Asiatic Garden Beetle

CROP BULLETIN

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KEY POINTS

- Asiatic garden beetle (*Maladera castanea*) has historically been a sporadic pest of field crops but has recently become a more frequent pest of corn and soybean.
- Crop injury in corn and soybean is primarily the result of larval root feeding. Root damage can cause stunting and discoloration of plants and can kill plants if severe enough.
- A high-rate insecticide seed treatment used in combination with liquid bifenthrin applied at planting appears to be the best option for protection in corn.

DISTRIBUTION AND PEST STATUS

- Asiatic garden beetle (*Maladera castanea*) is a non-native species in North America that was introduced to the northeast U.S. from Japan in the 1920s.
- Following its initial introduction, populations have spread through the Northeastern U.S. and parts of Eastern Canada, westward – as far as Kansas and Missouri, and southward – as far as Georgia and Alabama (Skelley, 2013).
- Asiatic garden beetle has historically been a sporadic pest of field crops; however, it has recently become a more frequent pest of corn and soybean in Indiana, Michigan, and Ohio.

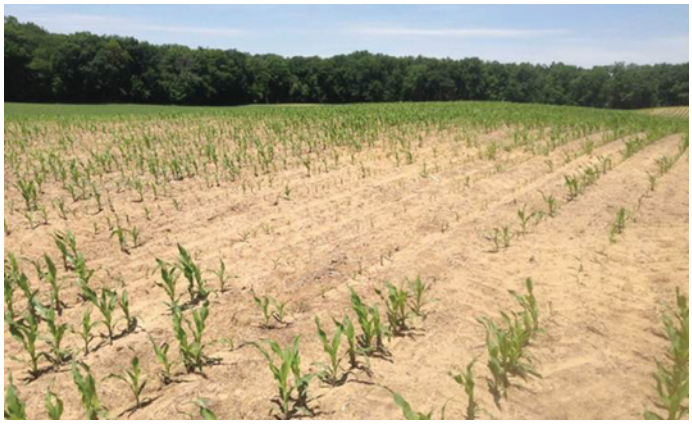

Figure 1. Asiatic garden beetle feeding may be scattered across a field, but the most severe damage is often concentrated in areas of intensive egg laying or better survival of larvae, commonly in sandy spots. Damage may be compounded by other factors affecting plant vigor.

HOST RANGE

- Asiatic garden beetle has a wide host range – over 100 hosts are known, consisting primarily of perennial ornamentals.
- It has historically been a pest of ornamentals and turf grass but can also damage vegetables and row crops, including corn, soybeans, and wheat.
- Asiatic garden beetle is also known to feed on several common weed species, including marestail, giant ragweed, chickweed, purple deadnettle, pokeweed, and Virginia creeper (DiFonzo, 2018; Pekarcik, 2018).

LIFECYCLE

- Asiatic garden beetle undergoes one generation per year with four stages: egg, larva, pupa, and adult.
- They overwinter in the soil as a small grubs, which feed on the roots of grasses and weeds in early spring.
- Larvae typically pupate in late May and June and emerge as adults in late June and July. Females burrow into the soil to lay their eggs, which hatch in about two weeks.

Figure 2. Asiatic garden beetle larva (left) with arrow indicating the enlarged maxillary palps, and adults (right). (Beetle photo: David Shetlar, Ohio State University.)

IDENTIFICATION

- Larvae are up to ½ inch long and can be identified most easily by the enlarged maxillary palps just behind the mouth parts. These are light-colored fleshy appendages that appear to be in constant motion (Figure 2).
- Asiatic garden beetle larvae also have a characteristic anal slit and semi-circular raster pattern under the tail.
- Adults are scarab-shaped, tan- or cinnamon-brown-colored beetles with a slight iridescent sheen. They are slightly smaller than Japanese beetles (about 5/16 to 3/8 inch in length).

INJURY SYMPTOMS AND IMPACT ON CROP

- Crop injury in corn and soybean is primarily the result of larval root feeding. Symptoms closely resemble root feeding by other grub pests including annual and biennial white grubs and Japanese beetles in the spring.
- Larval feeding removes root hairs and may damage the mesocotyl between the seed and the main root system of corn. This reduces early vigor until the affected plants can regrow an adequate root system.

- Root damage can cause stunting and discoloration of plants and can kill plants if severe enough. Stand losses of over 40% have been observed in corn (Pecarcik, 2018).
- Stand reduction in soybean can be less noticeable due to the greater number of plants/acre compared to corn.
- Aboveground symptoms are often not visible until feeding has already been underway for several days.
- Heavy infestations are most common in sandy soils.
- Adult feeding is rarely a problem in row crops but may be noticeable on nearby vegetable or ornamental foliage as feeding on the leaves (especially at night and particularly around the leaf edges).

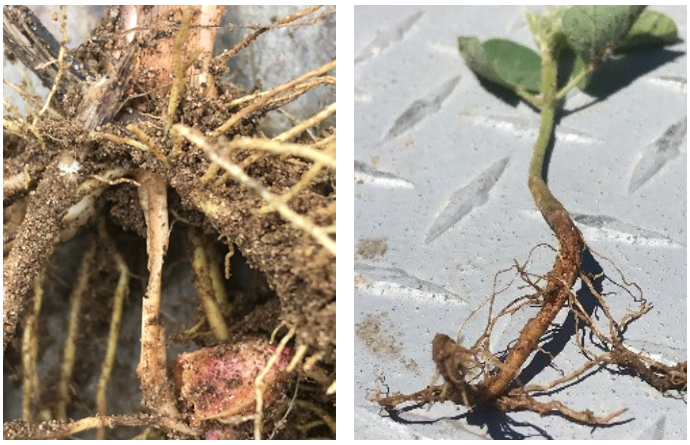

Figure 3. Root damage on corn and soybean seedlings caused by Asiatic garden beetle feeding in Indiana in 2018. (Photos by Lance Shepherd, Field Agronomist.)

RELATED OR OFTEN MISIDENTIFIED GRUBS

- Manure scarabs – generally smaller size, found associated with pastures or manure.
- Annual, biennial grubs and Japanese beetle – generally over ½ inch in length with a different raster pattern and no maxillary palps. Asiatic garden beetle grubs are smaller and generally more active than these other common grubs.

Asiatic garden beetle | **Japanese beetle** | **Annual white grub** | **True white grub**

Figure 4. Raster patterns of Asiatic garden beetle and other grubs common to field crops.

MANAGEMENT CONSIDERATIONS

Trapping

- Limited success of identifying elevated grub numbers prior to planting has been made with wireworm bait stations.
- Adult populations have also been monitored with immersion-type western bean cutworm traps.

Scouting

- Scouting for Asiatic garden beetle larvae prior to planting to identify fields at risk of damage provides the only real opportunity to protect the crop by including an insecticide at planting (MacKellar and DiFonzo, 2018).
  - Prior to spring tillage, dig around any alternate weed hosts that are present in the field such as marestail or giant ragweed to look for larvae.
  - Check freshly tilled soil during tillage operations for larvae, particularly if there are a lot of birds feeding in the tilled soil.
- Scout for Asiatic garden beetle larvae in corn by digging around plants in the field during the early vegetative growth stages to look for signs of root feeding or presence of larvae.
  - Focus scouting on plants that appear to be suffering some sort of stress. Damaged plants often appear stunted and purplish.
  - Asiatic garden beetle has historically been most prevalent in fields with sandy soil; however, feeding injury has become more common in loamy and heavier soils.
  - Damage often occurs in irregular patches.
  - Root feeding ceases when larvae enter the pupal stage, typically around the end of May. Later-planted fields generally have a lower risk of root feeding damage.
- Asiatic garden beetle adults are active from June through September. They are nocturnal and attracted to outdoor lights and feed on nearby foliage. Monitor these locations to get a sense of relative population levels in an area.

Favorable Conditions

- Soil disturbance may promote larval mortality and predation to a low degree; thus, no-till may be conducive to higher survival.
- Soil saturation in spring tends to increase mortality, similar to corn rootworm, and can force the larvae to the soil surface where they are exposed to predators.
- Higher Asiatic garden beetle pressure has tended to be associated with relatively dry spring conditions in recent years. A dry spring could present a worst-case scenario for crop damage where larval feeding is combined with poor root development.

Weed Management

- Asiatic garden beetles appear to have a preference for several common weed species such as giant ragweed and marestail.
- Managing weed populations can help prevent them from acting as an attractant for egg-laying adults later in the growing season.
- Grubs feeding on weeds early in the season appear to continue feeding on the weeds even after a corn crop is established. Controlling these weeds with a herbicide application will force the feeding grubs to shift their feeding to the corn plants, which can cause a rapid escalation in damage to the corn crop.

INSECTICIDES

- Insecticide seed treatments are the mostly widely used form of protection against larval feeding in corn; however, high rates are needed for higher populations, and they may not provide complete protection.
- A FIFRA 2(ee) recommendation is in place for Bifenture® LFC and Capture® LFR® on Asiatic garden beetle at a rate of 8.5 oz/acre. Always read and follow product label guidelines.
- Best results for protection against high Asiatic garden beetle feeding pressure have been reported with a high-rate insecticide seed treatment used in combination with liquid bifenthrin applied at planting.
- Corn products are available with an enhanced CRW package with a 1250 rate of Lumisure™ insecticide seed treatment.
- Later-planted fields generally have a lower risk of root feeding damage from Asiatic garden beetle, so may be less likely to benefit from an insecticide application.

REFERENCE

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