Key Management Tactics for Caneberry Insect Pests





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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

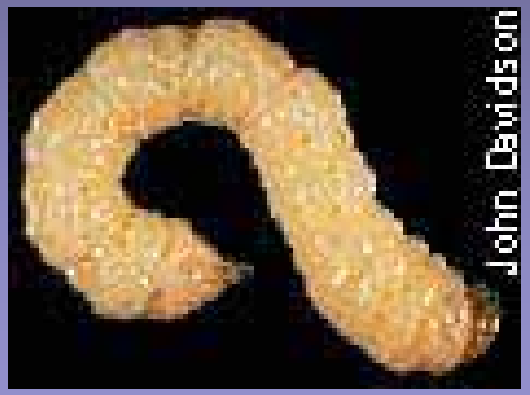
Raspberry horntail female (1/2 – ¾" long

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

Wilted cane tip



Mature horntail larva

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

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

Early injury resembles that of the horntail

Entire canes die back

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
- ≥ 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

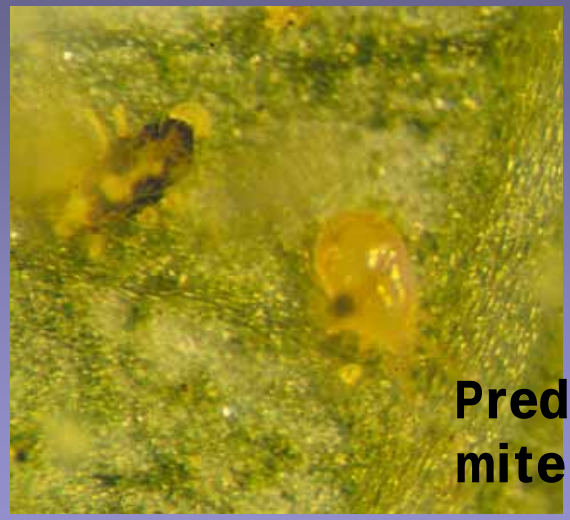
Speckling injury

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

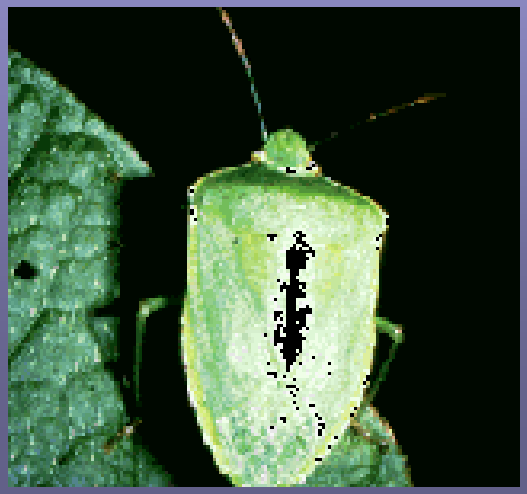
Spider Mite Management

- 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*)