



## EXTENSION

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### **Crop Insect, Soybean Aphid Update**

Not much has changed for the past couple of weeks, other than abundant rainfall in some areas. Spider mite populations, which had been on the increase in both corn and soybeans, are now way down and should not be a concern. On the soybean aphid front, there are some fields, often in protected areas near shelterbelts or streams, that have near economic levels of soybean aphids. If numbers reach 250 per plant and are increasing, it would still likely pay to treat for soybean aphids in fields that are still not to the R6 stage (beans touching in pods in one of the top four nodes). Raise the threshold to 500 per plant at the R6 stage. This has become a harder call, since normally aphid populations crash rapidly at the end of August. Will spraying at this time save enough yield to pay for treatment? At this later stage, it becomes a toss-up and the decision will probably result in a few bushels' difference either way.

### **Start Watching for 2<sup>nd</sup> Generation Bean Leaf Beetles**

We have begun to receive questions about second generation bean leaf beetle. The second generation beetles are appearing, so let's review of the biology of the beetle and discuss management.

Two generations of bean leaf beetles develop in Nebraska. The second generation over winters as adults and are the beetles seen early in the year feeding on seedling soybeans. These beetles feed, mate, lay eggs and die in early-mid June. There is usually a distinct period from mid June to early July when few if any beetles are present in the field, before the first generation emerges.

Total developmental time from egg to adult can range from 25 to 40 days. Because of this range of development, it is common to see adults from the first generation and the second generation in the field at the same time. Because the generations can overlap beetles can be present at some level from mid-July until the end of the growing season. Because of this overlap it is important to monitor beetles regularly to determine shifts in population, which will aid in management decisions.

Bean leaf beetles will feed on soybean leaves throughout the season, but leaf feeding seldom causes yield loss. Most damage (economic yield loss) occurs when 2<sup>nd</sup> generation beetles feed on the developing pods. This yield loss can occur in several ways. Pods may be clipped from the plants; however this is not the primary cause of yield loss. Many flowers and pods are aborted naturally and to blame pod loss on bean leaf beetle feeding may be a costly mistake.

University of Nebraska-Lincoln, cooperating with the counties and the counties and the U.S. Department of Agriculture

There are no thresholds that consider pod-drop. Beetles normally injure soybean pods by feeding on the outside layer of the pod, leaving a thin layer of tissue covering the seed. They do not usually eat into the developing seed, although this may occur on very small pods. Fungal pathogens may enter the pod from the feeding sites, causing seeds to appear shrunken, discolored, and moldy, which can result in dockage. After full pods are formed and seeds begin developing, soybeans are most susceptible to yield loss from pod feeding.

The best time to sample is before significant pod feeding occurs, but after second generation beetles have emerged. Second generation bean leaf beetles are or will be emerging and beetle numbers will build to a peak, which is usually in mid August through early September, depending on location. Beetle numbers will slowly decline as beans continue to mature and move to over wintering sites. Economic thresholds have been developed for two sampling methods: drop cloth (beetles per foot of row) or sweep net (beetles per sweep).

**Sampling methods for Bean Leaf Beetles** - Perhaps the most accurate way to sample beetles is with a drop (or shake) cloth. A drop cloth is a 3 x 3 ft piece of muslin or plastic attached on each side to dowel rods. Hold one rod against the base of the plants and lay the cloth between the rows. Shake the plants against the cloth to knock off the insects, and count the beetles.

Remember to estimate the number per row foot, so if you use a three-foot cloth divide your total by three. Also, sample throughout the field in several areas to get a good estimate of the population. In narrow row beans you can still sample with a drop cloth, but the procedure is slightly different. Set the rod at the base of the row of plants you want to sample and lay part of the cloth on the ground and hold the rest of the cloth upright or over the opposite row to be sampled. Shake the soybeans against the upright cloth, and then count the beetles knocked down on the bottom of the cloth.

If sampling with a sweep net, sweep at least five randomly selected sites. Walk through the field at an even pace, performing about 25 sweeping arcs. The best sweeping action for bean leaf beetle is a consistent upward motion through the foliage, using as much force as needed to move the net smoothly through the foliage. Bean leaf beetle activity varies during the day. Activity patterns suggest the best times to sample are around mid-morning or in the afternoon. Try to maintain a similar sampling time in each field to eliminate variability.

If the beetle counts are below the economic threshold, scout the field again about five days later. Stop scouting when the beetle counts begin to decline, the soybean pods begin to yellow (R7), or the field is sprayed. Thresholds are based on the number of beetles per foot of row (Tables 1 and 2) or beetles per sweep (Table 3), which varies according to total management cost and the crop value per bushel.

The tables show economic thresholds for beans in 30-inch and 7-inch rows. To use the tables find the number that fits both crop value and application costs. For example, if you set the value of your soybeans at \$5.00 per bushel and your application costs at \$7.00, you would need 6.4 or more beetles per foot of row to justify an application in 30-inch row beans, or 1.5 or more beetles per foot of row in 7-inch row beans.

Table 1. Economic thresholds in beetles per row foot for R5-R6 (beginning pod and full seed) soybeans in 30 inch rows.

Soybean Value	Pest Management Costs Per Acre					
	\$7.00	\$8.00	\$9.00	\$10.00	\$11.00	\$12.00
\$4.50	7.1	8.1	9.1	10.1	11.1	12.1
\$5.00	6.4	7.3	8.2	9.1	10.0	10.9
\$5.50	5.8	6.6	7.4	8.3	9.1	9.9
\$6.00	5.3	6.1	6.8	7.6	8.3	9.1

Table 2. Economic thresholds in beetles per row foot for R5-R6 (beginning pod and full seed) soybeans in 7 inch rows.

Soybean Value	Pest Management Costs Per Acre					
	\$7.00	\$8.00	\$9.00	\$10.00	\$11.00	\$12.00
\$4.50	1.7	1.9	2.1	2.4	2.6	2.8
\$5.00	1.5	1.7	1.9	2.1	2.3	2.5
\$5.50	1.4	1.5	1.7	1.9	2.1	2.3
\$6.00	1.2	1.4	1.6	1.8	1.9	2.1

Table 3. R6 Economic Thresholds (beetles per sweep). Numbers in parenthesis are for drilled soybeans with 7 inch row spacing.

Soybean Value	Pest Management Costs Per Acre			
	\$6.00	\$8.00	\$10.00	\$12.00
\$5.00	4 (3)	5 (4)	6 (5)	8 (5)
\$6.00	3 (2)	4 (3)	5 (4)	6 (5)
\$7.00	3 (2)	4 (3)	4 (3)	5 (4)

Economic thresholds for reproductive stage soybeans other than R6 are probably higher (more beetles are needed to justify a treatment). This is because pods on plants past R6 are maturing and there is less green pod tissue available for beetle feeding, and plants in earlier reproductive stages have greater yield compensation potential than those in R6 or older. Several insecticides can be used to control bean leaf beetles. Be aware that most have pre-harvest intervals of 14 or more days. Information on insecticide selection and use can be found at <http://entomology.unl.edu/instabls/beanlft.htm> at the UNL Entomology Department web site ([www.entomology.unl.edu](http://www.entomology.unl.edu)).

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