

A Buggy Issue

Extension Entomologist Focuses On Keeping Soybeans Free Of Pests

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Several different soybean pests claimed the attention of Dr. Douglas Jones, University of Illinois Extension Entomologist/Integrated Pest Management Specialist, at a recent meeting.

Beginning with the Japanese beetle, he cited damage threshold research on soybeans. This work was funded by Illinois Soybean Association checkoff funds.

"This is two years worth of work so far," he said. "We're looking at establishing new thresholds based on number of beetles per plant to determine when we need to make treatments for Japanese beetle in soybeans."

Japanese beetle is not a primary pest of soybeans, it is a secondary pest that in the last 10 years has possibly become a major player. Some of the things learned to this point is that it doesn't matter whether you have one, three, five or 10 beetles per plant. There is a significant yield loss.

"Some of the studies I did this past year confirm that to a point, however the results weren't significant the second year," Jones said. "One thing I learned when I went back and looked at the data, is that there were bigger losses on the soybeans that were attacked by Japanese beetles earlier in their developmental period. The first year that we did the work, we thought we released the beetles at V3 through V5 developmental stage of the soybeans. The second year when I went back and double checked it was actually V5 to R1 when we released them. We had the same pattern but it wasn't as significant. Then also the yields the second year weren't near as high as the first year. Last year we averaged about 41 to 45 bushels per acre for the field without beetles, whereas the previous year we averaged 61 through 65. So that may have something to do with it also."

The experiment this coming year will be the same type, however it will focus on the timing of Japanese Beetle infestation. It's a cage study to look at the whole gamut from seedling all the way up through R2 stage as to when they were initially infested.

"The idea here is that once it gets to V5 it may not be so important anymore. It may be it's only at the early stages," he reasoned. "That part we don't know for sure yet."

Jones also discussed soybean aphids. This past year there was a massive outbreak of soybean aphids in southern Illinois. Conventional wisdom says soybean aphids do not cause problems in southern Illinois. However, Jones' discussion centered on soybean aphid life cycles which is a heteroecious homocyclic life cycle.

"Short answer to explain what that is: It is really odd," he said. "They reproduce asexually most of their life cycle, meaning without sex. There are only females, but then in the fall they create a sexual generation where there are males and females that mate and lay eggs. Before that they don't lay eggs. They also have two host plants. The primary host is buckthorn, an invasive shrub from the China region where soybean aphids originated in the first place. The secondary host is soybeans. They overwinter on the buckthorn."

Buckthorn is really common in the corn and soybean growing regions. Soybean aphids were a problem in Southern Illinois and surrounding regions, mostly because of the temperature. It just didn't get very hot last summer and their lifestyle requires an optimal 80 degree temperature.

"Once it gets over 95 temperature becomes lethal," he explained. "So when we have that two weeks in August where the temperature gets up over 100 that's making sure you don't have soybean aphids. Further north it doesn't get that hot and they weather through that and create the losses. Primarily you'll find them north of Peoria, closer to the Illinois/Wisconsin border; that is where they are the biggest pest."

Jones talked a bit about sequential binomial sampling or "speed scouting." The idea is that, using statistically valid verified methods, you can go out into the field and look at as few as 11 plants and make a decision at a glance as to whether you need to treat for soybean aphids or not.

"It sounds really complicated, but it's actually really, really simple because it consists of looking at a plant and making an estimate right there," he said. "Are there 40 or more soybean aphids on it? Essentially if you see aphids on it you're probably saying yes because they are really small and they're hard to see. So you do 11 randomly selected plants, and using a table, you make one of three decisions. If all 11 of them were positive then you already know you've exceeded the economic threshold to treat so you plan to make your insecticide application. If you have fewer than six positives, the table says you have not exceeded thresholds and you should come back and resample in about seven days. If it is between seven and 10, then the table suggests you take five more samples. The most samples you would have to make would be 33 and that's more often the exception than the rule. Usually you make the decision on the first 11. This was developed by Dave Ragsdale and his group out of the University of Minnesota."

Jones spoke about the natural enemies of soybean aphids, one of which is the multicolored Asian Lady Beetle which winters in everybody's house.

"It's beneficial in the summer and a pest in the winter," he said. "Both the adult and the immature feed on soybean aphids. That's actually their preferred food because they too are from China and soybean aphid was their preferred food there. Soybean aphids' preferred host was buckthorn which is also from China. We got all three from there; however, in winter it comes in and it just makes a mess in people's houses."

Buckthorn was brought here somewhere in the late 1800s. Soybean aphids showed up in southern Wisconsin, probably coming through Chicago's O'Hare Airport, in the summer of 2000. Today soybean aphids are in 27 U.S. states and Canadian provinces. The multicolored Asian Lady Beetle was brought over multi-

ple times by the USDA for control of other pests. It was released in the 1930s and it didn't take. It was released again in the 1960s and it didn't take. Then it was brought in again in the 1980s for the control of the pecan aphids and it took. Actually the first established population found was in Louisiana.

"Now we have their perfect food here too, and they've just exploded," he said.

The Asian Lady Beetles will not damage the plants. However, wine growers hate them because they will feed on the grapes. They take bites out of those sweeter fruits.

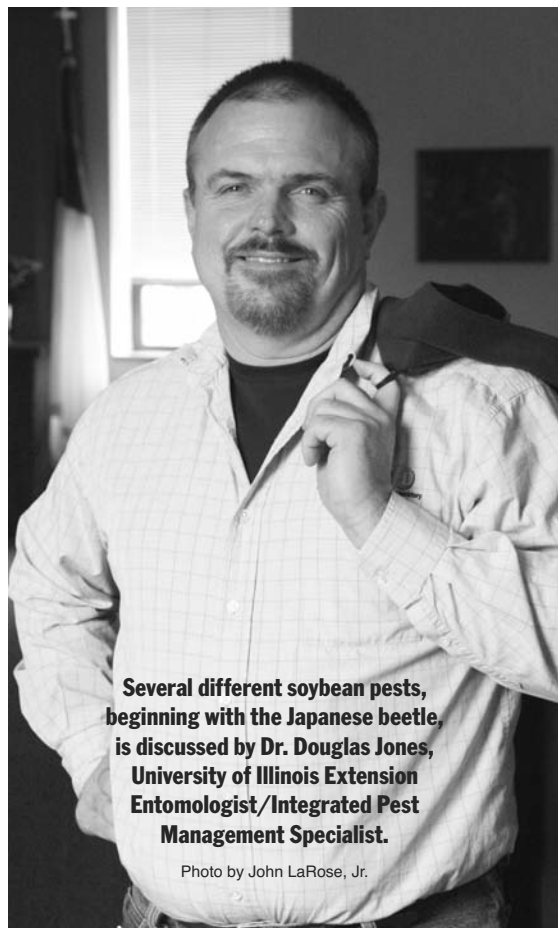
"They're not a major pest, but when you pick the grapes for wine and you get a multi-colored Asian Lady Beetle in the grapes and it gets mashed up it gives the wine a foul taste and ruins it. So they have to be very careful to make sure they don't have any of the beetles in there."

Jones' final topic was the insidious flower bug, which up north is actually the primary natural enemy of soybean aphids. Pirate bug is also another one but it is insidious flower bug that is the biggest natural enemy.

He also discussed *binodoxys communis*, a parasitic wasp that has been brought over and released for control.

"It's established in southern Wisconsin, but it's not a major player at this point," he said.

Jones also mentioned a potential new soybean



Several different soybean pests, beginning with the Japanese beetle, is discussed by Dr. Douglas Jones, University of Illinois Extension Entomologist/Integrated Pest Management Specialist.

Photo by John LaRose, Jr.

pest, the trochanter mealybug. It's a root feeding mealybug of soybeans that was found attacking soybeans in Kentucky in 2008 and then Ohio University has found it there also. It's also been found in Iowa attacking soybeans.

"It's a native of the United States as far as we can tell," he explained. "I did some brief research and learned it had been reported here in the United States all the way back into the 1800s. They found it on other plants, they didn't find it on soybeans. It's a root feeder so it feeds below ground mostly. It's associated usually with potassium deficiency symptoms in soybeans. It's one that we don't know if it is a real pest or not, we just know it showed up and it shows these deficiency symptoms. You actually test the soybeans and test the soil and there is plenty of potassium. So it's what we know to look for now. I can't tell you if it is in Illinois, but it probably is."

He said he will report more on the trochanter mealybug next year. He suggested that farmers just be aware about the mealybug.

He touched on soybean stem borers, which is a long horned borer beetle that is native to the United States. It feeds on a lot of plants and weeds, and is a major pest in sunflowers.

"It's one that can cause a lot of lodging in soybeans if you get a large population and I've heard some people say that one in a field is too many and I've heard other people say you can get quite a few, it's not such a big deal," he related.

He suggested not to be too concerned about it until you have one per foot of row.

"The best control is to take care of the residue in the field, plowing it under is one of the best things you can do because they bore down into the stem and then they overwinter in the stem of the soybean, so if you destroy that stem you destroy the beetle. You don't get as many of them, just one generation," he said.

Presently there's no recommendations on the Japanese beetle because researchers are still studying that.

"We're not making any real recommendations on this, just be aware of what it is," Jones said. "We think some soybean farmers are experiencing losses with them and it's something that in the future we may be advising. At this point unless you get at least one or two per plant when you sample I probably would not make applications."

"On soybean aphids the big thing is that last year was an apparition; unless they adapt we probably won't see them again any time soon," he said. "But another cool summer and it's going to become a confluence of cool summer and the availability of the aphids. They're good fliers and they move in well. If you get the prevailing winds right that blows them over and you have the cool summer you're going to have soybean aphids."

He added that the growth stage of the soybeans is very important in making your decisions.

"Once you get to R6, don't worry about soybean aphids any more. It's before R6 that you have to worry about them," Jones summed. Δ

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