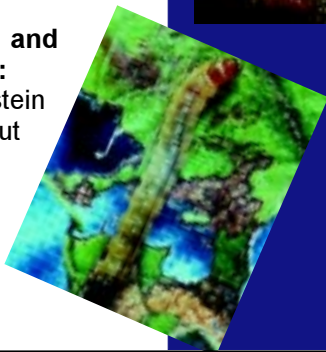


A Pocket Guide for IPM Scouting in Michigan Apples

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Obliquebanded leafroller -- *Choristoneura rosaceana* (Harris)

There are two complete generations per year in Michigan. Overwintering larvae feed inside bud clusters prior to bloom, begin feeding on fruit after petal fall, and mature in late May and June. Summer larvae are present from about late June into August. A degree day model can be used to predict larval activity periods.



Wings of the adult are banded with tan to brown scales. Adults are about 18-25 mm long.



Larvae are green with brown to black head capsules (about 25 mm long at maturity)

25 mm



Obliquebanded leafroller -- *continued*

Suggested monitoring and thresholds:

Check for overwintering survivors in terminals after petal fall. If larvae are found in more than 1-2% of the shoots, summer controls likely will be needed. Use one pheromone trap per 15 or 20 acres to set biofix and as an indicator of leafroller activity. Lures are highly attractive and generally last a generation. Traps tend to capture a lot of moths making it difficult to use them for decision making. However, a consistent catch of 20 plus moths for 2-3 weeks usually indicates a problem. Very low catches of less than 20 moths for an entire flight period generally means this pest is not present at problematic levels. See degree day table on next page.



At left, continuous feeding pattern of summer OBLR larvae. Below, an egg mass on a leaf.



Obliquebanded leafroller growing degree day table

GDD° Base 42 (Post Biofix) Tight cluster	Event	Action
0 GDD° = biofix (~900 GDD° after Jan 1)	1 st sustained moth captures emerged from shelters	Set GDD° = 0 Examine fruit buds for larval activity
220-250 GDD°	Peak moth flight - overwintering generation	
400-450 GDD°	Start of egg hatch	Timing for treatment
1000 GDD°	End of egg hatch	
2300 GDD°	Peak moth flight - 2 nd generation	
2750 GDD°	Start of 2 nd generation egg hatch	Timing for treatment

Twospotted spider mite -- *Tetranychus urticae* (Koch)



Twospotted spider mites (TSSM) have 2 distinct spots located on the front half of the dorsum behind the eyes. Males are much smaller than females, and have a distinctly pointed abdomen. Color can vary from pale yellow to green. The overwintering

adults turn orange in September. TSSM can be found in the tree canopy from tight cluster through harvest. They typically construct webbing on the underside of leaves.

Monitoring and thresholds (ERM & TSSM):

For summer populations of both mite species, examine leaves from several locations in the orchard using 50% spur leaves, 50% shoot leaves. Treat based on the following thresholds:

- 2-3 mites/leaf from petal fall to mid-June
- 5-7 mites/leaf from mid-June through July
- 10-15 mites/leaf in August

Presence of predaceous mites (>1/leaf) may justify delaying a treatment and repeating the cycle the following week.

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Sooty blotch and flyspeck

Sooty blotch and flyspeck are fungal diseases that frequently occur together on apple fruit. Flyspeck appears as groups of small, shiny, black dots on the fruit surface. Sooty blotch appears as greenish irregular blotches or patches on the fruit surface. Individual blotches can grow together to form larger infected areas. Both diseases develop best under moist conditions (frequent rainfall and high humidity). They infect fruit from after petal fall through late summer. Optimizing air circulation around fruit by pruning the tree canopy and thinning fruit clusters can reduce incidence and severity of both diseases. Reduce inoculum by removing reservoir hosts, such as brambles, in and around the orchard.

(Jones and Sutton, *Diseases of Tree Fruits in the East*, MSU Extension NCR45).



Left, sooty blotch and below, flyspeck on Golden Delicious

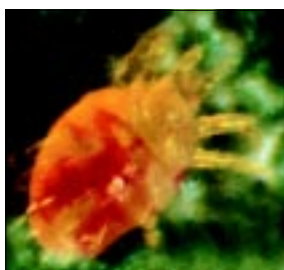


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About beneficials

Resident beneficial organisms (or natural enemies) can enhance control of many pest arthropods, often providing good suppression of many indirect pests (aphids, mites, and leafminers). The best way to conserve these beneficials is to use caution when selecting insecticides and timing applications. Beneficials are often more susceptible to broad-spectrum insecticides (organophosphates, carbamates and pyrethroids) than are the pests they attack. The availability of flowering plants within the orchard can also help conserve beneficials, since the adult stage of many predators and parasites feeds on nectar and pollen.

Beneficials -- predatory mites



Zetzellia mali has some tolerance for organophosphate and carbamate (Sevin) insecticides, but is susceptible to endosulfan (thiodan).

Z. mali are bright yellow with orange markings and a somewhat pointed posterior.

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Beneficials -- predators of soft-bodied insects

Green lacewing

adults (10-12 mm long) have large, net-veined wings and gold-colored eyes. They feed on nectar, pollen, and aphid honeydew.



12 mm



Lacewing larvae (about 15 mm long) are alligator-shaped with long sickle-like mandibles. They are active predators.

15 mm



Lacewing eggs are suspended at the tips of long, erect stalks.

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