NebGuide
IANR
University of Nebraska Lincoln
Published by University of Nebraska–Lincoln Extension, Institute of Agriculture and Natural Resources

G1060
(Revised January 2007)

Black Spot of Roses

Stephen N. Wegulo, Extension Plant Pathologist; John C. Fech, Extension Educator; Kathleen P. Cue, Extension Associate; and Mary Anna Anderson, Extension Associate

Causes, symptoms, distribution, disease cycle, cultural and chemical management and available fungicides for control of black spot, Nebraska's most troublesome disease of roses.

The rose is the national flower of the United States. Roses are one of the most versatile ornamentals for landscaping, with cultivars adapted for any garden site and landscape purpose. They offer many positive attributes to a landscape, including flower color, form, texture, winter color and interest. Growing roses can be more challenging than growing other ornamentals because roses often require more intensive management. As with any group of plants, some cultivars are easy to care for and others are quite problematic. One of the greatest challenges to successfully growing garden roses is disease management.

Cause and Distribution

Black spot is caused by the fungus *Diplocarpon rosae* (perfect or sexual stage: *Marssonina rosae*). It is the most important disease of roses worldwide. It was first recorded in the United States in 1830 and is now found throughout North America. In Nebraska, it is the most serious disease of roses and, if not effectively managed, it can severely weaken plants and lead to increased susceptibility to winter injury or dieback due to other causes.

Symptoms

Black, nearly circular spots ranging in diameter from just under one-tenth of an inch to about one-half inch occur on the upper leaf surfaces (*Figure 1A*). They have characteristic feathery margins. The spots can coalesce (*Figure 2*), but often remain distinct. Infected leaflets usually turn yellow (*Figures 3 and 4*) and drop from the plant. Lower leaves are usually infected first, followed by middle and upper leaves (*Figure 4*). Excessive defoliation reduces stem length and size and the number and quality of leaves and blossoms. It also weakens plants and increases the risk of winter injury from cold temperatures. In resistant cultivars or during dry weather, only small spots may form without defoliation.

Symptoms also can occur on canes (*Figure 1B*). They usually occur in the form of raised purple blotches on immature wood of first-year canes, which later become blackened and blistered. Branches are rarely killed by lesions on canes; however, the pathogen survives the winter in these lesions. Inconspicuous, reddish-purple spots may result from infection of petioles, stipules, peduncles, fruit and sepals.

Disease Cycle

The black spot fungus overwinters as mycelia or spores in infected canes and leaves. In the spring, overwintering mycelia or spores cause primary (initial) infections on new shoots. Within about two weeks after primary infections, fruiting structures form within lesions and produce spores which cause secondary infections throughout the growing season.

Favorable Conditions

Rose leaves are most susceptible to infection when they are young and actively expanding. At least seven hours of continuous wetness is required for spores to cause infection. Infection occurs directly through the cuticle on both sides of the leaf. Temperatures ranging from 72°F to 86°F favor symptom development with 75°F being the optimum temperature for disease development.

Wet weather favors disease development and spread. Black spot usually is not a problem in greenhouses where humidity is carefully regulated and measures are taken to avoid prolonged wetting of foliage. Spores are spread mainly by splashing water but may become windborne. The pathogen also can be disseminated locally by windblown leaves.

Disease development can be influenced by plant architecture. Compact roses or those that develop leaves close to the ground are more prone to infection than roses with an open canopy. Crowded plantings generally have higher humidity within the canopy which favors disease development.

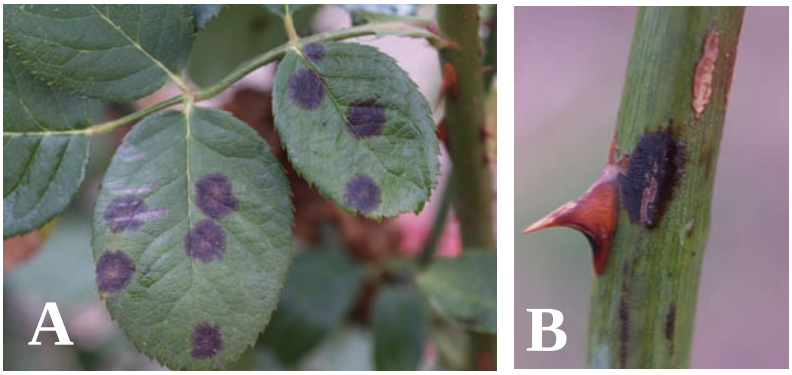

Figure 1. Black spots with feathery margins on leaflets (A) and a cane exhibiting symptoms of black spot fungus (B).

Management

An integrated disease management approach can be used to minimize damage caused by black spot. The first step is to select disease resistant cultivars. Most garden catalogs will identify rose cultivars resistant to black spot and other diseases. Growing resistant cultivars will save time and money spent on buying and spraying fungicides.

Table I. Nationally known rose cultivars that have been demonstrated to be disease resistant and winter hardy over a period of four or more years through evaluations by Nebraska rosarians and Extension Master Gardeners. For the sake of convenience, rose cultivars with floribunda, grandiflora, polyantha and rugosa genetics are grouped with the shrub roses. A good synonym for shrub rose is "landscape rose."

Name	*Color*	*Size (h x w)*	*Comments*
Shrub Roses			
Aunt Honey	Pink	3 x 4 ft.	Fragrant, repeat blooms
Baby Love	Yellow	4 x 3 ft.	Single flowers, glossy green leaves
Bright Melody	Red	4 x 3 ft.	Sweet fragrance; blooms until frost
Carefree Beauty	Pink	3 x 3 ft.	Slight fragrance, good cut flower
Carefree Delight	Pink	2.5 x 2.5 ft.	Clusters of blooms; dependable repeat
Champlain	Red	3 x 3 ft.	Slight fragrance, blooms all summer
Chuckles	Pink	3 x 3 ft.	3 ½ inch fragrant blossoms
Country Dancer	Pink	3 x 3 ft.	Large glossy foliage, double blooms
David Thompson	Pink	4 x 4 ft.	Fragrant, repeat bloomer
Distant Drums	Yellow/Pink	3 x 3 ft.	Light scent, large blooms
Earth Song	Pink	4 x 5 ft.	Fruity fragrance, blooms until frost
Eglantine	Dark Pink	3 x 4 ft.	Slight fragrance, blooms all summer
Fair Bianca	White/Pink	3 x 3 ft.	Intense fragrance
Frau Dagmar Hastrup	Rose/Pink	3 x 3 ft.	Compact plant; crimson hips
Freckles	Pink	3 x 4 ft.	Slight fragrance, double flowers
Frontenac	Pink	4 x 3 ft.	Intense fragrance, double flowers
George Vancouver	Red	3 x 3 ft.	Large flowers, good plant for containers
Griffs Red*	Red	4 x 3 ft.	Moderately fragrant, blooms all summer
Hi, Neighbor	Red	Up to 4 ft.	Fragrant, cupped flowers
Jens Munk	Lavender	5 x 5 ft.	Very fragrant
Lambert Closse	Pink	4 x 3 ft.	Slight fragrance, blooms all summer
L.D. Braithwaite	Red	5 x 4 ft.	Moderately fragrant, blooms all summer
Macy's Pride™	Creamy White	5 x 5 ft.	Yellow buds open to cream colored flowers
Moonstone*™	White/Pink	5 x 3 ft.	Large white blossoms edged in pink
Morden Blush	Light Pink	2 x 2 ft.	Slight fragrance, blooms all summer
My Hero	Red	3 x 3 ft.	Continuous bloom
Our Lady of Guadalupe	Pink	3 x 3 ft.	Slight fragrance, blooms all summer
Paloma Blanca	White	3.5 x 3.5 ft.	Abundant bloom June to frost
Playboy	Orange/Red	4 x 4 ft.	Single flowers, repeat blooming
Prairie Breeze	Mauve	4 x 4 ft.	Spicy fragrance, blooms all summer
Prairie Harvest	Yellow	4 x 4 ft.	Blooms continuously; fragrant
Prairie Joy	Pink	4 x 4 ft.	Double blooms, arching form
Tamora	Apricot	3 x 3 ft.	Very fragrant, continuous bloom
Therese Bugnet	Light Pink	3 x 3 ft.	Very fragrant, continuous bloom
Winter Sunset	Yellow	3 x 3 ft.	Good cut rose, very fragrant, small clusters
Climbing Roses			
Dublin Bay	Red	10 x 6 ft.	Fragrant, semi-double blooms
Henry Kelsey	Red	7 x 3 ft.	Spicy fragrance, blooms all summer
Jeanne LaJoie	Lavender	10 x 3 ft.	Climbing miniature, but vigorous
John Cabot	Red	9 x 7 ft.	Slight fragrance, blooms all summer
Quadra	Dark Red	7 x 3 ft.	Slight fragrance, blooms all summer
Ramblin' Red	Red	8 x 3 ft.	Double, continuous blooms
Sally Holmes	Creamy	10 x 3 ft.	Vigorous climber, single flowers
Seminole Wind	Pink/Coral	10 x 5 ft.	Blooms in clusters from May to frost
White Dawn	White	12 x 3 ft.	Very fragrant, double flowers
William Baffin	Deep Pink	10 x 4 ft.	Slight fragrance, blooms all summer
Miniature Roses			
Giggles	Pink	14-26 in. tall	Hybrid tea-shaped blooms
Incognito	Lavender	14-24 in. tall	Strong fragrance; gold reverse
Martha's Vineyard	Pink	2 x 2 ft.	Great addition to perennial borders
Millie Walters	Orange/Red	14 in. tall	Constant bloom
Sun Sprinkles	Yellow	2 x 2 ft.	Spicy fragrance, compact habit
Winnipeg Parks	Red	2 x 2 ft.	Slight fragrance, blooms all summer

*These rose cultivars are actually hybrid tea roses, but have similar dimensions to shrub roses and function much the same in the landscape.

Table II. Fungicides for control of black spot of roses.

Common Name	*Some Trade Names: Commercial/Professional**	*Some Brand/Trade Names: Homeowner***
azoxystrobin	Heritage	
captan	Captan	Hi-Yield Captan Fungicide; Bonide Captan Fruit and Ornamental
chlorothalonil	Daconil Ultrex; Daconil Weather Stik; Daconil Zn Flowable	Ortho Garden Disease Control; Ferti-lome Liquid Fungicide; Bonide Fung-onil Multi-purpose Fungicide; Monterey Bravado Fungicide
chlorothalonil + thiophanate-methyl	Spectro 90 WDG	
kresoxim-methyl	Cygnus	
mancozeb	Dithane 75DF; Junction	Bonide Mancozeb Flowable
myclobutanil	Eagle 40WP; Systhane WSP	Spectracide Immunox Multipurpose Fungicide
propiconazole	Banner MAXX; Propiconazole Pro	Ferti-lome Systemic Fungicide; Bonide Infuse
pyraclostrobin	Insignia	
tebuconazole		Bayer Advanced Garden Disease Control for Roses, Flowers & Shrubs
thiophanate-methyl	Cleary 3336; OHP 6672 50 W; T-Storm 50 WSB	Ferti-lome Halt Systemic Fungicide; Green Light Systemic Fungicide
trifloxystrobin	Compass O 50WDG	
triforine		Ortho Rose Pride Rose & Shrub Disease Control
copper ammonium complex	Copper-Count-N	Monterey Liqui-Cop
copper hydroxide	Champ; Champion; Kocide 3000	Ferti-lome Blackspot Powdery Mildew Control; Hi-Yield Copper Fungicide
copper oxychloride + copper sulfate	C-O-C-S WDG	
copper salts	Camelot	Bonide Liquid Copper Fungicide; Concern Copper Soap Fungicide
copper sulfate	Phyton 27	Bonide Copper Dust or Spray; Dexol Bordeaux Powder
lime sulfur	Lime Sulfur	Bonide Lime Sulfur Spray; Hi-Yield Lime Sulphur Spray
neem oil	Triact 70	Bonide Rose Rx 3-in-1; Ferti-lome Triple Action Plus; Monterey 70% Neem Oil
potassium bicarbonate	Kaligreen; MilStop	Bonide Remedy
sulfur	Sulfur 90W	Bonide Sulfur Plant Fungicide; Ferti-lome Dusting Sulphur; Green Light Wettable Dusting Sulphur; Hi-Yield Dusting Wettable Sulphur; Safer Garden Fungicide
Hydrogen Dioxide	ZeroTol	

*Products marketed toward professional pesticide applicators. Some have residential sites on the label. They are sold in larger quantities and at higher unit prices than products sold to homeowners. Labels on some of these products prohibit homeowners from using them. The products may, however, be applied by lawn and landscape professionals as a disease management service to homeowners.

**Products marketed toward homeowners. They are usually available in small quantities at lower unit prices than those sold to professional pesticide applicators. Their availability varies; some garden centers and/or nurseries may carry only certain brand names. Some homeowner fungicides are marketed as combination products containing a fungicide and an insecticide or a fungicide, insecticide and miticide.

Figure 2. In severe cases or when environmental conditions favor disease development, black spots may coalesce into larger blotches.

Figure 4. Lower leaves usually are the first to become infected by black spot, followed by middle and upper leaves. Infected leaves turn yellow and drop.

Rose cultivars vary widely in their resistance to black spot. Hybrid teas, grandifloras and miniature roses are more susceptible. Floribundas, shrub roses and climbers are more resistant or tolerant. *Table I* lists nationally known rose cultivars that have been demonstrated to be disease resistant and winter hardy over a period of four or more years through evaluations by Nebraska rosarians and extension Master Gardeners. Because of the occurrence of different pathogenic races of the black spot fungus, resistance of a given cultivar may vary depending on the environment.

Sanitation and cultural practices that do not favor disease development are an essential part of an integrated black spot management program. Removing and destroying infected canes and fallen leaves in the fall will reduce the amount of over-wintering inoculum which could cause primary infections during the following growing season. Planting roses in sunny locations and spacing plants adequately to allow good air circulation will promote quick drying of foliage. If possible, avoid sprinkler irrigation. If sprinkler irrigation is used, water in the morning and not in the evening. A 3-inch layer of mulch around the drip line of plants will reduce splashing

Figure 3. Yellowing of a leaflet infected by black spot.

of spores from fallen leaves. Maintain good plant health by proper watering and fertilization.

It is often necessary to include fungicide sprays in an integrated disease management program when roses susceptible to black spot are grown and environmental conditions favor disease development. In Nebraska, conditions favorable to disease development occur from mid-May to mid-September. Several fungicide products are available for control of black spot *(Table II)*. Repeated applications at intervals specified on the label may be necessary to protect newly emerging foliage. To reduce the chances of fungicide resistance build-up in the black spot fungus, tank-mix or alternate fungicides with different modes of action. To maximize efficacy of a fungicide application, ensure thorough coverage of the foliage. Because rose foliage is waxy, adding a commercial spreader sticker (surfactant) or household detergent (about half a teaspoon per gallon) to the fungicide spray mixture will improve coverage. Always read and follow label instructions for mixing and applying fungicides. Do not apply a fungicide immediately before rainfall or sprinkler irrigation as these can wash off some or all of the fungicide, reducing efficacy.

Acknowledgment

The previous edition of this NebGuide was written by John E. Watkins, retired UNL Extensin plant pathologist.

Disclaimer

References to fungicide products in this NebGuide are for the reader's convenience. The University of Nebraska–Lincoln Extension neither endorses products listed nor discriminates against products omitted, nor does the University of Nebraska–Lincoln Extension guarantee effectiveness of those products listed. Consult the product label before purchase to ensure it is registered for use on roses.

Index: Horticulture
Ornamentals

1991, Revised January 2007