Monitor Beet Armyworms (BAW) in Cotton

Beet armyworm (BAW), Spodoptera exigua (Hübner) (Lepidoptera: Noctuidae) can be a cotton pest throughout the growing season but can be more prevalent under droughty conditions and in fields with pigweed pressure. BAW has a wide range of hosts that include field, vegetable and flower crops as well as many weed species. This wide range of hosts presents additional challenges for cotton producers when developing a BAW management plan. A study in 2001 indicated that BAW consume cabbage, pepper, sunflower, cotton, and pigweed in preferential order. However, the BAW that fed on pigweed grew faster and matured quicker than other host species tested.[1] Cotton can be damaged by BAW at a very high rate. Treatment thresholds vary greatly and depend on time of year, crop stage at outbreak, the plant parts being attacked, and the abundance of predatory and parasitic insects. BAW lacks a diapause mechanism so it can only successfully overwinter in warmer climates, therefore it will need to migrate into most cotton growing areas during the growing season.

Identification

Larvae. Young BAW larvae are pale green to yellow in color and can be identified by a small black dot directly above the middle pair of true legs. Young beet armyworms hatch, “web up”, and feed together on leaves for about five days. Leaf feeding damage is often initially found on just the leaf surface (“skeletonized foliage”) rather than chewing large holes through the leaf. This damage, called hits, turn tan and are distinctive and easy to see when walking through a cotton field. As larvae mature, usually in two to three weeks, they become darker in color (olive green to almost black) and form yellow lateral stripes along each side of the body and are about 1.25 inches long.

Figure 1. Beet armyworm larva feeding on leaf. Photo courtesy of Whitney Cranshaw, Colorado State University, Bugwood.org.

Figure 2. Beet armyworm larva (mature).

Adults. Moths are grey to brown with two yellowish bean-shaped spots near the middle of the wings. Width of wingspan is 1 to 1.5 inches. BAW typically have one to four or more generations per year (depending on the cotton production area). Development from the egg stage to the adult growth stage (turnover) takes as few as 24 days, at normal summer temperatures.[2]

Figure 3. Beet armyworm adult moth. Photo courtesy of Whitney Cranshaw, Colorado State University, Bugwood.org.

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Eggs. BAW eggs are white to pale green in color and have a round shape. BAW eggs are laid in clusters and covered with cottony white scales. Adult females can lay an average of 500 to 600 eggs in a four to ten days, with each egg mass containing 80 to 150 eggs.[2]

Figure 4. Beet armyworm egg mass. Photo courtesy of Ronald Smith, Auburn University, Bugwood.org.

Damage. BAW larvae are primary cotton foliage feeders but may also feed on cotton squares, blooms, and occasionally on small bolls. Larvae can also bore into the main stem causing injury to the terminals. Larvae typically feed for three weeks as they progress through five to six larval stages.[1]

Figure 5. Beet armyworm feeding damage. Photo courtesy of Ronald Smith, Auburn University, Bugwood.org.

Management strategies

1. Technology. Bollgard® 3 Technology is designed to improve protection against fall armyworm, beet armyworm, and cotton bollworm as well as increase the durability and effectiveness of the trait technology. Bollgard® 3 Technology, available in Bollgard® 3 XtendFlex® cotton and Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology, builds on Bollgard II® XtendFlex® cotton with a third protein: Vip3A.
2. Weed control. With such a wide range of host plants, BAW can establish on many weed species and move to a cotton crop in season. Controlling weed species that support BAW around cotton crops and removing weed escapes in a growing cotton crop, especially pigweed (Amaranthus spp.), can help reduce potential BAW damage.
3. Chemical control. See Table 1.

Table 1. Insecticides effective against beet armyworm.

Insecticide* Active Ingredient Trade Name	Amount of Formulation per Acre	Pounds Active Ingredient per Acre	Number of Acres 1 Gallon or 1 Pound Dry Can Treat	Post-harvest interval PHI (days)
chlorantraniliprole (D) Vantacor™ 5SC Insecticide	1.2–2.5 oz	0.047–0.098	106.6–51.2	21
indoxacarb (OX) Steward® 1.25EC Insecticide	9.2–11.3 oz	0.09–0.11	13.88–11.37	14
methoxyfenozide (IGR) Intrepid 2F® Insecticide	4–10 oz	0.0625–0.16	32–12.8	14
spinosad (SPN) Blackhawk® 36WG Insecticide	2.4–3.2 oz	0.054–0.072	6.7–5	28

*See label for exact rates and application requirements.

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Certain organophosphate and pyrethroid insecticides are particularly damaging to beneficial insects that help control BAW. Prior to bloom, use short residual organophosphates and other non-pyrethroid materials only when necessary to control other pests. Reserve use of pyrethroids until midseason to help minimize reliance on organophosphates. Established populations of BAW can be difficult and expensive to control. Late-season foliage-feeders cause less damage than midseason fruit-feeders. Cotton nearing maturity can tolerate relatively high BAW populations without losing yield. When treating BAW, multiple, close-interval applications (three to five days apart) may be needed against high populations. Apply treatments against hatching to 1/4-inch-long larvae for best results. Maximize coverage to undersides of leaves. Increasing spray volume and pressure may improve control when treating by ground.[3]

Predatory and Parasitic Insects of Beet Armyworm

Natural enemies can provide good control of armyworms in many fields. Predators include bigeyed bugs, spiders, minute pirate bugs, damsel bugs, assassin bugs, and lacewings. The parasitic wasp, Hyposoter exiguae, is the most important of at least 10 parasites attacking BAW.[4]

Factors that Contribute to Beet Armyworm Outbreaks

Production of an early crop and preservation of beneficial insects are the most important factors in reducing risks of beet armyworm (BAW) outbreaks. Other factor that can increase BAW pressure include:

1. Mild winters (the absence of prolonged freezing temperatures).
2. Heavy early-season, broad-spectrum insecticide use.
3. Continued hot, dry weather conditions.
4. Weather conditions conducive for long-distance migration of adult moths.
5. Sandy and droughty fields.
6. Skip-row planting.
7. Fields with poor stands with an open canopy.
8. Drought-stressed plants and fields infested with pigweeds.[5]

Beet Armyworm Scouting and Thresholds

Scout ten locations per field every five to seven days for egg masses, larvae or damage. Egg masses are typically laid on both sides of the leaf. Inspect cotton leaves, blooms, and squares for insect feeding damage. Damage to the main stem can also cause the terminal to abort.

During early to mid-season, if beneficial insect numbers are low and the risk for BAW outbreaks is high, initiate treatment at two to five “hits” (egg masses and/or clusters of small larvae) per 100 feet of row. Treatment thresholds vary greatly depending on time of year and stage of crop when BAW outbreaks occur, plant parts being attacked, and presence or absence of other predisposing factors.[3]

For more information, contact your local Deltapine® representative or Extension agent.

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Sources

[1]Capinera, J.L., 2017. Features creatures. Common name: beet armyworm. University of Florida. Institute of Food and agriculture. https://entnemdept.ufl.edu/creatures/veg/leaf/beet_armyworm.htm.

[2]2019. Cotton pests: scouting and management. University of Missouri Extension. IPM 1025. https://extension.missouri.edu/publications/ipm1025?p=2.

[3]2023. Insect control guide for agronomic crops. Mississippi State University Extension. http://extension.msstate.edu/publications/publications/insect-control-guide-for-agronomic-crops#cotton

[4]2017. Beet armyworm. Agriculture: alfalfa pest management guide. University of California. UC IPM. https://ipm.ucanr.edu/agriculture/alfalfa/beet-armyworm/#:~:text=Predators%20include%20bigeyed%20bugs%2C%20spiders,10%20parasites%20attacking%20this%20pest.

[5]Beet armyworm. Cotton insect management guide. Texas A&M AgriLife Extension Service. https://cottonbugs.tamu.edu/foliage-feeding-pests/beet-armyworm/.

Web sources verified 01/12/23.

Legal Statements

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