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Tomato Insect IPM Guidelines

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Fresh market tomato acreage has been gradually increasing in Kentucky during the past few years. Growing a new crop often means dealing with a different pest complex. Fortunately, insect problems on tomatoes in Kentucky are light to moderate when compared with that in other production areas. This publication provides information on the biology, identification and integrated pest management (IPM) guidelines of tomato pests. Specific information on insecticides is available from ID-36, Commercial Vegetable Crops Recommendations.

EARLY SEASON PESTS

Flea beetle

As soon as the plants are set, they are vulnerable to attack by two species of flea beetles, the tobacco and potato flea beetles. The potato flea beetle is about 1/10 inch and brownish black in color. The tobacco flea beetle is about the same size, but is yellowish brown with a dark band across its wings.

Figure 1. Flea beetle damage to tomato seedling.

These beetles infest solanaceous crops such as tobacco, potato, tomato, and pepper. Flea beetles attack the foliage leaving small round holes in the leaves; large numbers may destroy entire leaves. Potentially they can be serious pests early in the season when the plants are less than 4 to 6 inches tall. As they grow, larger plants can withstand substantial flea beetle damage without loss of yield.

Aphids

In the early spring, winged aphids migrate into tomato fields from wild hosts and begin to establish colonies on the plants. Two species of aphids are common on tomatoes, the potato and green peach aphids.

Figure 2. Potato aphid is a common aphid pest of tomato.

Although similar in size, about 1/8 inch, these aphids vary in appearance. The potato aphid is pear-shaped and may be solid pink, green and pink mottled, or light green with a dark stripe. It has a long slender pair of tail-like appendages (cornicles). The green peach aphid is pear shaped and pale yellow to green in color. The cornicles are much shorter on this species.

Aphids remove sap from the plant with their piercing-sucking mouthparts. Tomato plants can tolerate large numbers of aphids without suffering yield loss. However, severe

infestations can cause leaves to curl and may stunt plants. Decreased leaf area can increase sun scald to the fruit. Aphids are also vectors of certain plant viruses. However, there are many predators and parasitoids that can aid in controlling aphid populations. These include lady beetles, syrphid fly larvae, damsel bugs, and tiny wasps.

Colorado potato beetle

Colorado potato beetle is an infrequent pest of newly set tomato plants. The half inch, convex beetle is yellowish black with 10 black stripes on its wings.

Figure 3. Adult Colorado potato beetle.

Adults that have overwintered in the soil emerge and migrate into tomato fields and frequently begin their feeding on field margins. The adult and larva feed on the leaves and terminal growth of tomato plants, but typically only cause serious damage to young plants. Once plants reach eight inches, adult or larval feeding, regardless of the apparent severity of damage, does not reduce fruit yield.

INSECT PESTS DURING FRUIT SET TO HARVEST

Tomato Fruitworm

Tomato fruitworm is potentially the most damaging insect pest of tomato. The larvae are variable in color, ranging from pale yellow, to red, to green, to brown with pale stripes running lengthwise. The larvae have four pairs of prolegs and are densely covered with microscopic spines that makes the larvae feel rough.

The moths lay eggs at night on leaves near green fruit at the outer edges of the plant. The dome-shaped eggs are white when first laid and develop a reddish brown band before hatching. After the egg hatches, the larva feed for a short period of time on the foliage before attacking the fruit. They prefer to feed on green fruit and usually do not enter ripe fruit. Damage consists of deep watery cavities frequently in the stem end of the fruit. During its development, one larva may injure several fruit.

Figure 4. Tomato fruitworm is also known as the corn earworm.

The tomato fruitworm has a wide host range and the attractiveness of tomatoes for egg laying vary with the time of year. Early fruitworm generations attack corn, particularly when it is silking. But tomatoes are preferred for egg laying over corn when the silks turn brown and dry.

Stink bugs

Stink bugs have a distinctive shield shape and produce an odor when handled. There are several species of stink bugs that feed on tomato fruit, but the brown stink bug is the most serious. Stink bugs feed with piercing-sucking mouthparts which cause whitish-yellow corky spots underneath the skin of the fruit. This damage is serious for fresh market tomatoes and whole pack processing tomatoes because they render the fruit unmarketable.

Figure 5. Adult brown stink bug.

Adult stink bugs migrate from weedy areas into tomato fields, particularly when the plants begin to decline. On green fruit, stink bug damage appears as a pin prick, surrounded by a light discolored area. This may turn yellow or remain green on ripe fruit and the tissue below these spots is corky.

Figure 6. Stink bug damage to tomatoes appears as off-color patches under the skin.

Cabbage Looper

Cabbage looper can be common in tomato fields in Kentucky, but they rarely cause serious damage as they are foliage feeders rather than attacking the fruit. Because it does not feed in the fruit, it is only an indirect pest and relatively higher numbers can be tolerated.

Figure 7. Cabbage looper. Its name comes from the looping-motion as it crawls.

The cabbage looper larva is pale green with two pairs of prolegs in addition to the anal prolegs. They body is narrower at the head and widens toward the tail.

When large populations are present they can lower yields by reducing plant vigor and increasing sun scald of fruit through foliage loss. Typically, insecticides used to control tomato fruitworm keep cabbage looper under control.

Pest Monitoring

Groups of 10 plants should be randomly selected at each of a minimum of 4 locations per field. An additional 10 plant sample should be added for each 3-acre increase in field size over 5 acres. It is not necessary to sample more than 10 locations regardless of field size. Samples should be evenly distributed throughout the field so that plants near the edges and middle of the field are examined.

TOMATO INSECT IPM GUIDELINES			
Crop Stage: Transplanting through flowering			
Insect Pest	**What to look for:**	**How to sample:**	**Action Threshold:**
Flea beetles	small round holes in leaves, small brown beetles that jump	record the number of beetles per 10 plants at each location and estimate defoliation	Only when the plants are less than 6 inches and an average of 40 beetles per 10 plants or 30% defoliation.
Aphids	wingless aphids on the undersides of leaves and new in the new growth	Record the percentage of infested leaves. Only include leaves infested with wingless aphids	When 50% of the leaves become infested with wingless aphids regardless of plant stage
Colorado potato beetle	adult beetles or larvae on young plants	Record the number of adults per 10 plants at each location	An average of 5 beetles per 10 plants ONLY when the plant is less than 8 inches tall.
Crop Stage: Fruit set through harvest			
Insect Pest	**What to look for:**	**How to sample:**	**Action Threshold:**
Tomato Fruitworm (*KEY PEST*)	Damage fruit and larvae; eggs on the leaves near green fruit and at outer edges of plant (stop looking if any eggs are found); moths in pheromone trap.	Record number of damaged fruit and larvae; note any if any eggs were found on foliage; record number of moths in pheromone trap.	ONLY when the plants have green fruit and an average of 1 infested plant (larvae or fresh feeding damage) per 40 plants or when any eggs are present on foliage. Monitor for eggs carefully when trap catches exceed 7 moths per trap per week
Aphids	See above "Aphids -- Transplanting through flowering"		
Stink bugs	Adult stink bugs and damage to fruit	Record number of stink bugs per 10 plants at each location	ONLY when the plants have green fruit and an average of 0.25 stink bugs per 10 plants
Cabbage looper	Fecal pellets on leaves or below plant; looper larvae	Record number of cabbage looper larvae per 10 plants at each location	An average of 5 cabbage looper larvae per 10 plants at any plant stage