Japanese Beetle in Corn and Soybean Fields

- High populations of Japanese beetles (Popillia japonica Newman) can occur across the region.
- Feeding by adult beetles can be a serious problem in corn and soybean fields.
- Scouting is crucial, especially during the reproductive stages of both crops.

Mild winters and early planting generally contribute to higher Japanese beetle populations. Areas heavily infested with the larval stage white grub is not an indicator of severe injury from adult beetles in the same area. Adults can reduce yield potential by interfering with pollination in corn and damaging leaf tissue and pods on soybean plants.

Identification and Life Cycle

Adult Japanese beetles are nearly a ½-inch long, have a metallic green head and neck region, reddish to bronze wing covers, rows of six white bristle bunches along each side of their abdomen, and live 30 to 60 days (Figure 1). Adults emerge from the soil starting in late May and early June, with peak emergence occurring 4 to 5 weeks later. Mating occurs soon after emergence causing the females to burrow 2 to 4 inches into the soil and lay 1 to 4 eggs every 3 to 4 days for several weeks.

The grubs emerge from the eggs in about 10 days and grow quickly to full size, about 1-inch long. The grubs feed on the roots of living plants and then overwinter. When soil temperature climbs above 50 °F in the spring, the grubs begin to move toward the soil surface to feed and pupate prior to emerging as adults.

Corn Scouting and Thresholds

The adults feed on leaves, tassels, silks, and pollen. Corn leaves may appear “lacy” or skeletonized, but leaf feeding is rarely of economic importance. Economic damage can occur when beetles clip silks during pollination (Figure 2), which can result in partially pollinated ears (Figure 3). Silk clipping after pollination does not affect yield potential.

When scouting corn for Japanese beetles, a representative portion of the entire field should be evaluated. If sampling is only conducted near field edges, where populations of Japanese beetles are usually clumped together, populations across the field could be overestimated. An insecticidal treatment should be considered during corn silking stage if:

- There are 3 or more Japanese beetle adults/ear, and
- Silks have not been clipped to less than a 1/2-inch, and
- Pollination is less than 50% complete, and
- Japanese beetles are still present and actively feeding.

Soybean Scouting and Thresholds

Although Japanese beetles can cause extensive defoliation, soybean plants have the capability to compensate for the damage, and defoliation seldom affects yield potential (Figure 4). Flowering soybean fields should be scouted for the presence of Japanese beetles and the extent of defoliation. The percent defoliation should be estimated on randomly selected leaves in at least five different areas of the field. Insecticide applications should be considered if:

- 30% defoliation occurs prior to bloom, or
- 20% defoliation occurs after bloom, and
- Japanese beetles are present and actively feeding.
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Table 1. Single active ingredient insecticides labeled for control of Japanese beetles in corn and soybean.1,2,7,8

<table>
<thead>
<tr>
<th>MOA Group Number</th>
<th>Insecticide</th>
<th>Rate/acre in corn</th>
<th>Rate/acre in soybean</th>
</tr>
</thead>
<tbody>
<tr>
<td>3A</td>
<td>carbaryl (Sevin® 4F, Carbaryl 4L)</td>
<td>1 to 2 qts</td>
<td>0.5 to 1 qt</td>
</tr>
<tr>
<td>3A</td>
<td>cyfluthrin* (Baytene® XL)</td>
<td>1.6 to 2.8 fl oz</td>
<td>1.6 to 2.8 fl oz</td>
</tr>
<tr>
<td>3</td>
<td>bifenthrin* (Capture® 2EC- CAL)</td>
<td>2.1 to 6.4 fl oz</td>
<td>2.1 to 6.4 fl oz</td>
</tr>
<tr>
<td>3</td>
<td>esfenvalerate* (Asana® XL)</td>
<td>5.8 to 9.6 fl oz</td>
<td>5.8 to 9.6 fl oz</td>
</tr>
<tr>
<td>3</td>
<td>gamma-cyhalothrin* (Declare®, Proaxis®)</td>
<td>1.02 to 1.54 fl oz (Declare)</td>
<td>2.56 to 3.84 fl oz (Proaxis)</td>
</tr>
<tr>
<td>3</td>
<td>imidacloprid (Prey® 1.6)</td>
<td>___**</td>
<td>3.75 fl oz</td>
</tr>
<tr>
<td>3</td>
<td>lambda-cyhalothrin* (Warrior II with Zeon Technology®)</td>
<td>1.28 to 1.92 fl oz</td>
<td>1.6 to 1.92 fl oz</td>
</tr>
<tr>
<td>3A</td>
<td>permethrin* (Ambush®, Pounce® 25WP)</td>
<td>___**</td>
<td>6.4 to 12.8 oz (Ambush) 3.2 to 6.4 oz (Pounce)</td>
</tr>
<tr>
<td>3</td>
<td>zeta-cypermethrin* (Mustang®, Maxx, Respect®)</td>
<td>2.72 to 4.0 fl oz</td>
<td>2.8 to 4.0 fl oz</td>
</tr>
</tbody>
</table>

*Restricted Use Pesticide - use restricted to certified applicators. **product is not labeled for this use in this crop.

Control

Individual state insecticide recommendations for the control of Japanese beetles can differ and must be followed. Thresholds and single active ingredient insecticide recommendations for controlling Japanese beetles in corn and soybean crops in Indiana can be found in Table 1. Combinations of these active ingredients are also available. Damage from Japanese beetles can add to other stresses the crop is experiencing, and economic thresholds may need to be adjusted if plants are under moisture stress.1 This, along with commodity prices, should be taken into consideration when using thresholds to determine if insecticide treatment is needed. Insecticides may initially control or knock-down a population; however, poor residual activity and the mobility of the insect could lead to the need for a second application if populations resurge later. With subsequent treatments, consider an insecticide with multiple or different modes of action (MOA). The first column in Table 1 lists the Group Number assigned by the Insecticide Resistance Action Committee, which represents an MOA classification.3 Sub-groups are assigned to insecticide compounds within an MOA when the structure differs, and metabolism is believed to be by another enzyme. For example, Group 3 insecticides are sodium channel modulators, and the 3A Sub-group represents pyrethroids which have a specific structural component within the Group 3 MOA.

Sources
8 Product labels. Web sources verified 06/27/16.

For additional agronomic information, please contact your local seed representative. Developed in partnership with Technology Development & Agronomy by Monsanto.

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