



# Diseases of Roses

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Roses continue to be one of the most popular flowers in the garden landscape. Oklahoma roses will produce large quantities of high quality blooms when given proper care. People who like to spend time in the garden will find that rose culture can be a rewarding hobby.

Controlling diseases is an important part of a rose maintenance program. Use of resistant cultivars (varieties) is the most effective disease control measure. Frequent applications of fungicides to prevent fungal infections of leaves is required on susceptible cultivars. Oklahoma's climate favors foliar disease pathogens. Moist soil conditions in rose gardens provide an excellent environment for nematodes, crown gall bacteria, and soil fungi.

Although some cultivars are less susceptible to diseases, there are none that are resistant to all diseases. Black spot, powdery mildew, rose rosette disease, crown gall, and nematode damage are the major disease problems in Oklahoma. Of these, black spot and powdery mildew are the most prevalent fungal diseases. However, there are roses that are resistant to both diseases (Table 1). Rose rosette is a serious viral disease and management is covered in EPP-7329, "Rose Rosette Disease." Damage from plant parasitic nematodes seldom kills roses. The nematodes can, however, weaken plants to the extent that plants cannot withstand severe winter conditions, diseases, insects, and drought.

For information on different rose types and species and rose culture, see Extension Fact Sheet HLA-6403, "Roses in Oklahoma."

## Fungal Diseases

### Black Spot

(caused by the fungus *Diplocarpon rosae*)

Black spot is a serious disease of rose plants. It is characterized by circular black spots on leaves. The spots are distinguished from other leaf spot diseases by the fringed margins and consistently black color of the spots (Figure 1).

The spots vary in size from a 1/2 inch or more than one inch in diameter. Spots may merge to produce large irregular lesions. Yellowing often occurs over the entire leaf, but it may develop only around the spots (Figure 2). When plants are badly infected, leaves drop prematurely and canes may become completely defoliated, thereby reducing the quantity of the flowers and eventually killing the plant.

Warm, wet weather favors the spread of pathogens. Spores of the fungus are spread mainly by splashing water or rain. They germinate in water and infection takes place only when water remains on the leaves for periods of six hours or longer.

### Control

1. Remove and destroy infected leaves during the season; remove infected twigs when pruning.
2. Avoid overhead watering.
3. Plant roses in an area with good soil drainage and ventilation. Avoid shady spots and dense plantings.

Oklahoma Cooperative Extension Fact Sheets are also available on our website at: <http://osufacts.okstate.edu>

4. Prune out old and diseased canes in the fall or winter.
5. Mulch soil around plants and improve pH if necessary (see Extension Fact Sheet HLA-6403, "Roses in Oklahoma").
6. If one wishes to not have to spray for black spot and powdery mildew control, a few resistant cultivars are shown in Table 1. Other cultivars may be available at the local nursery. Disease resistance may be displayed on the plant tag or ask a nursery professional.
7. For chemical control on disease-susceptible cultivars, use fungicides listed in the current circular E-832, Extension Agents' Handbook of Insect, Plant Disease, and Weed Control. It is important that weekly fungicide applications begin with new growth in the spring and continue until frost in the fall. Sprays may be omitted during hot, dry periods in the summer. Many general purpose rose dusts and sprays are available that contain compatible materials for control not only of black spot and powdery mildew, but also for common insect pests. These materials have been well formulated and, if used properly, will give excellent results.

### Powdery Mildew

(caused by the fungus *Sphaerotheca pannosa*)

Powdery mildew is one of the most widely distributed and common diseases of roses. Unlike many foliar diseases, it may be serious in dry climates as well as in humid regions. It develops over a wide range of temperatures.

Powdery mildew produces a powdery, whitish coating on the leaves and other plant parts (Figure 3). In severe cases, plants may become stunted, leaves may curl, become dried, and drop. Unopened buds, young stems, and thorns may be entirely overgrown with the powdery coating. Only in very rare cases does death of the plant result from infection.

Generally, the most favorable conditions for powdery mildew infection are as follows: daytime temperature near 80 F (27 C) and a relative humidity of 97 percent to 100 percent. These conditions prevail during most of the early part of the growing season, thus fungicide applications must be made on a regular basis. In irrigated landscapes, relative humidity may remain high in the humidity throughout the growing season, so powdery mildew may continue to be a problem.

### Control

Maintain proper plant spacing to allow for air circulation through the canopy. Thin plants as needed. Fungicides can be sprayed preventatively when moderate temperature and high humidity is expected, usually in the spring. At the first evidence of disease, fungicides should be applied on a weekly basis until dry weather returns. Thoroughly applied fungicides can effectively control powdery mildew (for suggested fungicides, refer to the current circular E-832, Extension Agents' Handbook of Insect, Plant Disease, and Weed Control). To avoid making repeated fungicide applications, a few resistant cultivars are



**Figure 1.** The primary symptom of black spot disease is circular black spots with fringed borders.

listed in Table 1. Additional cultivars may be available at the local nursery.

### Stem Cankers of Roses

Several species of fungi cause cankers (sunken, swollen or broken areas) on rose canes. Cankers usually appear as discolored areas on dead and dying canes and vary in color from light tan to a dark purplish brown (Figure 4). The causal fungi enter healthy canes through wounds caused by improper pruning, flower cutting, wind, hail damage, winter injury, and cultivation injury. Once the fungal pathogen has entered the plant, the canker may grow and eventually girdle the stem causing a dieback of the cane and, upon reaching the crown, may destroy other canes or the entire plant.



**Figure 2.** Over time, black spot lesions will merge to produce irregular spots. Leaves often turn yellow and drop prematurely.

### Control

1. Maintain plants in a vigorous growing condition (refer to Extension Fact Sheets HLA-6403, "Roses in Oklahoma," and HLA-6404, "Winter Protection for Landscape Plants").
2. Prune out and burn all infected portions of canes. Make cuts well back of the cankered area and about 1/4 inch above an outward facing bud and slanted away from the bud at a 45-degree angle.
3. Disinfect pruning tools after use on a diseased plant.
4. Avoid injury when cultivating and transplanting.
5. A good black spot fungicide spray program will aid in controlling most stem cankers.

### Botrytis Blight

(caused by the fungus *Botrytis cinerea*)

Botrytis blight affects many types of roses. The disease prevents blooms from opening as it causes a brown decay.

**Table 1. Roses with resistance to Black Spot and Powdery Mildew.**

Cultivar	Type	Height (feet)	Color	Fragrant
<b>Rosa hybrida (except <i>R. rugosa</i>)</b>				
Europeana	Floribunda	3	Dark red	Yes
Home Run	Shrub	3 to 4	Flaming red	Slight
Knock Out Series	Shrub	3 to 4	Varies	None to slight
Peach Drift	Groundcover	1.5 to 2	Peach-apricot	None to slight
Pink Home Run	Shrub	3 to 4	Pink	Slight
Pink Peace	Hybrid Tea	4 to 5	Pink	Very fragrant
Tiffany	Hybrid Tea	4 to 5	Light pink	Yes
Tropicana	Hybrid Tea	4 to 5	Dark red	Very fragrant
Coral Drift	Ground cover	1.5 to 2	Coral orange	None to slight
<b>Rugosa roses (<i>R. rugosa</i>): Most form red hips (seed pods) in the fall.</b>				
Agnus	Shrub	5 to 7	Pale lemon yellow	Yes
Alba	Shrub	4 to 6	White	Very fragrant
Blanc Double de Coubert	Shrub	4 to 7	Pure white	Very fragrant
Dart's Dash	Shrub	3 to 4	Deep purple-crimson	Very fragrant
F J Grootendorst	Shrub	4 to 8	Cranberry	Slight
Frau Dagmar Hastrup	Shrub	3 to 4	Light silvery pink	Strong
Grootendorst Supreme	Shrub	3 to 5	Dark red	Slight
Hansa	Shrub	4 to 7	Violet red	Strong
Jens Monk	Shrub	4 to 5	Candy pink with lemon centers	Yes
Linda Campbell	Shrub	4 to 6	Red	No
Keith's Delight	Shrub	5 to 6	Cream with pink and yellow accents	No
Rubra	Shrub	4 to 6	Violet pink-red	Very fragrant
Therese Bugnet	Shrub	4 to 5	Mauve pink	Strong



**Figure 3. Powdery mildew is characterized by a white powdery coating on the leaves, stems or other plant parts.** Photo credit: Clemson University – USDA Cooperative Extension Slide Series, Bugwood.org.



**Figure 4. Stem cankers are visible on rose canes as discolored areas which may be sunken, swollen or broken.**

Sometimes partially opened flowers are attacked, and the individual petals turn brown and shrivel. The fungus is always present in rainy seasons when old flowers are not removed. The fungus also lives in winter-killed canes.

#### Control

Destroy old blooms and dead canes to remove as much fungal inoculum as possible. This fungus will be controlled if a good black spot spray program is followed. Thinning plants to improve air circulation through the canopy is helpful.

### Bacterial Diseases

#### Crown Gall

**(caused by the bacterium *Agrobacterium tumefaciens*)**

Crown gall is characterized by formation of outgrowths (galls) which vary in form and size. At first, the galls are very small with rounded outgrowths on the plant surface. Development continues and the galls may become several inches in



**Figure 5. Crown gall is characterized by outgrowths (galls) which often occur near the soil-line or on roots.**

diameter. They generally form near on the crown (Figure 5). Galls can also occur on roots and occasionally on aerial parts of rose plants.

#### Control

1. Transplant only disease-free plants.
2. Avoid wounding during transplanting.
3. Remove infected plants or plant parts as soon as galls are observed. Where possible, remove and discard all soil adjacent to the root system and replace with sterile soil to prevent reintroduction of the bacteria.
4. Disinfect pruning and cutting tools frequently. Dipping in a 10 percent dilution of household bleach (1 part bleach to 9 parts water) for several minutes will effectively disinfect cutting tools. This should be done immediately after pruning out a gall or abnormal growth. Cut well below the galled area.
5. During cultivation (weeding) of roses, do not injure roots or crown area.
6. If possible, wait one to two years before replanting broad-leaved plants into the same location. If immediate replanting is desired, consider non-hosts which includes most grassy plants.

### Virus Diseases

Like all vegetatively propagated plants, roses are subject to infection by virus pathogens that are spread during propagation or feeding by arthropods. Diseased plants tend to be less vigorous and less likely to survive than healthy plants, and diseases often detract from the aesthetic quality of plants. Two of these diseases are discussed below.

Rose mosaic is found virtually everywhere roses are grown and can be recognized by light green to bright yellow mosaic patterns on leaves of infected plants (Figure 6). Symptoms of rose rosette disease include leaflet deformation and wrinkling, bright red leaf pigmentation, witches brooming, and phyllody (conversion of flower parts to a leaf-like appearance). Rose rosette is a second serious virus disease of roses and is thoroughly discussed in Extension Fact Sheet EPP-7329 "Rose Rosette Disease."

#### Control

There is no known practical cure for diseases caused by viruses once infection has occurred. Infection with rose mosaic



**Figure 6. Rose mosaic is a virus disease that causes unusual mosaic or line patterns on rose leaves.**

does not sufficiently damage plants to necessitate their immediate removal. However, all plants with significant symptoms caused by viruses should be removed from the nursery or landscape and destroyed. The best control for virus diseases is to use only pathogen-free buds and rootstocks during propagation.

Accidental herbicide damage sometimes resembles symptoms of virus infection. To avoid possible herbicide injury, it is better to apply herbicides during fall rather than in the spring. Do not spray herbicides during windy periods and consider shielding plants to prevent accidental drift.

## Nematode Diseases

Many rose growers have observed rose plants that have failed to respond to good cultural practices and exhibit yellowing, dwarfing, and reduced vitality. These symptoms may be caused by plant-parasitic, microscopic worms called nematodes. Above-ground symptoms are an indirect result of root damage. Below-ground symptoms include root galls (root-knot nematodes), root lesions (root-lesion and ring nematodes), and injured root tips (stubby-root and other nematodes).

### Control

1. Plant nematode-free plants. Commercial propagators usually subject roots of understocks to a hot water treatment (122F for 10 minutes) to destroy any nematodes present.
2. Reduce nematode populations in gardens with heat using a technique called solarization. See Extension Fact Sheet EPP-7640, "Soil Solarization for Control of Soil-borne diseases." This procedure must be done prior to planting.

## Nutritional Disorders

**Iron deficiency.** Iron deficiency is characterized by chlorosis (yellowing) of non-veinal tissue of young leaves. The veins usually remain dark green. **Manganese deficiency** exhibits similar symptoms. If the deficiency is allowed to continue, newly formed leaves may remain very small and may eventually become almost white. Pink or white flowered cultivars exhibit this symptom more than red flowered cultivars.

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Some cases of iron or other micronutrient deficiency are caused by some factor that interferes with the availability or uptake from soil, rather than by an actual deficiency in the soil. These influences include high soil pH, poor soil aeration, overwatering, root-knot nematodes, extremes in temperatures, high soluble salt concentrations, and over-fertilization. For long-term correction of iron or micronutrient deficiency, the appropriate soil problem needs to be identified and corrected. For short-term correction of iron deficiency, foliar applications of chelated iron products can be made. A soil analysis should be done to determine soil pH and the amount of lime or sulfur needed to change the pH to a suitable value. Refer to OSU Extension Fact Sheet HLA-6412, "Fertilizing Shade and Ornamental Trees and Shrubs."

**Nitrogen deficiency.** Nitrogen deficient leaves have an overall light green or yellow color with no distinct green veins (Figure 7). Deficient leaves may fall off. Affected leaves are generally small; internode length and stem diameters are smaller than normal. Few flowers may be produced and they may have lighter shades of color than normal.

Apply a readily available nitrogenous fertilizer to planting soil or potting medium. Numerous specialty rose fertilizers are available.

**Potassium, phosphorus, zinc, copper, magnesium, sulfur, boron, molybdenum, and sulfur deficiencies** can occur under unusual situations, particularly under greenhouse hydroponic culture conditions. Roses grown in soil rarely show symptoms of deficiency of these elements.

**Herbicide Injury.** Herbicides can cause unusual discoloration or distortion to rose leaves. Symptoms of herbicide injury may be confused with nutritional deficiencies or virus diseases. Damaged plants do not respond to fertilizer applications as with nutritional deficiencies. If a virus disease is suspected, laboratory testing may be necessary.

It is important to continue disease and insect control and proper watering to help plants recover from herbicide injury. Significantly disfigured plants may require removal. If the herbicide contaminates the soil, it is not recommended to replant into the same area until the herbicide is degraded.



**Figure 7. Nitrogen deficiency causes rose leaves to have a light green appearance. The veins are also lighter colored than normal.**