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AG FACTS

Tomato, Eggplant, and Pepper Insect Pests

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Cutworms may overwinter as 1/2- to 1-inch-long larvae (fig. 1) or as eggs in the soil. They often cut plants off at the soil surface. Cutworms may be most abundant in weedy areas of a field or adjacent to cover crop strips after the cover crops are killed or tilled down. They pupate in the soil (fig. 2), and adult moths (fig. 3) emerge in June or July. They may have from 1 - 3 generations per year, but typical cutworm injury occurs only early in the season when plants are small. New transplants should be checked regularly during the first few days after transplanting.

Colorado potato beetles (fig. 4) overwinter in soil in fields and field borders. They emerge in the spring and begin feeding on tomatoes and eggplant, mating and laying bright orange eggs (fig. 5). Potatoes, nightshade and horse nettle are also hosts. Larvae (fig. 6) also feed on foliage and sometimes injure tomato fruit. Potato beetles may have from 1 - 3 generations per year in Michigan, depending on the length of the season. In mid-August, most egg laying ceases and adults begin to enter the soil for overwintering.

Crop rotation and management of weed hosts are important to reduce potato beetle populations and reduce the need for insecticide treatment. Tomatoes or eggplant planted adjacent to current or previous year's infested potato fields may be heavily damaged. The Colorado potato beetle has become extremely resistant to insecticides in many parts of Michigan. Consult your local MSU Extension agent for the latest information on how to reduce resistance problems.

Green peach aphids (fig. 7) (1/16-inch long, light green) are by far the most important aphids on eggplant and peppers in Michigan. **Potato aphids** (1/8-inch long, green or pink) are most common on tomatoes. Aphids suck plant juices and also excrete a sticky honeydew which may reduce product quality. They can transmit virus diseases to peppers (fig. 8).

Aphids overwinter as eggs on a variety of crops and weeds. The eggs hatch in the spring. After one or more generations on the overwintering host, winged aphids are produced and migrate to a variety of other hosts, including vegetable crops. Winged forms appear throughout the season, especially when the host plant is dying or aphids are becoming crowded. Each aphid can give birth to 50 to 100 young. The mother does not lay eggs but gives birth to baby aphids. All of these babies will be females. There may be 5 - 10 generations or more per year. In the fall, a generation with winged males and females is produced. These migrate back to overwintering hosts, mate and lay eggs.

Aphids are usually held in check by natural enemies (lady beetles, hover fly larvae, lacewing larvae, tiny wasps and fungal diseases). Unfortunately, insecticide or fungicide sprays can sometimes disrupt this natural control and result in aphid outbreaks. Insecticides can be used to control aphids, but may not prevent the transmission of virus diseases. Aphids can be monitored by looking at the undersides of leaves in several locations in the field.

Flea beetles (fig. 9)(1/16 - 1/8-inch long, black or brown) chew small holes in foliage and can injure young transplants. Flea beetles have large hind legs and jump when disturbed. Adults overwinter in the soil and emerge early in the spring to feed and lay eggs. Larvae feed on plant roots but do not cause significant damage to tomatoes, eggplant or peppers. Flea beetles can be monitored by looking closely at foliage.

Hornworms (fig. 10) (4 inches or longer at maturity) can rapidly defoliate tomato, eggplant or peppers. They also feed on tomato fruit. Hornworms overwinter as pupae in the soil and emerge as adult hawk moths in May or June. Eggs are light green and laid singly on the underside of foliage. Larvae feed for 3 to 4 weeks before entering the soil to pupate. There may be 2 - 3 generations per year in Michigan. Hornworms are commonly attacked by wasp parasitoids and the white wasp cocoons are often seen on the larvae. Parasitized hornworms do not survive to become adults but continue to feed during the larval stage. Hornworms are well camouflaged and difficult to see on the plants. Look closely for eggs and larvae, chewed leaves and droppings on the ground underneath the plants. They can be easily controlled by hand picking if only a few plants are infested, or with insecticides.

Tomato fruitworms (also called corn earworms) do not overwinter in Michigan. The moths (fig. 11) migrate in from the south as early as June or as late as September. Sweet corn is most commonly attacked, but damage can occur to tomatoes (fig. 12). Eggplant (fig. 13) or peppers are rarely attacked. Eggs are laid singly on the underside of the leaves. One larva may feed on several fruit. Tomato fruitworm moths can be monitored using pheromone (sex attractant) lures and traps.

European corn borers are extremely serious pests of peppers, but rarely attack tomatoes or eggplant. They overwinter as larvae primarily in field corn crop residue. Moths (fig. 14) mate in grassy and weedy areas and lay egg masses (fig. 15) on corn, peppers, snap beans, and sometimes other crops and weeds. Eggs are usually laid on the undersides of the leaves. They most often attack field corn during the first generation. Second generation egg laying usually occurs in late July to August. A third generation of corn borers may occur in southern parts of the state or during years with unusually warm weather. In peppers, larvae usually enter the pepper near the cap or other rough area of the fruit (fig. 16). European corn borer eggs and larvae can be monitored visually, but preventive insecticide treatment is usually required as soon as fruit begin to form. Moth activity can be monitored using pheromone (sex attractant) lures and traps placed in grassy areas or with black-light traps.

Cabbage loopers (not shown) can feed on tomato foliage and form cocoons on the fruit. The cocoons are difficult to wash off. Loopers can be monitored visually and controlled before pupation, if necessary, to maintain product quality. **Variegated cutworms** can cause foliar and fruit injury to tomatoes during mid- to late summer.

For insecticide recommendations, commercial growers should consult MSU Extension bulletin E-312, *Control of Insects, Diseases and Nematodes on Commercial Vegetables.* Home gardeners, consult bulletin HYG-001, *Home Insect Pest Management Guide.*

Thanks to Art Wells and Don Cress for their contributions to earlier versions of this bulletin.

10M - 7:93 - TCM - HP - major revision, destroy previous editions. Price 25¢, single copy free to Michigan residents. File 27.34 (Pests).

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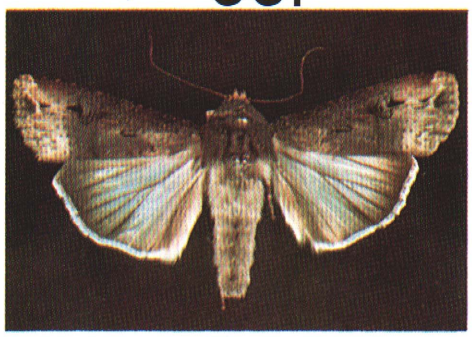


Black cutworm (1) left, above: larva; (2) left, below: pupae; (3) right: adult

4. Colorado potato beetle

5. Colorado potato beetle eggs

6. Colorado potato beetle larva

7. Green peach aphids

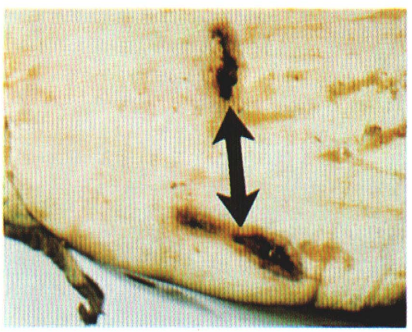
8. Mosaic disease in peppers

9. Flea beetle adult (inset) and damage

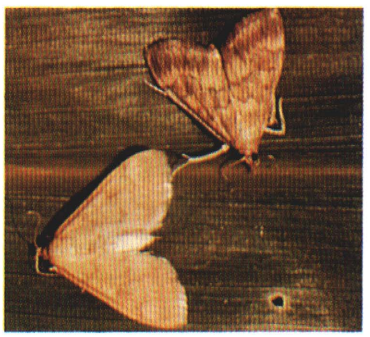
10. Tomato hornworm (left); tobacco hornworm (right)

11. Tomato fruitworm adult

12. Tomato fruitworm larva

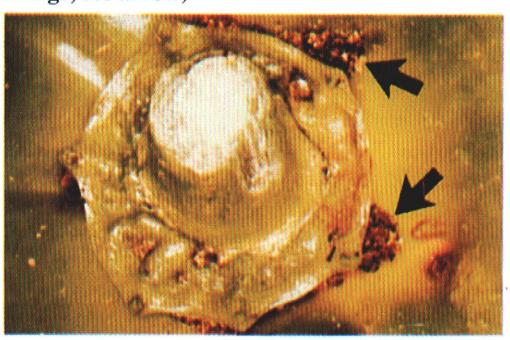


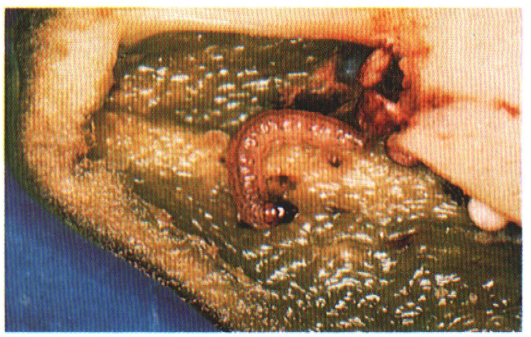
13. Eggplant damaged by tomato fruitworm (left: entry hole; right internal damage, see arrow)



14. European corn borer adults

15. European corn borer egg mass on pepper leaf





16. European corn borer damage to peppers (left: sites of entry around cap; right; internal damage and larva)