



Blackberry Rosette (Double Blossom)

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IMPORTANCE

Blackberries are a favored fruit grown for both home and commercial production in Kentucky. A significant challenge, however, is the presence of several fungal diseases that require careful cultivar selection and management during the growing season. Blackberry rosette (FIGURE 1), also known as double blossom or witches' broom, is one of these diseases. In some locations, it is the most limiting factor to successful blackberry production because diseased plants produce very little fruit; heavily infected plants can weaken and die.

Blackberry rosette primarily affects upright, thorny blackberry cultivars, boysenberries, and only infrequently occurs on red and black raspberries. Thornless blackberries are much less likely to be affected.

SYMPTOMS

Growers scouting for symptoms should monitor plants in early spring, especially those that are 4 or more years old. Initial symptoms include side shoots with a proliferation of light green, stunted growth (FIGURES 2 & 3). This witches' broom symptom occurs on second-year canes (floricanes). Flower buds soon become elongated and colored deeper pink than those on healthy plants; petals appear crinkled and twisted as they unfold (FIGURE 1). Infected flowers are mostly sterile and produce little or no fruit (FIGURE 4). Sepals on infected flowers appear leafier than normal.



FIGURE 1. AFFECTED FLOWER BUDS ARE ELONGATED, AND EMERGING PETALS ARE TWISTED AND CRINKLED.



FIGURE 2

FIGURE 2. WITCHES' BROOM GROWTH EMERGES AS LIGHT GREEN BUSHY SIDE SHOOTS ON SECOND-YEAR CANES.



FIGURE 3

FIGURE 3. ABNORMAL LEAF DEVELOPMENT AND FLOWER FORMATION OCCUR ON FLORICANES.



FIGURE 4

FIGURE 4. INFECTED BLOSSOMS ARE GENERALLY STERILE AND DO NOT PRODUCE FRUIT.

CAUSE & DISEASE DEVELOPMENT

This fungal disease develops in sync with the blackberry plant's life cycle. The pathogen (*Cercospora rubi*) overwinters on first-year canes, and becomes active the following year when these canes grow and flower. Blackberry rosette is spread when spores released from infected flowers land on new first-year canes. Infection occurs from mid-spring through early summer. Blackberry rosette disease spreads through movement of infected nursery plants and via wind-borne spores from infected plantings or wild blackberry plants.

DISEASE MANAGEMENT

Blackberry rosette is managed using a combination of strategies such as avoidance, growing disease-resistant cultivars, pruning, sanitation, and fungicides.

Avoidance

Since wild plants are often the source of new infections, select a growing site away from wild blackberries and raspberries; if that is not feasible, remove wild plants from as large a radius as possible around the planting. Purchase new plants that have been propagated from roots, since roots do not carry the disease.

Resistant Cultivars

Choose cultivars with some resistance or tolerance to double blossom disease. Most newer thornless blackberries have good resistance; thorny varieties are often susceptible to double blossom. Resistance information is included in descriptions of newly released varieties. The *Midwest Fruit Pest Management Guide* (ID-232) provides resistance information for the following cultivars:

Resistant	Tolerant	Highly Susceptible
Apache	Chester	Chickasaw
Ouachita	Hull	Choctaw
Triple Crown	Navaho	Kiowa
		Shawnee
		Illini Hardy

Pruning & Sanitation

If a small outbreak is discovered, witches' broom growth and infected flowers or buds should be pruned out and destroyed as soon as they are noticed, preferably before flowers open. Diseased plant material should be removed and destroyed; do not compost diseased material.

If the outbreak is widespread, the following rescue treatment can help provide short term control. Cut, trim, or mow infected plants to 12" high after harvest or immediately before flowering. Remove and destroy prunings. This treatment minimizes infection but will sacrifice one year of production.

In areas where blackberry rosette is widespread, growers may divide orchards into halves for alternate year cropping:

- (1) One half of the planting is cut as described above, while the other half is left uncut
- (2) The following year, the cut section is left uncut and the uncut section is cut.

This method provides a full harvest every other year on each section. While this approach is uncommon in Kentucky, it can be used in fungicide/pesticide free systems.

Fungicides

In areas where blackberry rosette is a problem, fungicides can be used in conjunction with sanitation to minimize infection. Begin fungicide applications to minimize infection. Begin fungicide applications when first-year canes are 12" tall and rosetted flowers are just starting to open. Continue applications through harvest until no more rosette-affected flowers are opening. Contact a local county Extension office or the *Midwest Fruit Pest Management Guide* (ID-232) for current fungicide recommendations.

ADDITIONAL RESOURCES

- Extension Plant Pathology Small Fruit Publications <http://plantpathology.ca.uky.edu/extension/publications#SMALLFRUIT>
- Midwest Fruit Pest Management Guide (ID-232) 1.5 MB <http://plantpathology.ca.uky.edu/files/id-232.pdf>
- Fruit, Orchard, and Vineyard Sanitation (PPFS-GEN-05) <http://plantpathology.ca.uky.edu/files/ppfs-gen-05.pdf>
- Sample Fungicide Spray Schedule for Commercial Bramble (PPFS-FR-S-22) <http://plantpathology.ca.uky.edu/files/ppfs-fr-s-22.pdf>
- Rosette (Double Blossom) of Blackberry (USDA-ARS) <https://www.ars.usda.gov/ARSUserFiles/5276/BlackberryRosetteInformation.pdf>

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