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Southern Plant Diagnostic Network
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Arkansas Plant Health Clinic Newsletter

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Blackberry

Blackberry Anthracnose

Anthracnose, caused by *Elsinoe veneta*, can occur on leaves, petioles, pedicels, flower buds, fruit, and canes. Reddish-purple, circular to elliptical spots occur on primocanes in the spring. As the spots age, they enlarge and the centers become sunken, turning buff or ash gray with purple margins. The lesions may merge, forming irregular blotches that girdle the cane. The cane may crack and die at that spot. Tip dieback may occur. The first signs of infection on the leaves are minute purple spots which later develop white centers. The center of the holes may later drop out, giving a shot hole appearance. Infected fruit are small, pitted, and slow to ripen. Control measures include the avoidance of both excessive rates of nitrogen and overhead irrigation. Plants should be spaced and thinned for good air circulation. Weed control should be a priority as weeds reduce air movement in the planting. All pruned canes should be removed from the planting and destroyed as the fungus overwinters on both dead and live tissue. Liquid lime sulfur should be applied when the plants are breaking dormancy to when there is no more than 15mm of green tissue showing. Note that lime sulfur has become hard to obtain. Sulforix may be used instead. Captan, Pristine, and Switch are also labeled for anthracnose on blackberry.

For caneberries, such as blackberries, boysenberries, and raspberries, Sulforix can first be used in the early spring to treat for anthracnose. Use 3 gallons of Sulforix per 100 gallons of water. Apply it as a delayed dormant spray. It can be applied a second time at the much lower rate of 2 quarts of Sulforix per 100 gallons of water when the fruiting arms are about 1 foot long, but before the blossoms have opened. When the leaves turn color in the Autumn, Sulforix can be applied again at 3 gallons per 100 gallons of water.

This same method of Sulforix treatment can be used against Redberry Mites, Blackberry Mites, Leaf Spot, Cane Blight, and Yellow Rust. Blackberry Mites can also be sprayed for with a post-harvest treatment after the old canes are removed by using 3 gallons of Sulforix per 100 gallons of water.

Blackberry Anthracnose-*Elsinoe veneta*

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

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Blackberry Anthracnose-*Elsinoe veneta*

Photo by Sherri Sanders, University of Arkansas Cooperative Extension

Blackberry Redberry Mite

Redberry Mites belong to the Eriophyidae mite family. They are microscopic, carrot-shaped mites with two pairs of legs. They cause a condition known as Redberry where blackberry fruit infested with Redberry mites, *Acalitus essigi*, do not develop normally colored drupelets. The signs can be dramatic, with affected drupelets remaining hard with a green or bright red color while the rest of the drupelets on an affected berry ripen normally. Crop losses of more than 50% have been recorded. The damage results from a toxin injected by the mites while feeding. Traditionally, applications of sulfur or horticultural oils have been used for control. Oils cause less damage than sulfur. Apply horticultural oil after green fruit or first pink fruit stage in four consecutive applications spaced 2 or 3 weeks apart. For blackberry varieties that retain a leaf canopy through the winter, begin lime sulfur applications at bud break and continue at 3-week intervals up to 12 days before the start of harvest. Lime sulfur has become hard to obtain. Sulforix is labeled for blackberries and can be used both during dormancy and during the growing season. For blackberry varieties that naturally defoliate over the winter, apply lime sulfur before buds break dormancy and then not again until canes have a full leaf canopy, and first bloom appears (UC IPM recommendations).

Blackberry Redberry Mite-*Acalitus essigi*

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

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Blackberry Redberry Mite damage-*Acalitus essigi*

Photos by Sherri Sanders, University of Arkansas Cooperative Extension

Blackberry Cane Blight

Blackberry Cane Blight of blackberries and raspberries, caused by the fungus *Leptosphaeria coniothyrium*, can cause significant fruit loss. The fungus overwinters on dead tissue of old floricanes. Spores are produced from the spring through the fall. The fungus enters primocanes through wounds caused by poor pruning techniques, insect damage, freeze injury, herbicide injury, or storm damage. Once a cane is infected, the pathogen continues to spread under the epidermis during the fall and winter months. Symptoms usually appear after bloom and leaf emergence. Cane dieback of the fruit bearing canes is the most obvious symptom. Dark brown to purple cankers may be found on the affected canes. The cankers appear silvery white when sporulating. Canes may become brittle and break off easily. Spray during dormancy with Sulforix. Take great care when pruning not to injure adjacent canes. Avoid overhead irrigation. Any practices that reduce risk of splash dispersal of spores help. In cases of widespread damage in a planting, biennial cropping (alternate year bearing) in which no primocanes are present in the year in which fruit is picked helps to avoid the disease. High volume sprays of Pristine or Cabrio or Abound or Captan applied before, during, or immediately after harvest have given good control of cane blight.

Blackberry Cane Blight ascospores-*Leptosphaeria* sp.

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

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Blackberry Cane Blight-
Leptosphaeria coniothyrium

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Blackberry Cane Blight-
Leptosphaeria coniothyrium

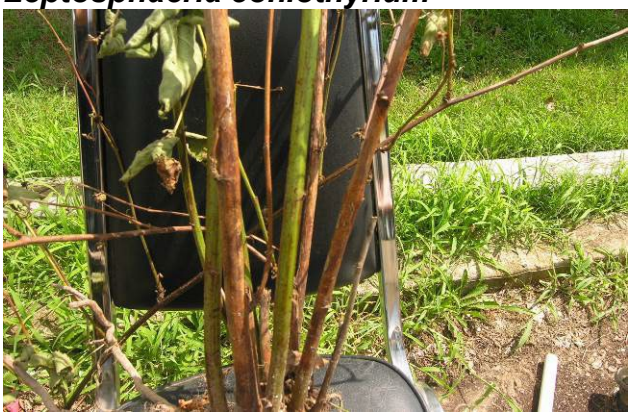

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Blackberry Spur Blight

Blackberry Spur Blight, caused by *Didymella applanata*, is a fungal disease that can attack both raspberry and blackberry, with raspberries being especially vulnerable. The disease can be devastating in overgrown and weed-infested plantings, particularly if excessive nitrogen has been applied. Brown, V-shaped lesions with broad, yellow margins occur on infected leaves of primocanes. The infection then spreads from the leaf into the petiole and into the node. Affected leaves are usually shed. A spreading, dark chestnut-brown lesion develops below the node and around axillary buds. Silver or gray lesions with small, black pseudothecia and later pycnidia develop during the winter. Cane botrytis causes similar symptoms on primocanes, but the lesions are light brown. It is not unusual to find plantings with Spur Blight problems to also have anthracnose, cane blight, and botrytis diseases as well. Diseased

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canes should be removed from the planting immediately. Lime sulfur applied during the dormant season is highly recommended. Cabrio, Abound, and Pristine are effective if used before the disease becomes severe. Healthy plantings are less susceptible.

Blackberry Spur Blight-*Didymella applanata*

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Blackberry Double Blossom

Rosette or Double Blossom, caused by the fungus *Cercosporella rubi*, is a serious disease of many cultivars of blackberries. Infections cause reduced yields, poor quality fruit, and cane death. Buds on primocanes become infected in early summer, but there are no symptoms until next spring. At that time, a proliferation (witches-broom) of shoots occurs at the infected bud site. These shoots are usually smaller than normal and have pale green foliage that later turns bronze. Unopened flower buds are elongated, coarser, and often redder than uninfected buds. Sepals enlarge and sometimes differentiate into leaves. The petals of unfolding flowers are usually pinkish, wrinkled, and twisted, having the appearance of a double bloom. Berries do not develop from infected flowers.

Double Blossom can be controlled in areas where it is not severe by using proper sanitation. To prevent dispersal of the spores, infected rosettes and blossom clusters should be removed before they open. Old floricanes should be removed and destroyed immediately after harvest. The removal of all wild blackberries and dewberries around the planting is also recommended. In areas where disease pressure is more severe, both primocanes and floricanes may be cut to the ground immediately after harvest. The primocanes are then allowed to regrow from buds at the base. Chemical control starts at first bloom. Abound, Cabrio, and Pristine are labeled for Double Blossom. Homeowners must rely on sanitation.

Blackberry Double Blossom-*Cercosporella rubi*

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

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Blackberry Double Blossom-
Cercosporella rubi

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Blackberry Double Blossom-
Cercosporella rubi

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Blackberry Rusts

Although early in the season, we are already seeing blackberries with rust. There are several types of rust found on blackberries, some minor and some serious. Orange rust, caused by the fungus *Gymnoconia nitensis*, is the most serious rust disease of blackberries. It is a systemic rust that can cause significant yield reduction. Symptoms appear as soon as new growth comes on in the spring. Young shoots are spindly and clustered, with misshapen, chlorotic, stunted leaves. Approximately 3 weeks later, the leaves become covered with bright, orange-colored rust pustules. Once infected, the plant is infected for life. Canes produced after infection don't produce fruit. Rogueing infected plants from within the planting and destroying nearby wild blackberries are the most effective methods of control. Good weed control and good air circulation also help reduce the number of new infections. Fungicides don't give adequate disease control but may reduce

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the number of new infections. Nova, Cabrio, and Pristine should be applied in the spring when the bright orange aeciospores are being produced and again in the fall as temperatures start to drop and teliospore infection becomes a threat.

Cane and leaf rust, caused by the fungus *Kuehneola uredines*, can cause defoliation and some fruit reduction in severe cases, but is not a systemic rust. It's usually only a minor problem. Symptoms are first seen in the spring on new floricanes. Large yellow uredia split the bark on infected canes, followed by small yellow uredia on undersides of leaves. Infected canes should be removed, and protective fungicides applied. Nova, Pristine, and Cabrio are effective. Several other blackberry rusts cause leave, petiole, and stem symptoms. The same controls should be used as for cane and leaf rust.

Blackberry Orange Rust-
Gymnoconia nitensis

Photo by Mitch Crow, formerly University of Arkansas Cooperative Extension

Blackberry Orange Rust-
Gymnoconia nitensis

Photo by Mitch Crow, formerly University of Arkansas Cooperative Extension

Blackberry Leaf Rust-*Kuehneola uredines*

Photo by Rick Cartwright, University of Arkansas Cooperative Extension

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Blackberry Downy Mildew

Downy Mildew of Caneberries, caused by the fungus Peronospora sparsa, can be devastating to susceptible cultivars. Symptoms during the growing season are small, irregularly shaped, somewhat angular lesions on upper leaf surfaces following leaf veins. The lesions are yellow in the beginning, changing to a deep reddish color with a brown margin. Stems and petioles may exhibit red streaking indicating a systemic infection. Downy mildew may also attack fruits, sepals, and pedicels, causing fruit to dry and shrivel. Peronospora overwinters in the plant roots, crowns, and canes. As new shoots emerge in the spring, the pathogen follows the growing point, infesting stems, and new leaves. Aliette and Fosphite are two of the products labeled for control.

Blackberry Downy Mildew-
Peronospora sparsa

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Blackberry Downy Mildew-
Peronospora sparsa

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Blackberry Crown Gall

Crown Gall is a serious disease of roots, stems, and crowns on a wide range of plants. Some of the most common hosts are apples, grapes, plums, roses, blackberries, raspberries, muscadines, hollies, euonymus, and numerous other trees and shrubs. Crown Gall is caused by the bacterium *Agrobacterium tumefaciens*. The bacteria enter through wounds made by insects, other animals, grafting, pruning, transplanting, and cultivation tools. Rough, knobby galls develop on the crown at the soil line. Lateral roots and support roots may also develop galls. Some aerial galls may develop

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on heavily infected plants. Newly formed galls are light tan-colored and soft. Older galls become hard, woody, and dark brown to black. Galls vary in size, from a few inches to more than a foot across. A few small galls do not seriously impact the plant. However, large numbers of galls can cause stunting, chlorosis, and eventual plant death. Infected plants in orchards and landscapes should be pulled up and destroyed. Care should be taken to avoid injury to plants when mowing or weed eating around them. Growing non-susceptible crops, such as grasses, for three years will nearly eliminate the bacterium from the soil.

Blackberry Crown Gall-*Agrobacterium tumefaciens*

Photo by Allen Bates, University of Arkansas Cooperative Extension

Crown Gall-*Agrobacterium tumefaciens*

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Blackberry Orange Felt

Blackberry Orange Felt or Orange Cane Blotch is caused by the alga *Cephaleuros virescens*. This organism has been reported as a pathogen of nearly 300 species of plants, causing stem spots or lesions as symptoms on 80 of these plant species. Initially, whitish-yellow disk-shaped spots appear on the canes, usually more prevalent near the base of the canes. Later in the season, the spots become orange and velvety in appearance. The orange pigmentation results from the production of reddish pigments by mature, spore-producing structures of the alga. Under wet humid conditions, the spots often merge, nearly covering the entire cane. Orange Felt may be seen on the canes from spring to fall but is more prevalent throughout summer and fall. Although the lesions themselves are superficial, they open the canes to infection by pathogenic fungi such as Botryosphaeria. The first line of defense in preventing or treating Orange Felt is to plant only in well-drained fields. Old floricanes should be removed

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immediately after harvest. Blackberries planted on plastic with drip irrigation have been shown to have fewer problems with Orange Felt. Since stressed plants are more susceptible to infection, care should be taken to ensure optimum growing conditions, with attention paid to pH and nutrients. Copper fungicides have been known to provide some control. Read labels carefully.

Blackberry Orange Felt-
Cephaleuros virescens

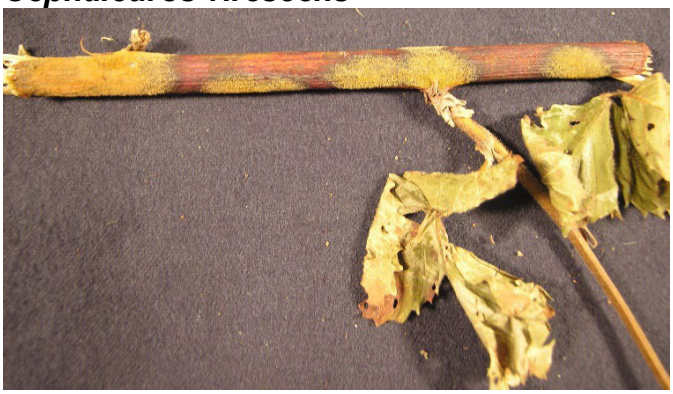

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Blackberry Septoria

Septoria leaf spot is a common and destructive disease in blackberry growing regions of the southeastern United States and the Pacific Northwest. It is usually a late season leaf disease that causes premature defoliation in late summer and fall, reducing plant vigor and increasing susceptibility to winter injury. The fungus, *Septoria rubi,* causes frogeye type lesions on the leaves. The lesions are roughly circular and tan to white with a purple margin. Small, black fruiting bodies may be seen in the center of the lesions. These leaf spots are larger than anthracnose spots and are generally seen later in the season than either anthracnose or Cercospora. In the South, a delayed dormant spray of lime sulfur followed by three sprays of Captan gives good control. Disease incidence is greatly reduced by following good cultural practices. Proper plant spacing, thinning to provide recommended cane density, and maintaining narrow rows are all helpful in controlling leaf spot diseases. The sooner old fruiting canes are removed after harvest, the better.

Blackberry Septoria Leaf Spot-
Septoria rubi

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Blackberry Fire Blight

Fire Blight, caused by the bacterium *Erwinia amylovora*, attacks all members of the rose family except for the stone fruits. Hosts include pears, apples, crabapples, quince, cotoneaster, pyracantha, photinia, raspberries, blackberries, hawthorn, spirea, and roses. Twig and branch cankers become active with warm, wet weather in the spring. The infected tissue begins to ooze bacterial

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slime that attracts bees. The bees carry the bacteria from bloom to bloom and from tree to tree. Bloom clusters wilt and die a few weeks after infection. Infection spreads down the twig and can infect a main branch. Twig and branch cankers begin as water-soaked areas and then turn dark brown or black. The bark covering older cankers usually becomes sunken and cracked. The disease can kill blossoms, leaves, twigs, limbs, and occasionally, the entire tree. Infected petioles and young shoots form a typical shepherd's crook. All dead tissue should be pruned out 10-12 inches below the damage. Cutting tools should be dipped between cuts in a 10% bleach solution (nine cups water to one cup bleach). Recommendations are slightly different for brambles because there are no registered products specifically for Fire Blight. Rely on sanitation.

Blackberry Fire Blight-*Erwinia amylovora*

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Blackberry White Drupelet

The Plant Health Clinic has received several complaints about discolored fruit in blackberries. White Drupelet is a tan to white discoloration of individual drupelets on blackberry or raspberry fruits. This condition is caused by UV radiation and appears when there has been an abrupt increase in temperatures accompanied by a drop in humidity, especially when wind is also present. Hot, dry air allows more direct UV rays to reach the fruit. Most varieties of blackberry and raspberry are susceptible to White Drupelet. However, Apache and Kiowa blackberries and the Caroline red raspberry seem to get the disorder more frequently. While White Drupelet does not make the fruit uneatable, it makes it unmarketable.

Blackberry White Drupelet-Abiotic

Photo by Richard Klerk, University of Arkansas Cooperative Extension

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Blackberry Raspberry Crown Borer

The Raspberry Crown Borer, *Pennisetia marginata,* is one of the most damaging pests of blackberries and raspberries. The adult is a clearwing moth, black with yellow stripes, that resembles a yellowjacket. It lays its eggs singly on the underside of leaves, near the edge, in late summer. The larvae migrate to the base of the stem, where they spend the winter just below the soil. In the spring, the larvae bore galleries in the crown. By the second summer of their 2-year life cycle, the crowns may be seriously damaged. An obvious symptom is when individual canes are wilted, withered, and bent over with dying or dead foliage. This commonly occurs when the fruit is about half-grown. Canes infested by the borer will break off easily when given a sharp tug. Borer damage will be obvious at the point of breakage. Digging the crown up and cutting it open will reveal galleries, larvae, and pupae. Commercial growers may apply Altacor, or Brigade 2EC, or Brigade WSB, or Hero at the base of canes in late October to early November. Follow label for rates. Homeowners have fewer options. Some states recommend drenching the crowns and the lower two feet of the canes with pyrethrins when blossom buds first appear through when flowers show white.

Blackberry Raspberry Crown Borer-*Pennisetia marginata*

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Blackberry Raspberry Crown Borer-*Pennisetia marginata*

Photo by Sherrie Smith, University of Arkansas Cooperative Extension

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Blackberry Raspberry Crown Borer-*Pennisetia marginata*

Photo by University of Georgia Plant Pathology, University of Georgia, Bugwood.org

Blackberry Spotted Wing Drosophila

The Spotted Wing Drosophila (SWD), *Drosophila suzukii*, is an Asian fly species that attacks ripening and ripe soft fruits. Fruits that are commonly attacked are Blackberry, blueberry, boysenberry, grape, raspberry, strawberry, apricot, cherry, mulberry, nectarine, peach, persimmon, plum, pluot, melon, and tomato. Yield loss can be devastating due to tunneling through the fruit by the larvae and secondary fungal infections caused by egg laying activity. Go to our publication on Spotted Fruit Fly for trapping and control recommendations.
https://www.uaex.uada.edu/publications/pdf/fsa-7079.pdf

Blackberry Viruses

There are numerous viruses associated with blackberries. Many plants acquire multiple viruses before yield is affected. Symptoms may include crumbliness or drupelet abortion, yellow line patterns, general chlorosis, and leaf distortion. There are no cures for virus infected plants. Information on the 29 confirmed blackberry viruses and their vectors are included at the end of this newsletter and comes from "Viruses and Virus Diseases of *Rubus*." by Robert R. Martin, Stuart MacFarlane, Sead Sabanadzovic, Diego Quito, Bindu Poudel, and Ioannis E. Tzanetakis from Plant Disease / Vol. 97 No. 2. Pages 168-182.

Blackberry Tobacco Ringspot Virus (TRSV)-*Nepovirus*

Photo by John Fisher, Ohio Department of Agriculture, Bugwood.org

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Blackberry Tobacco Ringspot Virus (TRSV)-Nepovirus

Photo by John Fisher, Ohio Department of Agriculture, Bugwood.org

This bulletin from the Cooperative Extension Plant Health Clinic (Plant Disease Clinic) is an electronic update about diseases and other problems observed in our lab each month. Input from everybody interested in plants is welcome and appreciated.

"This work is supported by the Crop Protection and Pest Management Program [grant no. 2017-70006-27279/project accession no. 1013890] from the USDA National Institute of Food and Agriculture."

Table of Blackberry Viruses

Virus name	Acronym	Mode of transmission	Genus
Apple mosaic	ApMV	Pollen, seed	Ilarvirus
Arabis mosaic	ArMV	Nematode, seed	Nepovirus
Beet pseudo yellows	BPYV	Whitefly	Crinivirus
Blackberry chlorotic ringspot	BCRV	Pollen, seed	Ilarvirus
Blackberry virus E	BVE		Unassigned
Blackberry virus S	BlVS		Marafivirus
Blackberry virus Y	BVY		Brambyvirus
Blackberry yellow vein-associated	BYVaV	Whitefly	Crinivirus
Black raspberry necrosis	BRNV	Aphid	Unassigned
Cherry leaf roll	CLRV	Nematode, pollen, seed	Nepovirus
Cherry rasp leaf	CRLV	Nematode	Cheravirus
Grapevine Syrah virus 1	GSyV-1		Marafivirus
Impatiens necrotic spot	INSV	Thrips	Tospovirus
Raspberry bushy dwarf	RBDV	Pollen, seed	Idaeovirus
Raspberry latent	RpLV	Aphid	Unassigned
Raspberry leaf blotch	RLBV	Mites	Emaravirus
Raspberry leaf curl	RpLCV	Aphid	No Info.
Raspberry leaf mottle	RLMV	Aphid	Closterovirus
Raspberry ringspot	RpRSV	Nematode, pollen, seed	Nepovirus
Raspberry vein chlorosis	RVCV	Aphid	Rhabdovirus
Rubus canadensis virus 1	RuCV-1		Foveavirus
Rubus yellow net	RYNV	Aphid	Badnavirus
Sowbane mosaic virus	SoMV	Pollen, seed	Sobemovirus
Strawberry latent ringspot	SLRSV	Nematode	Unassigned
Strawberry necrotic shock	SNSV	Thrips, pollen, seed	Ilarvirus
Tobacco ringspot	TRSV	Nematode, pollen, seed	Nepovirus
Tomato black ring	TBRV	Nematode, pollen, seed	Nepovirus
Tomato ringspot	ToRSV	Nematode, pollen, seed	Nepovirus
Wineberry latent/ Blackberry calico	WLV/ BCV	Unassigned	