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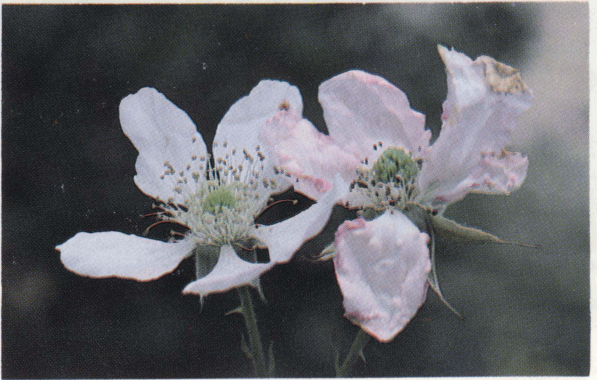
BLACKBERRY DISEASES AND THEIR CONTROL



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Orange rust disease.



Blossom infected with rosette fungus shown at right in photo above and on left in bottom photo.



Cover photo: Orange rust on "Humble" variety.

BLACKBERRY DISEASES AND THEIR CONTROL

George L. Philley and Leon R. Smith*

Blackberries and dewberries often are attacked by a variety of disease-producing organisms. The majority of these are fungi, but several species of nematodes and at least one virus may also weaken plants and reduce quality and yield of berries. The perennial nature of berry plants favors build-up of disease organisms over a period of time, so that the productive life of plantings often falls far short of expectations. An understanding of these diseases, the organisms that cause them and the conditions required for their development will help berry growers establish and maintain healthy, productive plants.

Crown Gall

Crown gall disease is caused by tumor-inciting bacteria present either in the soil at planting time or on propagative root cuttings. The disease can be recognized by the presence of galls or tumors on the roots or on the crowns either below or just above the soil line. Galls may range from pea-size or smaller up to several inches in diameter. Plants may be stunted or weakened by crown gall bacteria. This makes them susceptible to invasion by other soil organisms.

Control of crown gall depends almost entirely on planting gall-free blackberries in clean soil. Avoid planting at old berry sites or where other host plants such as rose or fruit trees have been established previously.

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Crown gall disease.

Nematodes

Several nematode species are parasitic to blackberries and dewberries. Soil populations of these parasites may increase considerably as plants age, resulting in dwarfed fruiting canes and smaller fruit. Damage generally is most severe in light, sandy soils. During hot summer months or under severe moisture stress, foliage of heavily infested plants may turn yellow and drop early.

A practical approach to nematode control in commercial fields and in home gardens consists of planting clean root cuttings in soil where only grasses or small grains have been allowed to grow for 3 to 4 years. In the absence of suitably clean land, soil may be treated with an approved pre-plant soil fumigant to reduce nematode populations to acceptable levels.

Anthracnose

Anthracnose, sometimes called dieback, is a common foliage and cane disease of blackberries and dewberries. The disease is first noticeable in the spring as small purplish spots on new shoots and as purple-bordered spots on leaves. As spots on canes enlarge, they become oval in shape and gradually turn gray. Badly infected canes dry out, crack, and cane tips die back. Leaf spots become white with age, and affected tissue frequently drops out leaving a shot-hole effect. The causal fungus also attacks fruit, resulting in small, dry, scabby berries. Certain berry varieties, such as Boysen, Young and Ness, are very susceptible to anthracnose; Brazos is moderately susceptible; and

erect types, such as Humble, Lawton and Cherokee, are least affected by the disease.

Anthracnose control on susceptible varieties is accomplished by a combination of cultural practices and chemical control. Before planting, destroy any old brambles in the immediate area. In humid areas where anthracnose is likely to cause greatest damage, tolerant or resistant varieties should be used.

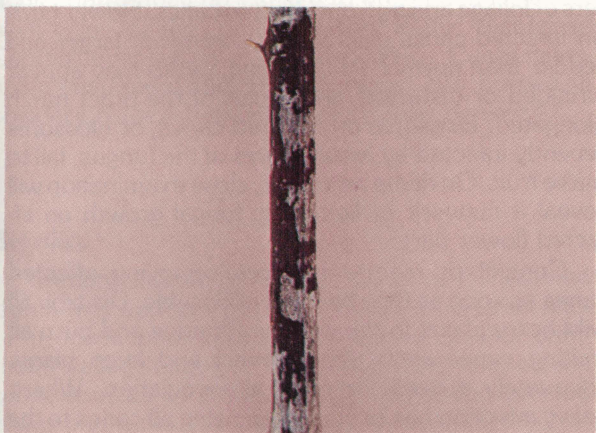
Plant at sites having good air movement, and space plants wide enough apart to permit good air circulation. For established plants, remove and burn all badly infested canes soon after harvest. Weed and grass growth in the row should be kept down for good air circulation around plants.

Chemical control of anthracnose on susceptible varieties involves three to four fungicide spray applications, beginning in early spring when leaf buds have swelled or are just beginning to open. Timing of the first application is very important in preventing later buildup of the causal fungus. Use Captan®, basic copper sulfate or lime sulfur, making sure all plant parts are covered thoroughly with spray material.

Orange Rust

Orange rust disease is caused by a fungus that moves systemically throughout infected plants, rendering them useless for future production. In commercial production fields of East Texas, it is most serious on the Humble blackberry.

This disease is recognized easily by the large masses of orange colored spores produced in the spring



Anthracnose cane lesions.

on the leaves of affected plants. As leaf expansion is completed in late March or early April, large orange pustules form on the undersides of leaves, often causing distortion and upward leaf rolling. The pustules rupture and release spores for a period of about 60 days. Rust symptoms then disappear, but foliage remains sickly in appearance. All new canes produced on affected plants will be non-productive.

Control of orange rust is limited to cultural practices that prevent spread of the disease and the use of resistant varieties. Remove all infested plants, including complete root systems, as soon as pustules become noticeable in the spring and before spores are released. Fungicidal sprays have not provided satisfactory control. Boysen, Eldorado, Lawton and Young varieties are resistant to orange rust disease. Brazos is practically immune.

Rosette

Rosette, also known as double-blossom or witch's broom, is another fungal disease that prevents normal fruit development. Both wild and cultivated blackberries and dewberries are susceptible. Observations made at the Overton Research and Extension Center indicate varieties differ in their susceptibility to rosette. Humble has high resistance, whereas Comanche and Cheyenne are very susceptible. Cherokee, Bryson and Womack are moderately susceptible. Brazos and Rosborough are moderately resistant. Varietal resistance may not be permanent because there have been recent reports of an increase in rosette on the Brazos variety in Southeast Texas.

Symptoms of rosette are short, broom-like clusters of foliage arising from infected canes. Flower buds on infected canes may appear somewhat larger and redder than normal. At flowering, petals may appear wrinkled or distorted, and sepals of the bract much elongated. Blossoms on infected canes, or blossoms recently infected by aerial spores of the fungus, fail to make fruit. On damp mornings, close examination will reveal a network of light gray fungal growth on affected flower parts.

Control of rosette requires removing affected canes as soon as they become noticeable. Destroy all wild berry plants in the vicinity. Remove and burn all fruiting canes soon after harvest and keep plants adequately spaced for good air circulation. Where heavy infection has occurred, mowing all canes to the ground may be necessary. Do this soon after har-



Rosette symptoms on "Brazos" variety.

vest to allow production of new canes for the next growing season. Fungicide sprays for anthracnose control may reduce rosette infection in humid areas. Benlate®, a fungicide recommended for fruit rots and powdery mildew, has also been effective in controlling rosette if sprayed regularly during the bloom period.

Minor Leaf and Cane Disorders

Leaf spots other than those caused by the anthracnose fungus, as well as cane spots and cane rust occasionally may develop in seasons of high humidity or when plants are spaced too closely. These diseases generally are of minor importance, and usually are most noticeable in late summer or fall. On rare occasions control may be justified to preserve foliage and plant vigor for the coming season. In this event, use Captan cover sprays at 10-day intervals. Canes developing rust spots should be removed and burned. If powdery mildew becomes serious, use Benlate®.

Sterility

Sterility disease is caused by a virus. Infected plants may appear vigorous, but either fail to set fruit or produce poor quality, few-seeded berries commonly called "nubbins." Wild blackberry thickets are prime sources of virus infection. Removing infected plants and roots and destroying wild brambles will reduce spread of the virus to healthy plants. Obtain

blackberry plants from reputable sources where sterility disease is not a problem.

Conclusion

Good cultural practices play an important role in blackberry disease control:

1. When possible, select varieties with resistance to diseases common in your area.
2. Examine roots before planting to ensure absence of crown gall.
3. Do not propagate cuttings from diseased plants.
4. Choose planting sites with good air circulation.
5. Destroy all wild berry plants and brambles in nearby fence rows or in the vicinity of the planting site.
6. After harvest, remove and burn the old fruit canes and any new canes that appear diseased.
7. Thin healthy canes for good air circulation, and prevent excessive weed growth in the rows.

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