DISEASES

Diseases of roses in Colorado no. 2.946

by L. Pottorff and W.M. Brown, Jr.[1]

Quick Facts...

Colorado's dry climate and high altitude are not conducive to the development of most fungal diseases.

Rose mosaic, caused by a virus, is found worldwide. Symptoms vary, but usually show up as mosaic patterns or splotches of yellow and green on leaves.

Powdery mildew is one of the state's most common rose diseases because it occurs in dry as well as humid weather.

Rust first appears on the undersides of leaves and other plant parts as orange powdery "pustules".

Anthracnose appears as leaf spots, sometimes running together, they are usually 0.5 centimeters in diameter, circular with dark red margins.

Introduction

Few rose diseases are found under Colorado conditions. The state's dry climate and high altitude are not conducive to the development of most fungal diseases and viruses commonly associated with roses are not known to have insect vectors.

Roses are becoming more popular in Colorado gardens. As a result, people often plant them close together making the environment among the plants more conducive for powdery mildew, rust and other fungi. However, most of these problems can be managed and it is seldom necessary to use fungicides if gardeners are careful about plant selection, site location, soil preparation, fertilization, watering and pruning.

With two exceptions, fungi cause most Colorado rose diseases. Foliar fungal diseases are spread by air or water-borne spores that survive on leaf debris. Nine diseases and their control are described below.

Rose Mosaic Virus

Rose mosaic, caused by a virus, is found worldwide. Symptoms vary, but usually show up as mosaic patterns or splotches of yellow and green on leaves (Figure 1). Flowers may be mottled in color, a condition called flower breaking.

Leaf and flower symptoms may detract from the overall quality of the plant. Infected plants may be more sensitive to winter injury. Several rose growers in Colorado report problems with the virus; they say symptoms are more prominent in some seasons than others. This is because growing conditions change from year to year for roses. Plant health, weather, varieties and other factors all can contribute to virus symptoms. No evidence exists that this virus is transmitted by insect transmission, therefore, appears to be limited to rooting a cutting and root grafting.

Figure 1: Symptoms of Rose Mosaic Virus.

The only way to control rose mosaic is to remove infected plants. Because of limited effect on flowering, most people leave the plant alone and ignore the virus. Management of rose mosaic virus is through the use of virus-free stock.

Powdery mildew

Powdery mildew is one of the state's most common rose diseases because it occurs in dry as well as humid weather. The powdery mildew fungus, *Sphaerotheca pannosa*, produces a white, talcum powder-like growth on the top and bottom of the leaves and stems (Figure 2).

Figure 2. Powdery Mildew.

When the disease is severe, plants become stunted and leaves curl and drop. While other powdery mildew fungi can have several plant hosts, *S. pannosa* attacks only roses.

Generally, the most favorable conditions for powdery mildew are day-time temperatures near 80 degrees F with a relative humidity of 40 to 70 percent, and night-time temperatures near 60 F.

Management of powdery mildew is accomplished through the use of: 1) resistant varieties; 2) sanitation by removing and destroying infected shoots at the end of the season along with raking up infested fallen, dead leaves; and 3) spraying with sulfur dusts or systemic fungicides (i.e. thiophanates, triforine [Funginex], triadimefon).

Rust

Rust first appears on the undersides of leaves and other plant parts as orange powdery "pustules". As these pustules develop, they become visible on the upper leaf surfaces as orange brown spots. Nine species of the rust fungus *Phragmidium* are found on roses. Rust can develop when temperatures are 65 to 70 F, and moisture is continuous for two to three hours.

Considerable variation exists in plant resistance and it is not uncommon for only one or two rose varieties in a planting to get rust while others remain rust-free. It might be that a species of the fungus is present that can only develop on particular varieties. With the potential of nine different rust species that can attack roses, there frequently are differences in resistance.

Management of rose rust depends on a variety of approaches. When used in an integrated system, these different approaches can minimize the development and damage caused by the fungus. These include: 1) use of resistant varieties; 2) sanitation by removing infected stems and leaves at first appearance; (careful pruning of old canes helps to eliminate rust carry-over on the canes, promote air movement, and drying of leaves); and 3) use of preventative fungicides (chlorothalonil [Daconil 2787]) or systemic fungicides (triadimefon or triforine [Funginex]).

Other Diseases

Anthracnose or spot anthracnose is a disease that appears to be more prevalent in Colorado after a dry spring. Hybrid teas, as well as old fashioned varieties, are susceptible. World-wide, this disease seems to be of little importance as there is virtually no documentation of it in the literature. Symptoms occur as leaf spots, sometimes running together, they usually are 0.5 centimeters in diameter, circular with dark red margins. Newly formed spots are red or purple. Older spots have white centers with a dark-red margin. A shot-hole effect may occur (the spot itself drops out of the leaf leaving a circular hole). Defoliation may occur if the disease is severe.

Botrytis blight mainly affects hybrid tea roses. The fungus attacks leaves and canes, prevents blooms from opening and often causes flower petals to turn brown and shrivel. To diagnose, look closely at cankered stems, brown leaves and flowers. If the fungus is present, the affected areas of plants often are covered with a grayish brown fuzzy growth. Cooler temperatures, moisture and weakened plant tissue create conditions that invite Botrytis blight. Roses under stress will be highly susceptible to this disease.

Blackspot disease, in Colorado, is more common on some of the old fashioned rose varieties. Hybrid teas often don't show symptoms in this climate. The disease is characterized by nearly circular black spots with fringed (not smooth) margins (Figure 3). The spots vary from less than one-sixteenth to one-half inch or more in diameter. Blackspot is favored by wet weather and 65 to 75 F temperatures. Severe infections will cause defoliation.

Coniothyrium canker is not a common problem in this area, however, it can be found in greenhouses, and occurrences of this disease were reported on outdoor roses in the spring of 1991. Symptoms include a discoloration of woody tissue (canker), usually near the base of the plant. The fungal cankers eventually can girdle the plant. The disease can be serious on rose plants in storage, in nurseries (where plants are crowded together and foliage is wet) and on recently planted roses, especially if they are placed under stress.

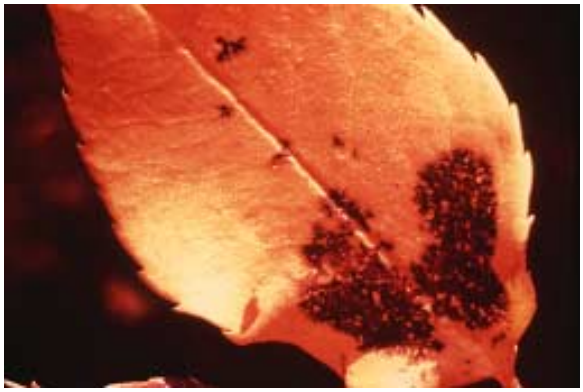

Figure 3. Black Spot of Rose.

Crown gall is caused by a bacterium that survives in the soil. The pathogen enters the crown or roots via wounds made by mechanical damage or insect feeding. Once inside the plant the bacterium causes the cell tissue to proliferate forming a gall (tumor-like growth) on the crown or roots. The proliferated tissue eventually will girdle the rose leading to death of the plant. Plants infected with the crown gall bacterium should be destroyed. The bacterium is able to survive in galls and plant residue in the soil for many years without a rose host. Roses, therefore, should not be planted in crown gall infested soil for at least five years.

Verticillium wilt is caused by the soil-borne fungus Verticillium albo-atrum. The disease becomes evident when temperatures are hot (late June to August). Initial symptoms begin with the wilting of new leaves and yellowing of older leaves. Permanent wilting occurs after a few days and leaves eventually turn brown and die. This disease can be confused with other problems such as insect infestations or environmentally related causes. Make sure Verticillium wilt is positively identified by an appropriate plant disease clinic before following control measures. To control the disease, remove and destroy infected plants. Because the fungus responsible for the disease survives in the soil, do not plant roses in contaminated soil for three years or longer.

Disease Controls

Most rose diseases can be controlled or prevented with simple maintenance or cultural practices. Fungicides are necessary only in severe cases.

- Buy and plant disease-free plants.
- Choose resistant varieties. Varieties are available with resistance to powdery mildew, blackspot and many other diseases. See Table 1.
- Avoid wounding plants during transplanting.
- Plant roses in areas with good soil drainage and ventilation. Avoid shady spots and dense plantings. This will improve air circulation so that leaf surfaces will dry faster, preventing disease infection.
- Remove and destroy infected leaves and canes during the season.
- Avoid overhead watering. Water on the leaf surface will increase the chance of foliar disease infection.
- If disease is severe, fungicide use may be warranted. Diagnose the problem correctly before applying a chemical. Read and follow all chemical label directions carefully.

Table 1: Rose Varieties With Some Degree of Resistance to Certain Diseases in Colorado.*

Cultivar	Resistance to: Powdery mildew	Rust	Black spot
HYBRID TEA			
Dainty Bess			Yes
Duet	Yes		Yes
Fragrant Cloud	Yes	Yes	Yes
Mikado			Yes
Miss All-American Beauty			Yes
Mister Lincoln			Yes
Olympiad	Yes	Yes	Yes
Pascali			Yes
Pink Peace			Yes
Pristine	Yes	Yes	Yes
GRANDIFLORA			
Aquarius		Yes	Yes
Camelot	Yes	Yes	
Gold Medal	Yes	Yes	Yes
Prima Donna			Yes
Queen Elizabeth	Yes	Yes	Yes
FLORIBUNDA			
Cherish			Yes
Europeana			Yes
Evening Star			Yes
French Lace			Yes
Gene Boerner			Yes
Ice berg			Yes
Impatient			Yes
Ivory Fashion			Yes
Summar Fashion			Yes
Sunfire		Yes	
Sunsprite			Yes
ALBA			
Konigin von Danemark	Yes		Yes
SHRUBS			
Bonica	Yes		
GALLICA			
Alain Blanchard	Yes		Yes
Charles de Mills			Yes
DAMASKS			
Leda	Yes		
RUGOSA			
Pink Grootendorst	Yes		Yes
Grootendorst Supreme	Yes		Yes
SPECIES			
Rosa glauca	Yes		Yes
R. hugonis			Yes
R. pomifera		Yes	
R. rugosa	Yes		Yes
R. rugosa alba	Yes	Yes	Yes
R. setigera	Yes	Yes	Yes
R. spinossissma	Yes	Yes	Yes

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[1]*L. Pottorff, Colorado State University Cooperative Extension plant pathologist and horticulturist, W.M. Brown, Jr., Cooperative Extension plant pathologist; plant pathology and weed science.*

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