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Here Come the Bean Leaf Beetles!

Jon J. Tollefson

Iowa State University, tolly@iastate.edu

Marlin E. Rice

Iowa State University, merice@iastate.edu

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Abstract

The bean leaf beetle overwinters as an adult that feeds on young soybeans in May and June. They lay eggs that produce the first generation, which attacks beans in July. The subsequent generation, the second, is of most concern when protecting the plant from the beetles feeding because it attacks the pods and beans as well as foliage.

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Here Come the Bean Leaf Beetles!

By Jon Tollefson and Marlin Rice, Department of Entomology

The bean leaf beetle overwinters as an adult that feeds on young soybeans in May and June. They lay eggs that produce the first generation, which attacks beans in July. The subsequent generation, the second, is of most concern when protecting the plant from the beetles feeding because it attacks the pods and beans as well as foliage.

The first generation adult bean leaf beetles began emerging from the soil during the week of July 7 in central Iowa. To determine if the second generation will reach economic numbers and to avoid injury to the beans as the populations increase, the first generation can be sampled now. If the number of beetles present exceeds the economic threshold, the farmer should be ready to treat the field when the second generation begins to emerge in late August from the soil and the presence of new adults, which are soft and gray (see photo), in the field is confirmed.

The scouting methods explained in this article sample the first generation, which is occurring now, to predict the size of the second generation, which will occur in late August and September.



Newly-emerged from the soil, a bean leaf beetle is soft and gray in color.
Marlin E. Rice

Sample soybean fields now. When the number of beetles reaches or exceeds the threshold (Table 1 or Table 2), stop sampling. If the sample is below the threshold, sample the following week. If the sample remains below the threshold, sample a third and final week. If the threshold is not reached, an economic infestation of bean leaf beetles should not occur in your pod-stage soybeans during August and September.

The sampling procedures are explained below. The treatment thresholds for \$7 to \$15 control costs were taken from previous research and extension publications. Because of the unusually high control costs and value of soybeans, the threshold values for \$18 and \$20 control costs were calculated from the earlier data assuming that the increase in the thresholds would be linear.

Drop cloth

- Walk 100 feet in from the field edge and scout each field and each variety separately.
- Place a 3-foot-wide strip of cloth on ground between the rows.
- Bend the plants on one row over the cloth, and shake them vigorously.
- Count the number of beetles on the cloth.
- Repeat the procedure four times for each 20 acres of the field.
- Determine the average number of beetles per 3 foot of row.
- See Table 1 for the number of beetles per 3 foot of row necessary to justify insecticide treatment for the second-generation adults in August or September.
- If the number of beetles is below the economic threshold, sample your fields again the following week, or a third week if necessary.

Sweep net

- Walk 100 feet in from the field edge and scout each field and each variety separately.
- Take 20 sweeps down the row, not across the row.
- Repeat the procedure four times for each 20 acres of the field.
- Determine the average number of beetles per 20 sweeps.
- Table 2 shows the number of beetles per 20 sweeps that justifies insecticide treatment for the second-generation adults.
- If the number of beetles is below the economic threshold, sample your fields again on the following week, or a third week if necessary.

The treatment thresholds are for the prevention of economic injury to the soybeans by the adult bean leaf beetle. They do not include prevention of disease transmission, which may accentuate the impact of the beetles on soybeans.

Table 1. Economic thresholds for first-generation bean leaf beetles (average number of beetles per 3 foot of row). If these numbers are reached in July, then spray the next generation in late August or September when soft gray beetle are first found in the field.

\$/bu	Management cost (\$/acre)										
	7	8	9	10	11	12	13	14	15	18	20
15	2.0	2.2	2.5	2.8	3.0	3.3	3.5	3.8	4.1	5.0	5.6
14	2.1	2.4	2.7	2.9	3.2	3.5	3.8	4.1	4.3	5.1	5.6
13	2.3	2.6	2.9	3.2	3.5	3.8	4.1	4.3	4.6	5.4	6.0
12	2.4	2.8	3.1	3.4	3.7	4.1	4.4	4.7	5.0	5.8	6.4
11	2.6	3.0	3.3	3.7	4.1	4.4	4.8	5.1	5.5	6.6	7.3
10	2.9	3.3	3.7	4.1	4.4	4.8	5.2	5.6	6.0	7.2	7.9
9	3.2	3.6	4.1	4.5	4.9	5.3	5.8	6.2	6.6	7.9	8.7
8	3.6	4.1	4.5	5.0	5.5	6.0	6.5	7.0	7.5	9.0	9.9
7	4.1	4.6	5.2	5.7	6.3	6.8	7.4	7.9	8.5	10.1	11.2
6	4.7	5.3	6.0	6.6	7.3	7.9	8.6	9.2	9.9	11.8	13.1
5	5.6	6.4	7.2	7.9	8.7	9.5	10.3	11.1	11.8	14.1	15.7
4	7.0	7.9	8.9	9.9	10.9	11.8	12.8	13.8	14.8	17.7	19.7

Table 2. Economic thresholds for first-generation bean leaf beetles (average number of beetles per 20 sweeps. Note: sweeps should be taken the length of the row, not across the row). If these numbers are reached in July, then spray the next generation in late August or September when soft gray beetle are first found in the field.

\$/bu	Management cost (\$/acre)										
	7	8	9	10	11	12	13	14	15	18	20
15	8.1	9.2	10.2	11.3	12.4	13.4	14.5	15.6	16.6	19.8	21.9
14	8.6	9.8	10.9	12.1	13.2	14.3	15.5	16.6	17.8	21.2	23.5
13	9.2	10.5	11.7	12.9	14.2	15.4	16.6	17.9	19.1	22.8	25.2
12	10.0	11.3	12.6	14.0	15.3	16.6	18.0	19.3	20.6	24.6	27.2
11	10.8	12.3	13.7	15.2	16.6	18.1	19.5	21.0	22.4	26.7	29.6
10	11.8	13.4	15.0	16.6	18.2	19.8	21.4	23.0	24.6	29.4	32.6
9	13.1	14.8	16.6	18.4	20.2	22.0	23.7	25.5	27.3	32.6	36.2
8	14.6	16.6	18.6	20.6	22.6	24.6	26.6	28.6	30.6	36.6	40.6
7	16.6	18.9	21.2	23.5	25.8	28.1	30.3	32.6	34.9	41.8	46.3
6	19.3	22.0	24.6	27.3	30.0	32.6	35.3	38.0	40.6	48.5	53.8
5	23.0	26.2	29.4	32.6	35.8	39.0	42.2	45.4	48.6	58.2	64.6
4	28.6	32.6	36.6	40.6	44.6	48.6	52.6	56.6	60.6	72.6	80.6

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Jon Tollefson is a professor of entomology with extension and research responsibilities. Marlin E. Rice is a professor of entomology with extension and research responsibilities.

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