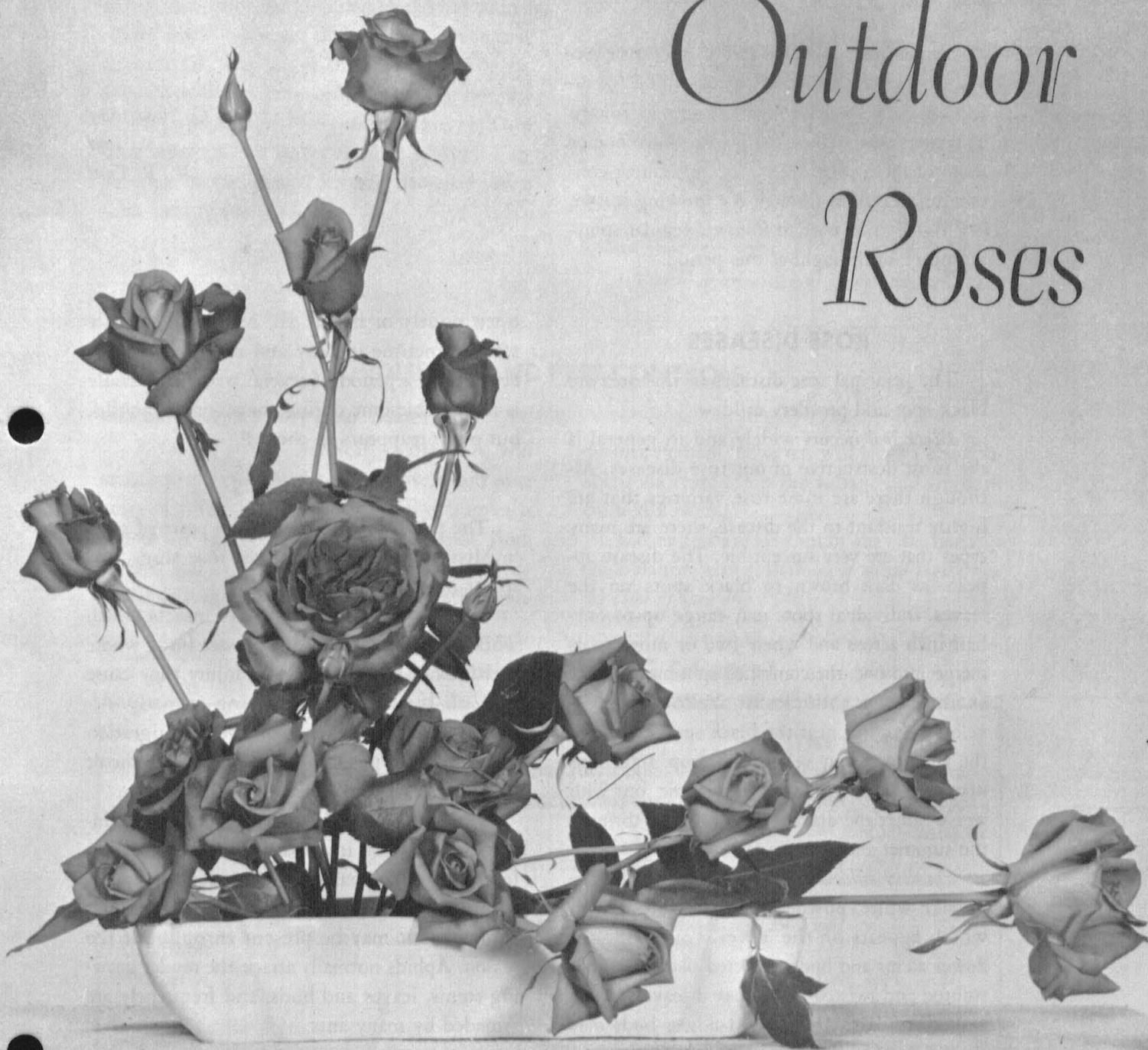


Spraying Outdoor Roses



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Garden roses in Missouri are subject to several diseases and to attack by a number of insect and mite species which damage the foliage or flowers and weaken the plants. Since one or more of these pests are present in almost continuous succession through the growing season, it is usually necessary to follow a regular spraying program throughout this period.

ROSE DISEASES

The principal rose diseases in this area are black spot and powdery mildew.

Black spot occurs widely and in general is the most destructive of our rose diseases. Although there are some rose varieties that are highly resistant to the disease, there are many types that are very susceptible. The disease appears as dark brown to black spots on the leaves. Individual spots may range up to one-half inch across and where two or more spots merge into one, the combined spot may involve as much as an entire leaflet. Yellow areas develop around or near the black spots and later the whole leaf may yellow and drop. Infections usually are heaviest in May and June, but with wet weather the disease may continue through the summer and into the fall.

Powdery mildew is easily recognized by the greyish-white, powdery or frost-like growth which appears on the leaves, young shoots, flower stems and buds. Affected plant parts are stunted and twisted and diseased leaves dry up and fall off. Heavily diseased flower buds may

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open poorly or not at all. Mildew generally starts sometime in May and may continue to develop for a period of several weeks. It usually is not troublesome during the summer months, but often reappears in the fall.

ROSE PESTS

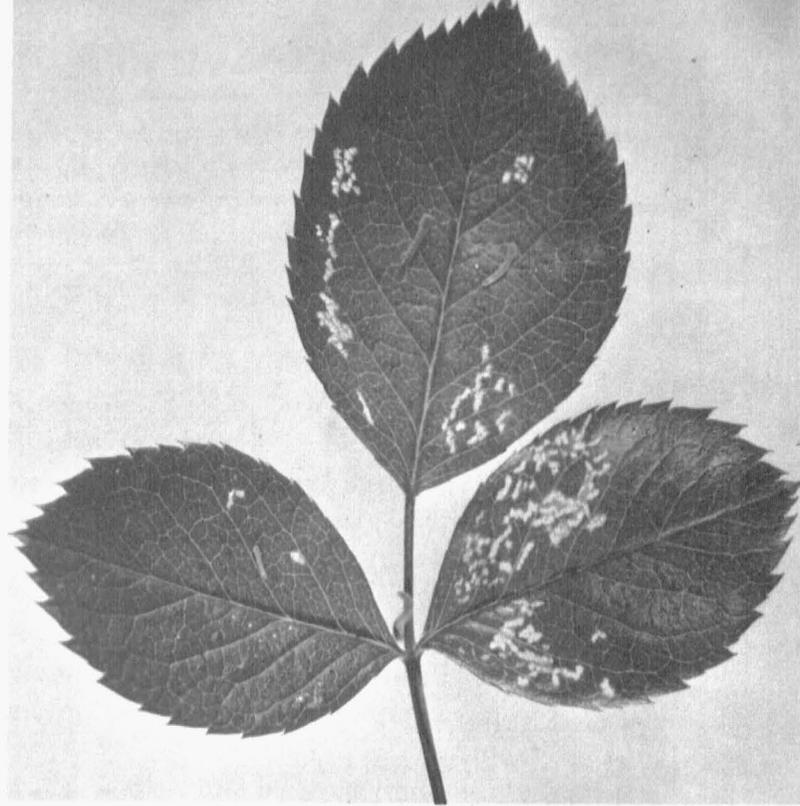
The principal insect and mite pests of roses in Missouri are thrips, aphids, rose slugs, and spider mites.

Thrips are very small, slender insects which work in the interior of the flower buds where they are not readily seen. The injury they cause prevents the buds from opening properly. Although easily killed, the continuous migration of thrips from plant to plant makes it difficult to keep roses free of them.

Aphids or plant lice are small sucking insects which work in massed groups. Aphid infestations are usually associated with damp, cool weather, primarily in the spring and late summer, but may be present throughout the season. Aphids normally attack the tender growing stems, leaves and buds, and frequently are attended by many ants.

Rose slugs are slow-moving, usually dark, worm-like creatures covered with a gelatinous sticky substance. They feed on the tender tissue between the leaf veins. The leaves turn brown and present a lacy appearance which to the untrained eye appears to be a diseased condition. Slugs are usually present in June, but may appear in May and continue into July.

Spider mites are so small that they are difficult to see with the unaided eye. They spin a silken thread wherever they go and with a heavy infestation, may cover the leaves with webs. Mites usually are pests only during the hot, dry part of the season (July and August.) They suck sap from the leaves causing a stippled appearance of the foliage. Severely damaged leaves soon turn brown and fall.



Typical injury caused by the rose slug.

DISEASE AND PEST CONTROLS

Black Spot, Insects and Mites

A single spray chemical, malathion, will satisfactorily control the major insect and mite pests of roses, while either ferbam or captan is satisfactory for the control of black spot. Both ferbam and captan appear to be safe on all varieties and under a wide range of weather con-

ditions. Ferbam, however, will leave a less conspicuous residue on the foliage and on dark colored flowers.

Either ferbam or captan may be used in combination with malathion *if mixed together at the time of spraying.*

Rate of Dilution and Spray Schedule

Material	1 gallon of Spray	Time to Spray
Malathion	5 level teaspoons	Apply at 8 to 10-day intervals beginning in late April or early May and continue to mid-June.
Ferbam	2 level tablespoons	
or Captan	5 level teaspoons	
	5 gallons of Spray	
Malathion	1/3 cup	After mid-June, spray at 2-week intervals to the end of the season.
Ferbam	1/2 cup	
or Captan	1/3 cup	

Left—Unsprayed Dorothy Perkins roses showing buds which never opened fully due to a heavy infection of powdery mildew. Right—Normal opening of the flowers after two applications of actidione had eradicated the disease.



Powdery Mildew

The antibiotic, Actidione, is the suggested material for the control of mildew on roses. It is further suggested that it be used only after mildew has appeared rather than in a regular program, and that it not be used in combination with other materials.

Actidione at a dilution rate of 1 part per million (1 ppm) is highly effective in stopping the development of mildew after the disease has appeared.

In presently prepared formulations which include a spreader-corrective, Actidione sprays leave no visible residues on the leaves or flowers. They may, however, at times cause some injury to the very young expanding leaves of certain varieties. The injury is in the form of a slight crinkling of the leaflets or as light colored spots, but it is usually almost, if not completely, outgrown by the time the flower buds are ready for cutting. The older leaves and flower buds are not affected.

Present information indicates that Actidione may be used any time during the growing season that mildew appears.

Rate of Use

For outdoor roses, Actidione should be used at the rate of 1 part per million. For preparations containing 0.5% Actidione, dilute as follows:

Water	0.5% Actidione	Spreader-corrective
1½ gallons	½ level teaspoon	8 level teaspoons
3 gallons	1 level teaspoon	5 level Tablespoons
6 gallons	2 level teaspoons	10 level Tablespoons (⅔ cup)
12 gallons	4 level teaspoons	1½ cup

Note: For Dorothy Perkins and other ramblers which are very susceptible to mildew, it is advisable to double the quantities of Actidione and the Spreader-Corrective.

Caution—Do not combine Actidione with other spray materials, but apply as a special spray.

Use standard measuring cups and spoons and measure accurately. Do not guess. In measuring spoonfuls, draw a straight edge across the top of the spoon so that it will be just level full.

Time and Manner of Application

It is not necessary or even desirable to apply Actidione sprays until mildew appears. When properly applied, it will stop the development of even a heavy mildew infection. But, better results are obtained and there is less mildew injury to the plants if an application is made before infection becomes general.

Apply thoroughly to both the upper and lower surfaces of the leaves, to the flower stems and flower buds. A complete wetting and matting down of the mildew growth is necessary in order to kill the causal organism.

One application often will arrest the development of rose mildew for several weeks. But, if spots reappear from which a white dusty substance can be blown or shaken, the plants should be resprayed in 8 to 10 days, repeating later as needed.