Berry Insect Pests in Michigan

- Tarnished plant bug
- Strawberry clipper
- Potato leafhopper
- Meadow spittlebug
- White grubs
- Root weevils
- Two spotted spider mite
- Sap beetle
Tarnished plant bug
*Lygus lineolaris*

- Native insect, feeds on weeds and crops
- Common mustard weed is a preferred host
- Highly mobile, follows flowering plants

- Active April/May – first frost
- Activity during bloom is most damaging
- Cold, rainy or windy weather reduces damage
- Edge of fields have greatest injury

- Egg laid in blossom buds of crops and weeds
- Fruits may have feeding and egg-laying injury
- Feeding on fruits kills cells leading to distortion of the fruit – catfacing/button berries
Strawberry clipper
*Anthonomus signatus*

- Small beetle (1/8-1/4”), copper body and long snout
- One generation per year

- Emerges in spring from overwintering pupae
- Moves into fields when max. temp above 60°F
- Chews a hole in a flower bud and lays an egg.
- Then girdles the stem below the bud

- Greater injury at field margins
- Can cause economic injury if populations are high
- Many cultivars can compensate for clipper injury
  (Cornell studies. English-Loeb, 199)
Potato leafhopper
*Empoasca fabae*

- Flies into the Midwest from the south
- Rapid increase during storms

- Most varieties are susceptible
- Leafhoppers inject saliva during feeding
- Feeding causes leaves to curl
- Young plantings are at greatest risk

- Multiple ‘inversions’ can make it difficult to control
- Regular scouting needed to detect adults/nymphs
- Check undersides of leaves and stems
Meadow Spittlebug
*Philaeinus spumarius*

**Life Cycle**
- Overwinters in egg stage - white, 1mm long attached to leaf stems and leaves.
- Tiny yellow nymphs hatch in April and secrete a white froth over their feeding place on new growth.
- Nymphs suck juices from leaves and fruit spurs
- Causes distortion and stunting
- Injury results in reduced yield and inferior fruit

- Treatment before nymphs are half grown is most effective
- End of season sprays in heavily infested (50-100/plant) fields
Meadow Spittlebug
*Philaenus spumarius*

**Damage**
- Reduced plant vigor, stunting, and decreased yield
- Early-season feeding looks like that caused by cyclamen mite

**Thresholds**
- When the U-Pickers start complaining!!
- Usually >1 spittle mass per sq. foot of canopy

**Cultural Control**
- Weed control can contribute to spittlebug management
- Heavy rains or overhead irrigation can wash froth from plants
Two-spotted spider mite
*Tetranychus urticae*

**Biology**
- Adult TSSM are 1/50-inch long, with 8 legs.
- Yellowish-white with two large dark spots.
- Overwinter under vegetation and activity starts when temperatures rise.
- Many generations develop each season.
- Adults disperse by "ballooning" in the wind.

**Impact**
- Feed on plant sap by rasping and sucking on leaf surfaces.
- Causes mottling, speckling, or bronzing of foliage.
- Affect plant vigor and yield.
- Infestations in most strawberry fields do not reach densities high enough to warrant miticides.
Root-feeding grubs

White grubs: Phyllophaga species, Japanese beetle, European chafer

- Overwinter as white C-shaped grub
- Feed on roots of strawberry (and other plants)
- Emerge as beetles, June-July
- Some beetles are nocturnal

Root weevils: Black vine, strawberry root, rough strawberry root weevils

- Overwinter in soil as a smaller white grub
- Grubs feed on roots and adults notch leaves
- Difficult to control - pre-plant Lorsban (2 qt)
- Sevin after harvest when notching detected

Avoid grassy, weedy plantings.
Dig plants to inspect for grubs in spring, identify adults – MSU Extension
Two-spotted spider mite
*Tetranychus urticae*

**Cultural Control**
- Annual renovation of strawberry beds

**Monitoring and Thresholds**
- Take your first samples in any spots with bronzing
- Collect and examine 60 leaflets per field (zig-zag pattern). Record on a map.
- Over 25% of the leaflets (15/60) with mites is the damage threshold.

- 1 predatory mite: 10 TSSM gives adequate biological control.

**Chemical Control**
- Most miticides do not kill eggs, so if eggs and mobile mites are present, a second application may be needed a week later.
**Neoseiulus (=Amblyseius) fallacies**

Efficient predator  
Preference for TSSM and ERM  
High winter mortality  
Rapid reproduction (40-60 eggs)  
Leaves plants if food runs out

Time to establish effective predators

**Galendromus (=Typhlodromus) pyri**

Common in cooler regions  
Prefers ERM, but will feed on TSSM  
High winter mortality  
When pest mites absent, uses alternate food
Predatory mites

100% of samples from strawberry identified as:
*Neoseiulus (=Amblyseius) fallacies*
Mite management in strawberry

• Scouting is essential for accurate management decisions

• Broad-spectrum acaricides kill mites quickly

• Pest mites rebound if treatments kill predators

• Selective acaricides may take time to act

• Predatory mites protected by selective acaricides

• If treatment is warranted, combination of selective acaricide and predators provides sustainable control of pest mite outbreaks
Strawberry Sap Beetle  
*Stelidota geminata*

- **Adult:** small, oval, brown and slightly mottled beetle less than 1/8 inch long.

- **Eggs:** Small and whitish, laid singly on fruit. Hatch in 2-3 days.

- **Larva:** Mature larvae are 1/8 to 3/8 inch long depending on species. Creamy, white larva has a stout body with 3 pairs of short legs near the front.

- **Pupae:** Brown pupae are found just under the soil surface.
Strawberry Sap Beetle
*Stelidota geminata*

- Attracted from woods as berries begin to ripen.
- Attack ripe, diseased or damaged fruit by chewing.
- Chew on berries, often in groups. Drop when disturbed.
- Injury is primarily direct, but they also spread rots to nondiseased fruit. Similar to slug damage.
- Larval feeding is less obvious, but is a concern to consumers
New insecticides in berry production

• Increasing number of new insecticides and miticides
• Different modes of action, different use patterns
• Insects may not die immediately
• Need to know pest spectrum, properties to get the best activity
• Generally safer to workers, pickers
• More selective, more compatible with natural enemies
• Some are registered for organic production
• Generally more expensive
Integrating new tools into insect and mite management

- Maintain regular scouting, and application only when needed
- If possible, compare new product to standard
- Treat part of a field with the new product
- Have areas side by side in a field
- Apply at optimal timing, with good coverage
- Count insects and their damage
- Compare yields
- Be patient - effects may not be immediate
- Build experience over time
Strawberry and Caneberry Management Guide

- Publication E-154
- Updated annually with new labels and restrictions
- Describes properties of insecticides, fungicides, and herbicides
- Berry disease susceptibility ratings
- Available from MSU Extension (517) 353-6740