

Key Management Tactics for Caneberry Insect Pests



Diane Alston

Utah State University Extension

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Key Caneberry Pests in Utah

- Cane borers

- Raspberry horntail (wasp)
- Rose stem girdler (beetle)
- Raspberry crown borer (moth)

- Spider mites

- Stink bugs

- Aphids



Raspberry horntail larva tunnels in cane pith



Rose stem girdler adult lays eggs on canes

Key Management Tactics

■ Cane borers

- Pruning, pruning, pruning - prune out infested canes frequently & continuously
- Insecticides when needed
 - Timing and placement
 - Horntail & Girdler - Spring cane cover spray
 - Crown borer - Fall base drench

■ Spider mites

- Prevent stress, add moisture
- Weed management
- Miticides if necessary



Prune off tops



Prune out entire cane

Raspberry Horntail

- Most common insect pest of raspberry canes in northern Utah
- Hymenoptera: Cephidae
Stem sawfly, Wood wasp
- Beginning in April - May, female horntails insert their eggs under the epidermis of raspberry & blackberry canes, about 2 inches below the tips
- Hatched larva tunnels down the cane



Raspberry horntail female (1/2 - 3/4" long)



Raspberry horntail larva tunnels in pith

Raspberry Horntail

- Wilted tips of canes
- Infest vegetative canes/tender growth
- Larva has short spine on tail end
- Larva grows up to 1 inch long



John Davidson

Mature horntail larva



UC Statewide IPM Project
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Wilted cane tip

Raspberry Horntail

- Larva burrows down the pith in canes to spend the winter in a silk-lined cocoon
- Pupate in spring
- Adults emerge in spring
- 1-2 generations per year



Horntail injury in cane showing tunneling, darkening of pith, and brown insect frass



Raspberry Horntail Management

- Prune off infested tips/canes when first observed
- Destroy infested canes (burn, chip, bury > 2 in. deep, landfill)
- Two years of intense pruning has shown good reductions in infested canes
- Biological control: natural parasitic wasps (Ichneumonid wasp) – smaller white larvae crawling on horntail larva – summer

Raspberry Horntail Management

- Insecticides applied as full cover spray to canes in April and May (Do not spray during bloom to avoid killing pollinators; Apply late evening/early morning when bees are not foraging)
 - Carbaryl (Sevin)
 - Diazinon
 - Malathion
 - Bifenthrin (Capture)
 - Esfenvalerate (Asana)
 - Organic insecticides: rotenone, neem oil
 - Guthion - no longer labeled on caneberries
- Repeat application 7-14 days later if populations are high
- Difficult to prevent adults from laying eggs; need to have active residue on canes



Rose Stem Girdler

- Flatheaded beetle (Coleoptera: Buprestidae)
- Adult – Greenish-Bronze, shiny beetle
- Larva – flattened area behind head, 2 short brown projections on tail end
- Spiral grooves in cambium; swollen area
- Girdle canes



Adult rose stem girdler



Flatheaded larva



Spiral grooves in cane

Rose Stem Girdler

- Girdling causes canes to wilt and they may die
- Girdling in 1st year canes produces gall-like swelling
- In everbearing & varieties with extremely succulent 1st year growth, injury is worse in 1st year canes
- Varieties with more restricted vegetative growth are attacked primarily in the 2nd year
- Attacks to 2nd year canes has greater impact on fruit production



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Swollen
cane

Rose Stem Girdler

- 1 generation per year
- Winter is spent as mature larva within the pith of cane
- Pupate in the spring
- Adults emerge, mate, and lay eggs on canes in May
- Larva chews directly into cambium thru the bottom of egg



Flatheaded
larva tunneling
in cane pith

Stem Girdler Management

- Same as for Raspberry Horntail
- Prune canes below injury as soon as it is noticed; destroy canes; multiple years of pruning may be necessary to clean up infestation
- Insecticides – same timing & chemicals as for horntail
- Insecticides are more effective for stem girdler than horntail because eggs are laid on exterior of canes

Female lay eggs
on surface of canes



Raspberry Crown Borer

- Clearwinged moth
Lepidoptera: Sesiidae
- 2-yr life cycle
- Foliage on canes wilts & dies
- Shepherds crook; canes break at ground
- Canes predisposed to winter injury



Adult is a thick-bodied moth that resemble a wasp

Entire canes die back



Early injury resembles that of the horntail

Raspberry Crown Borer

- 2 year life cycle
- Eggs laid on underside of leaves in summer & early fall
- Larva crawls down to crown of cane & burrows under bark to over winter
- Following spring, larva feeds in crown & upper roots
- Next spring, larva tunnels up cane pith, pupate, & adults emerge in mid to late summer
- Pupal skins can be seen on canes



Egg laid on leaf



Crown borer larvae tunnel in crowns & upper roots

Crown Borer Management

- Prune & remove wilted canes in June & July; remove crowns
- Full cane and base drench with insecticide
 - September to mid-October targets young larvae crawling down canes to enter crowns
 - April - May targets larvae as they begin to feed in the spring
 - Irrigate (or rainfall) to move insecticide into root zone
- \geq 2 consecutive years of treatment
- Same insecticides as for other cane borers



Target young larvae before they start substantial boring

Spider Mites

- Two spotted spider mite
- Hot, dry weather conditions promote rapid population increase
- Injury to leaves appears as speckling, russeting, brown spots
- Webbing
- Dirty



TSSM



Speckling injury



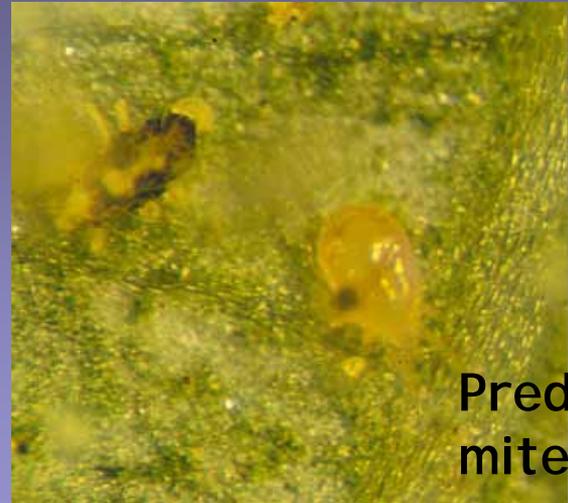
Russeting, brown spots

Spider Mite Management

- Scout frequently as daily temperatures exceed 80°F
- Check undersides of leaves, tap leaves onto light surface
- If catch the infestation early, can use softer controls
- Native predatory mites



Leaf with mite webbing



Predatory mite

Spider Mite Management

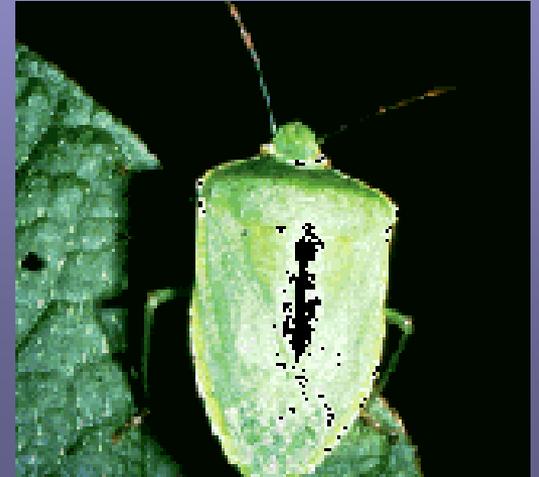
- Overhead irrigation, rain, wash down with a hose
- Ground cover, weed management
- Miticides
 - Horticultural oil (1%) – 2 to 3 apps.
 - Insecticidal soap – 2-3 apps.
 - Savey – apply early in mite pop. build-up, kills eggs, mite growth inhibitor, translaminar activity (local systemic)
 - Vendex – one application per season (resistance)
 - Bifenthrin (Brigade or Capture) – do not use more than 2x per season (resistance), toxic to predatory mites



TSSM adults
& eggs

Stink bugs

- Large, bright green bugs (adult)
- Shield-shaped, flattened
- Produce a bad smell, contaminate berries at harvest
- Hand pick, remove
- Effective insecticides (only if infestation warrants it)
 - esfenvalerate (Asana)
 - bifenthrin (Capture)



Consperse stink bug



Say stink bug

Vectors of Viruses

- Raspberry Mosaic

- Aphid (*Amphorophora agathonica*)



- Leaf Curl

- Aphid (*Aphis rubicola*)



- Bushy Dwarf

- Pollen / Bees

- Tomato Ringspot

- Nematode (*Xiphinema*)

