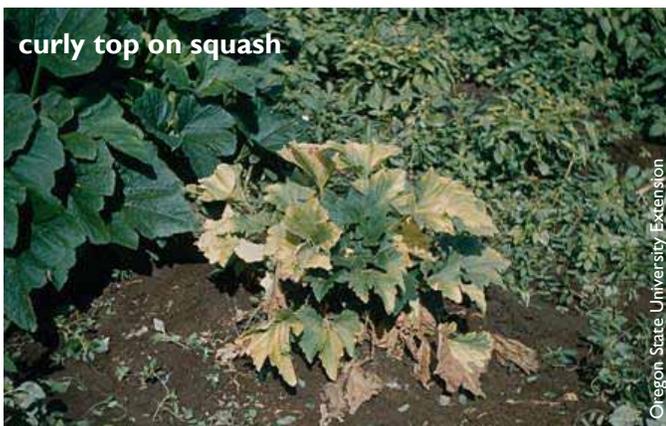


Insect/Disease Information

VEGETABLES

Beet Leafhopper and Curly Top Virus



The beet leafhopper carries the virus, curly top, which can affect many vegetables, including beets, beans, tomatoes, spinach, and melons. The leafhopper is an important pest only due to the fact that it vectors the virus; feeding alone does not cause severe damage. Beet leafhopper overwinters as a mated female in weed hosts in southern Utah, and migrates or is blown to other parts of the state in early summer.

Curly top can be a devastating disease, because it survives in a wide range of weed hosts, is easily spread, and difficult to manage. The leafhopper picks up the virus while feeding on infected weeds in spring. When weeds dry down, the leafhop-



per migrates to irrigated gardens and rangeland. A leafhopper can spread the virus from one plant to the next in 4 hours. A leafhopper can vector the virus for the duration of its life, but it does not pass on the virus to its progeny.

Symptoms vary according to the host plant, but in general, newly infected plants show inward or downward rolling of margins on the youngest leaves that is often associated with chlorosis, and plant drooping. Later, leaf curling and distortion increases, veins swell, and wart-like bumps appear on the undersides of leaves. Leaves are dark, thick, and brittle. The plant is stunted and eventually may die.

This disease is most often seen on tomatoes in Utah. Infected tomatoes will have chlorotic leaves with purple veins, and the plant will appear silvery in color. The leaves thicken and become leathery and brittle, and the blossoms may drop, preventing fruit set. Fruits that are already formed turn yellowish red, and ripen prematurely to a poor quality, stunted fruit.

Distribution of the disease from season to season varies, and depends on when leafhoppers leave overwintering sites in spring, percentage of leafhoppers carrying the virus, size and condition of susceptible plants at the time of infection, and weather conditions.

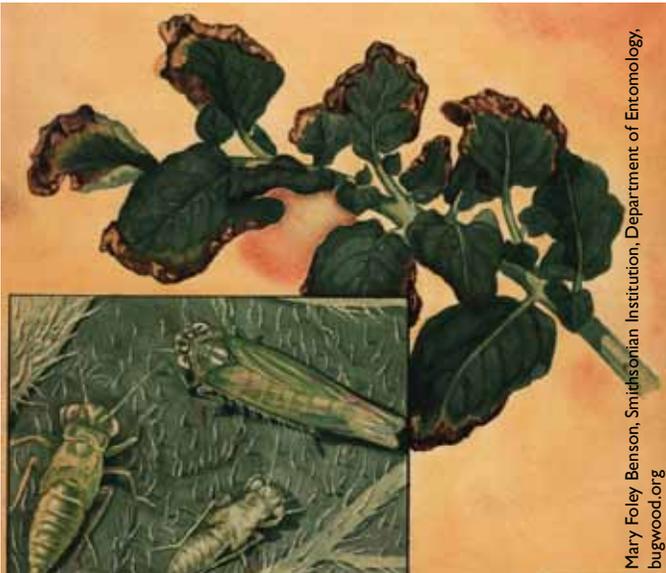
Treatment options:

- *Insecticides against beet leafhopper are not an option* because of the wide movement of the insect and the difficulty in determining when the leafhoppers are present.

Insect/Disease Activity continued from previous page

- Growers in areas that face continual virus infections should *plant varieties labeled as resistant*. Trials in southern Utah showed that the resistant labeled varieties Rowpac, Roza, Salad Master, and Colombian, fared well.
- *Plant at a higher than normal density* to lower the probability that every plant will be infected, allowing some plants to survive without decimating the entire field.
- Using *remay* (a white mesh fabric) over plants will prevent beet leafhopper feeding.

Potato Leafhoppers



Like beet leafhopper, potato leafhopper also overwinters in the southern part of the state and is blown north in wind currents. Potato leafhoppers feed on a variety of crops including beans, eggplant, and potato. Beans and eggplant can tolerate feeding but on potatoes, leaves are susceptible to scorch, also called hopper burn.

Watch hosts now for leafhopper infestations. Look on the undersides of leaves for small, pale green, wedge-shaped insects that fly away quickly when disturbed. The young, bright-green nymphs do not fly. Treat when you see 1 adult per 5 feet of row on tomatoes, and more than 2 adults per foot of row on beans. Once beans begin to bloom, they can tolerate feeding.

Treatment options: azadirachtin^H, Belay (clothianidin), carbaryl^H, horticultural oil^H, Lannate (methomyl), peppermint oil^H, rosemary oil^H, Vydate (oxamyl)

^Halso for homeowner use

Thrips on Peas, Tomato, others



Thrips are microscopic insects with a long, narrow body and fringed wings. Young nymphs are yellowish in color and do not have wings. They feed by scraping cells and sucking out the contents, causing the foliar tissue to turn white. As they feed, they leave behind dark droplets characteristic of this insect. Heavy feeding leaves a silvery cast to the leaves. Plants can usually tolerate moderate feeding.

Treatment: Assail/Ortho Max^H (acetamiprid), Radiant (spinetoram), Success (spinosad^H)

^Halso for homeowner use

Onion Thrips

Onion thrips thrive in hot, arid conditions, and their populations are slowly beginning to build, and they will cause the most damage in July. They overwinter as adults and start feeding in early spring on volunteer onions and new plantings. They are the most destructive pest of onions in Utah, not only for their heavy feeding, but because they vector the iris yellow spot virus.

Insect/Disease Activity continued from previous page

Feeding symptoms include whitish streaking of the foliage, plant wilting, and during July and August (when bulbs are rapidly enlarging), reduced bulb size due to loss of plant vigor.

Now is the time to scout fields/plants. Look on the newest leaves near the center of the onion neck, and count bodies. In the early season (until July), if more than 15 thrips/plant are found, treatments should be made to prevent later population build-up. In mid to late summer, treat when more than 30 thrips/plant are found.

To manage this pest, consider using a variety of options because onion thrips can quickly develop insecticide resistance. Heavy sprays of water (including overhead irrigation) will dislodge and drown the thrips. Also, applying straw mulch, and interplanting with carrots as an alternate host, can reduce thrips populations on onion.

Treatment: azadirachtin (Azatin, Neemix), spinosad (Success, Entrust, Green Light^H), spinetoram (Radiant), insecticidal soap^H, kaolin clay (Surround^H), carbaryl (Sevin^H), methomyl (Lannate), permethrin (Ambush, Pounce)

^Halso for homeowner use

BERRY CROPS**Grape Leafhopper**

The western grape leafhopper, which is building in numbers now, only feeds on leaves; it does not affect fruit. They damage the plant by extracting sap and chlorophyll, leaving behind white stippled areas. Usually feeding is clustered along veins. As populations increase, foliage may become speckled with dark excrement.

They overwinter as adults on weeds or groundcover near grape plants, and lay eggs on foliage in spring. A second generation begins in early July. The first generation of leafhoppers rarely needs treatment because they are feeding only on the lower leaves. For the second generation, grape plants can withstand a high population before treatment is necessary: an average of 20 nymphs per leaf.

Treatment: Applaud (buprofezin), Assail/Ortho Max (acetamiprid^H), insecticidal soap^H, Malathion^H, Surround (kaolin clay^H), Voliam Flexi (thiamethoxam plus chlorantraniliprole)

^Halso for homeowner use

Precautionary Statement: Utah State University Extension and its employees are not responsible for the use, misuse, or damage caused by application or misapplication of products or information mentioned in this document. All pesticides are labeled with ingredients, instructions, and risks. The pesticide applicator is legally responsible for proper use. USU makes no endorsement of the products listed herein.

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Editor: Marion Murray, marion.murray@usu.edu

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