising; but results are often not specifically mentioned. It is fair to say that most neutral research on such products has failed to show a consistent response. We cannot, however, conclude from this that the product *doesn't work*—only that the particular set of trials we conducted failed to show a response or, at least, a consistent response.

What should the consumer of such products make of this situation? That depends largely on individual approaches to risk and to individual willingness to try new things. Many, perhaps most, producers "try" some unconventional products in their fields at least occasionally. This cautious "trying" is a good thing; but if the product is simply applied to a whole field or to a chunk of a field and then yields are compared to another field or to the other half of that field, we can't be certain that any yield change was caused by the input. The two halves of a uniformly treated field almost always yield differently. It is much more effective to make six or eight strips in the field with the new product, and to have the new product be the only thing different from "untreated" strips. Strips can alternate or be randomly assigned, but it is important to have both treated and untreated strips intermingled in the same part of a field.

There is even more power in testing the same product in a number of fields and having a number of neighbors participate, with the results then averaged over all test fields. Statistics can be run to tell us how confident we can be about the results; but even without statistics, a well-organized test can give us much better information than "selected" side-by-side comparisons that we often see in advertisements. Above all, we need to approach the use of unconventional products with an open, but healthily skeptical, mind.—*Emerson Nafziger*

REGIONAL REPORTS

Extension center educators, unit educators, and unit assistants in northern, west-central, east-central, and southern Illinois prepare regional reports to provide more localized insight into pest situations and crop conditions in Illinois. The reports will keep you up to date on situations in field and for-

age crops as they develop throughout the season. The regions have been defined broadly to include the agricultural statistics districts as designated by the Illinois Agricultural Statistics Service, with slight modifications:

- North (Northwest and Northeast districts, plus Stark and Marshall counties)
- West-central (West and West Southwest districts, and Peoria, Woodford, Tazewell, Mason, Menard, and Logan counties from the Central district)
- East-central (East and East Southeast districts [except Marion, Clay, Richland, and Lawrence counties], McLean, DeWitt, and Macon counties from the Central district)
- South (Southwest and Southeast districts, and Marion, Clay, Richland, and Lawrence counties from the East Southeast district)

We hope these reports will provide additional benefits for staying current as the season progresses.

Northern Illinois

Moderate temperatures continue throughout the area, which has been the case for weeks. Rainfall would be welcome, as precipitation as been very spotty during the past 3 weeks.

Insecticide treatments for soybean aphid infestations have increased throughout the region. Insecticide treatments have become more frequent in several areas beginning August 7 and 8. Growers are reminded to check insecticide product labels of the products being used, as preharvest intervals range from 21 days to 45 days. A few reports have been received of soybean sudden death syndrome being observed in Will, Kendall, and LaSalle counties.

West-Central Illinois

Rainfall has been adequate in many places, but more precipitation would be welcome to improve grain fill, especially in the northeast portion of the region.

The corn crop continues to look impressive in most parts of the region, with the exception of a few isolated areas where previous storms caused some substantial wind and hail damage. Significant flights of second-generation European corn borer have been observed in Brown and Schuyler counties, but reports of finding egg masses and larvae are few and far between. Many stalk and ear rots are becoming evident in a number of fields.

Soybean aphid populations continue to grow, particularly in the eastern (Sangamon and Menard counties) and northern (Hancock, Warren, and McDonough counties) part of the region. Producers are encouraged to scout and monitor their fields and manage accordingly. Soybean diseases have yet to become widespread and problematic, but there have been some instances of sudden death syndrome in a number of fields in the central part of the region.

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