

Black Spot of Rose¹

Jozer Mangandi and Natalia A. Peres²

Introduction

Black spot is a fungal disease that affects nearly all rose cultivars worldwide. It is a frequent problem for roses grown outdoors and reduces the quality and life span of the plants. However, the poor performance of roses in Florida can also be associated with various factors such as inadequate fertilization and water deficiency during the warm season, as well as the use of root stocks and scions not well-adapted to Florida's conditions.

Causal Agent and Geographical Distribution

The black spot pathogen, *Marssonina rosae* (*Diplocarpon rosae*, sexual stage), is a parasite specific to roses and is considered the most serious disease of roses in Florida. The disease was first reported in Sweden in 1815 and in the United States in 1830. Since then, it has been reported in South America, Canada, Australia, and China, among other countries.

Different genotypes or races of *M. rosae*, i.e., isolates that infect a specific cultivar or group of cultivars have been identified. Certain species of roses and cultivars of old garden roses are considered more resistant to the disease than modern cultivars. Modern roses and especially the popular hybrid teas are not only more susceptible to the

disease, but also are considered high maintenance roses in Florida requiring more attention to disease control, fertilization, and irrigation.

Symptoms

M. rosae produces black spots of about two to 12 mm in diameter usually in the upper surface of the leaves (Figure 1a). Often, those spots may have irregular, radiate, feathery borders (Figure 1b). In older lesions, black spore-bearing structures, called acervuli, can be observed as well as white, slimy masses of conidia (Figure 2a). Yellowing around the lesions on infected leaves can occur, and severe defoliation occurs in the most susceptible cultivars. While leaves are the most susceptible part of the plant, stipules and pedicels can also be infected. Spots can also be found also in peduncles, fruits, and sepals. Symptoms of black spot are usually confused with those of *Cercospora* leaf spot (See EDIS publication *Cercospora Leaf Spot of Rose* at <http://edis.ifas.ufl.edu/PP267>).

The infection cycle starts when spores are spread by rain or overhead irrigation from leaves or canes infected from the previous season. The conidia must be wet for several hours to infect plant tissues. Symptoms begin to appear in three to 16 days after infection. Mature conidia can be produced 10 to 18 days after infection and initiate a new cycle. Conidia are colorless and two-celled (Figure 2b). A temperature of

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2. Jozer Mangandi, Ph.D., former graduate student, Department of Horticultural Sciences; and Natalia A. Peres, professor, Department of Plant Pathology, UF/IFAS Gulf Coast Research and Education Center; UF/IFAS Extension, Gainesville, FL 32611.

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64°F is optimal for black spot development, but conidia germination still occurs from 59°F to 81°F. This wide temperature range allows the disease to continue to develop as long as the moisture is adequate during the season.



Figure 1a. Leaves of 'Old Blush' rose infected with *Marsonina rosae*.
Credits: J. Mangandi, UF/IFAS

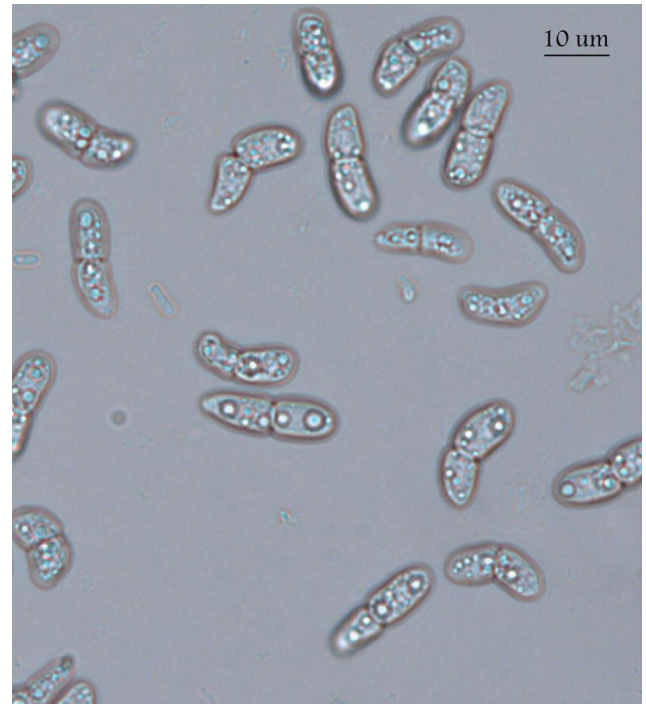


Figure 2b. Microscopic view of two-celled conidia of *Marsonina rosae*, 400x.

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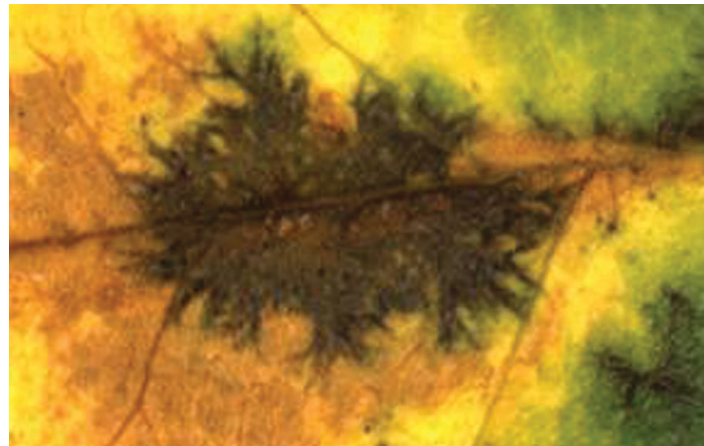


Figure 1b. Typical lesion of black spot on a rose leaf.
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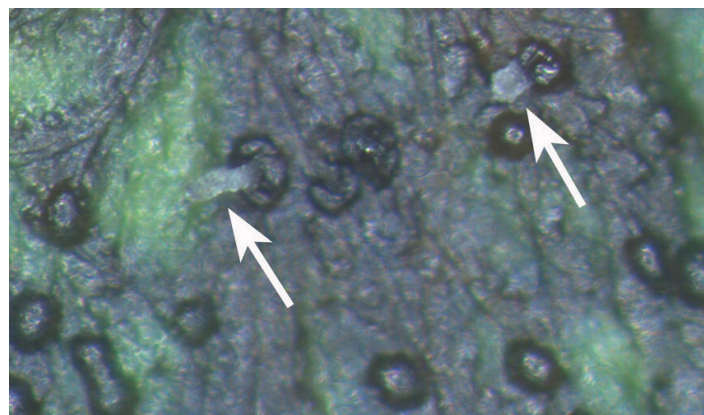


Figure 2a. Black acervuli on a lesion caused by *Marsonina rosae*. Note the white masses of conidia (arrows), 50x.

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Control

Black spot can be controlled by planting cultivars with resistance to the disease such as WEKciskako (HomeRun®) or RADrazz (Knock Out®). These cultivars are, however, susceptible to *Cercospora* leaf spot. Old garden roses 'Mrs. B.R. Cant' and 'Spice' have shown good levels of resistance to both diseases in our trials. Sanitation practices, such as removal and burning of fallen leaves and pruning of canes late in the winter before new shoots are produced, help reduce the amount of inoculum. Plants should not be allowed to remain wet for long periods of time and overhead irrigation should be avoided or minimized. If this is not possible, plants should be irrigated early in the morning to allow leaves to dry.

For chemical control, an initial application of a protectant fungicide should be made at bud break, followed by bi-monthly applications until leaves are completely expanded. During the summer, applications every 7–14 days may be necessary to successfully manage the disease. Fungicides labeled for the control of black spot of roses in Florida are listed in Tables 1 and 2. For managing fungicide resistance, the best strategy is to rotate among products with different modes of action. All fungicides within the same group (with the same number or letter) have the same active ingredient or a similar mode of action. Fungicide resistance is usually low with multi-site inhibitor fungicides group (M).

Table 1. Fungicide products marketed for use by professional pesticide applicators for control of black spot on roses.

Trade name	Active ingredient	Fungicide group
Heritage Strobe 2L	Azoxystrobin	11
Captan 50 WP, Captan 50 W, Captec 4L	Captan	M4
Spectro 90 WDG	Chlorothalonil + thiophanate-methyl	M5 + 1
Many brands available: ArmorTech CLT 720, ArmorTech CLT 825, Chlorothalonil 720, Daconil Ultrex Turf Care, Docket DF, Echo 720 Turf and Ornamental, Echo ZN T&O, Esign 82.5, Initiate 720 Flowable Fungicide, Legend, Phoenix Pegasus 6L	Chlorothalonil	M5
Champ Formula 2 Flowable, CuPRO 2005 T/N/O	Copper hydroxide	M1
COC DF, COC WP, Badge SC	Copper hydroxide + Copper oxychloride	M1
C-O-C-S WDG	Copper oxychloride sulfate	M1
Junction	Copper + Mancozeb	M1 + M3
Dithane 75 DF Rainshield, Koverall, Fore 80WP Rainshield, Manzate Max T&O	Mancozeb	M3
Maneb 75 DF, Maneb 80 WP	Maneb	M3
AmTide, Banner Maxx, Dorado, Procon Z, Propensity 1.3 ME	Propiconazole	3
Clearscape T&O, Offset 3.6F, VIBE	Tebuconazole	3
Fungo Flo, Helena T-Methyl 4.5 F, Incognito85 WDG, Nufarm T-Methyl SPC 4.5 F, OHP 6672 4.5 F, Tm 85 WGD	Thiophanate-methyl	1
Armada 50 WDG	Trifloxystrobin + Triadimefon	3 + 11
Cosavet DF, Drexwl Sulfur 90W, Kumulus DF, Micro Sulf, Microthiol Dispers, Thiofix 80 DF	Sulfur	M2
Ziram 76 DF, Ziram granuflo	Ziram	M3
Fungicide Group (FRAC Code): Numbers (1–37) and letters (M) are used to distinguish the fungicidal mode of action groups. All fungicides within the same group (with same number or letter) indicate same active ingredient or similar mode of action. This information must be considered in making decisions about how to manage fungicide resistance. M=Multi-site inhibitors, fungicide resistance is low. Source: http://www.frac.info/ (Fungicide Resistance Action Committee, FRAC). Not all legally available products sold in Florida are listed. For such a list, contact the Florida Department of Agriculture. Be sure to read a current product label before applying any chemicals.		

Table 2. Fungicide products marketed toward homeowners for control of black spot on roses.

Trade name	Active ingredient	Fungicide group
Hi-Yield Captan Fungicide, Bonide Captan Fruit and Ornamental	Captan	M4
Ferti-lome Liquid Fungicide, Bonide Fung-onil Multipurpose Fungicide, Monterey Bravado Fungicide, Ortho Garden Disease Control	Chlorothalonil	M5
Monterey Liqui-Cop	Copper ammonium complex	M1
Ferti-lome Blackspot Powdery Mildew Control, Hi-Yield Copper Fungicide	Copper hydroxide	M1
Bonide Copper Dust or Spray, Dexol Bordeaux Powder	Copper sulfate	M1
Bonide Mancozeb Flowable	Mancozeb	M3
Spectracide Immunox Multipurpose Fungicide	Myclobutanil	3
Bonide Rose Rx 3-in-1, Ferti-lome Triple Action Plus, Monterey 70% Neem oil	Neem Oil	NC
Bonide Remedy	Potassium bicarbonate	NC
Ferti-lome Systematic Fungicide, Bonide Infuse	Propiconazole	3
Bonide Sulfur Plant Fungicide, Ferti-lome Dusting Sulfur, Green Light Wettable Dusting Sulfur, Hi-Yield Dusting Wettable Sulfur, Safer Garden Fungicide	Sulfur	M2
Bayer Advanced Garden Disease Control for Roses, Flowers, & Shrubs	Tebuconazole	3
Ferti-lome Halt Systemic Fungicide, Green Light Systemic Fungicide	Thiophanate-methyl	1
Ortho Rose Pride Rose & Shrub Disease Control	Triforine	3
Ziram 76 DF, Ziram granuflo	Ziram	M3
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