Green Cloverworms Appear in Soybean

By Michael McCarville, Erin Hodgson and Matt O'Neal, Department of Entomology

Iowa State University researchers are seeing green cloverworm defoliating soybean in central Iowa (Fig. 1). The caterpillars are a rare pest of soybean in Iowa, but researchers have reported higher than normal populations this year. These moths migrate into Iowa from southern states each year. The last major outbreaks occurred in the 1970s (Fig. 2).

Fig. 1.Sub-economic defoliation caused by green cloverworm

Fig. 2. Economically damaging levels of green cloverworm were last seen in Iowa forty years ago.

The larvae appear pale green with one or two white stripes along their sides. Their three pairs of abdominal prolegs distinguish them from other similar caterpillars. For example, armyworms and cutworms have four pairs of prologs; loopers only have two pairs of prolegs. Green cloverworm adults are black and gray moths with a obvious snout-like mouth, and can be distinguished from other moths using a chart published in the June 2001 ICM News.

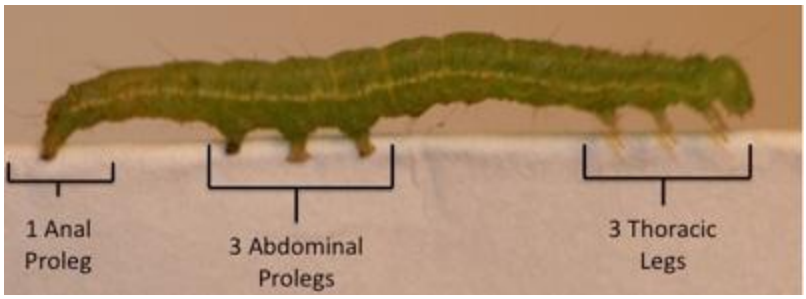

Fig. 3. Green cloverworm larvae have a horizontal white stripe and three pairs of abdominal prolegs.

In Iowa there are three generations a year, with the first typically seen in alfalfa. The second generation is capable of reaching economic levels in soybean in July; however, the third generation is normally kept below outbreak levels in August by natural occurring fungi that infect the caterpillars.

Larry Pedigo, research entomologist at Iowa State, developed economic thresholds based on his research in the 1970s and 1980s. Management recommendations from his work (Ostlie and Pedigo 1985) appear in the table below with thresholds adapted for today's management costs and crop value.

Crop value ($ per bushel)	Treatment cost per acre (insecticide + application)						
	$6	$7	$8	$9	$10	$11	$12
	No. of larvae per foot of row						
$6.00	7.4	8.6	9.8	11.1	12.3	13.5	14.7
$7.00	6.3	7.4	8.4	9.5	10.5	11.6	12.6
$8.00	5.5	6.5	7.4	8.3	9.2	10.1	11.1
$9.00	4.9	5.7	6.6	7.4	8.2	9.0	9.8
$10.00	4.4	5.2	5.9	6.6	7.4	8.1	8.8
$11.00	4.0	4.7	5.4	6.0	6.7	7.4	8.0

Table 1. Economic thresholds for green cloverworm in soybean

Recommendations are based on sampling with a drop cloth. Sweep net sampling based recommendations do not exist. Below is a description of how to sample with a drop cloth. Remember to scout each field and each variety separately.

Drop cloth technique

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

Other insects are capable of defoliating soybean (e.g., bean leaf beetle, armyworms, etc.). Even if green cloverworms are below treatment levels, fields may still warrant treatment if the combined defoliation of multiple pests approaches 20 percent. People tend to overestimate percent defoliation, so use Figure 5 as a reference showing a gradient of defoliation levels.

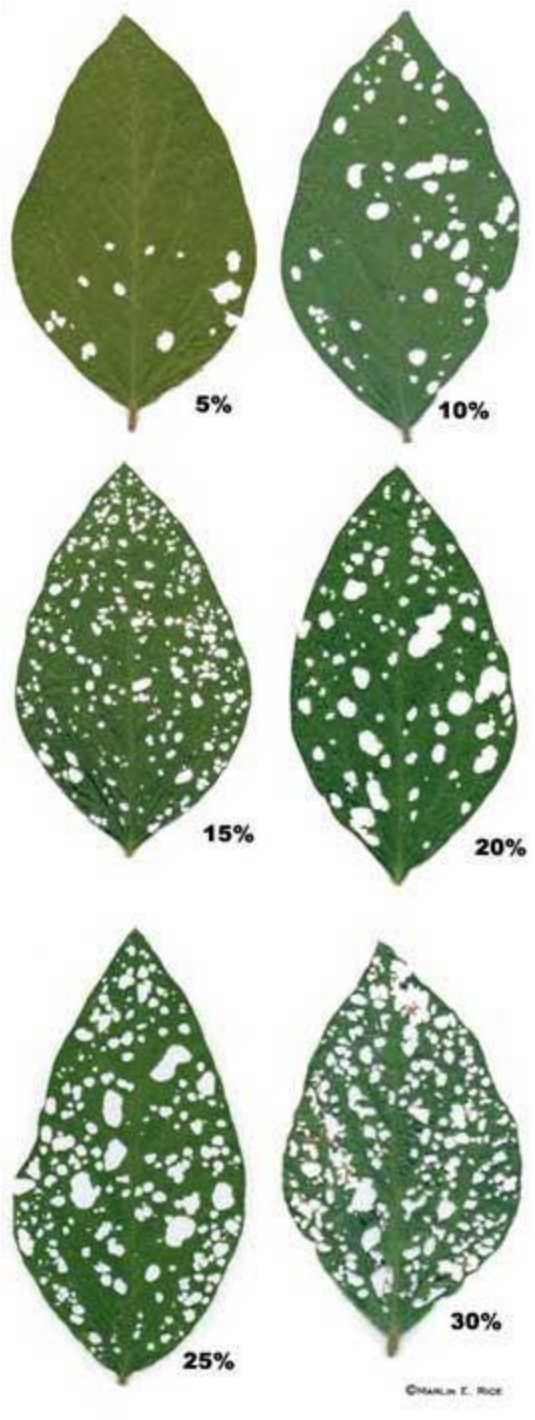

Fig. 5. Visual estimations of percent defoliation in soybean

Michael McCarville is a Department of Entomology graduate student; he can be reached at 515-294-8663 or by email at mikemcc@iastate.edu. *Erin Hodgson is an assistant professor of entomology with extension and research responsibilities. She can be contacted by email at ewh@iastate.edu or phone 515-294-2847. Matt O'Neal is an*

assistant professor of entomology with teaching and research responsibilities. He can be reached at oneal@iastate.edu or at 515-294-8622.