

# Xanthomonas Leaf Spot of Roses

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Bacterial leaf spots occur worldwide and are usually caused by the bacteria *Pseudomonas syringae* and *Xanthomonas campestris*, which can infect a wide range of host plants. Many plants in the Rosacea family, such as strawberry, Indian hawthorn, and peaches, are affected by bacterial leaf spots. *Xanthomonas* leaf spot of roses is a relatively new disease, first observed in Florida and Texas between 2004 and 2010. It has the potential to cause significant economic losses in commercial rose production.

## Cause

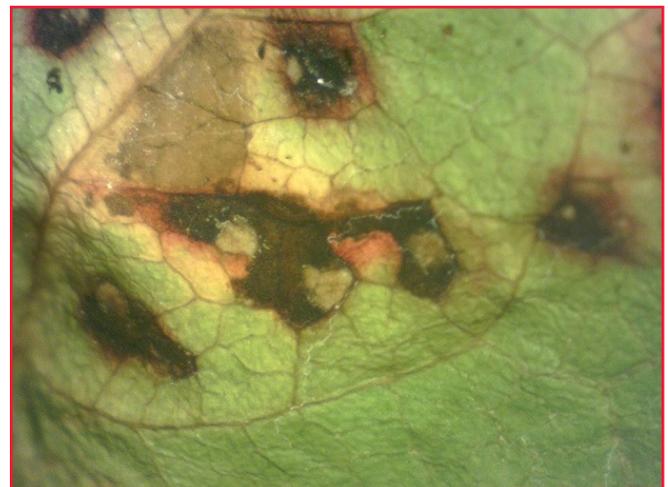
The bacteria that cause the disease, members of the genus *Xanthomonas*, are tiny microorganisms that can move short distances in water with the help of a single flagellum, a hair-like structure that acts as a propeller.

## Symptoms

*Xanthomonas* leaf spot may look different in various host plants, but some of the most common symptoms include the formation of spots between leaf veins (the centers of which may become necrotic and fall out) and a water-soaked appearance. The spots may occur in many parts of the plant, including the foliage and fruit, and lesions (cankers) may



**Figure 1.** Typical leaf symptoms for a bacterial infection include brown to black spots with a yellow halo around them. Source: Kevin Ong, Texas A&M AgriLife Extension Service



**Figure 2.** As the infection worsens, the spots merge, causing necrosis (death) on the leaf. A water-soaked appearance on infected leaves is also common. Source: Kevin Ong, Texas A&M AgriLife Extension Service

form on the stems. In roses, chlorotic (yellowed) halos (Fig. 1) typically surround the small, brown, angular to circular spots on the leaves. As the disease progresses and the bacteria grows, the spots enlarge (Fig. 2).

## Disease Movement

The pathogen's primary mode of transmission is splashing water, which allows it to spread to and infect new leaves. Disease development and incidence are much more common in the summer because of increased overhead irrigation, rainfall, and higher temperatures, which favor the growth of the bacterium. *Xanthomonas* cannot actively penetrate plant tissue and requires a natural opening such as a stoma or an open wound, to infect the host plant (Fig. 3). The pathogen survives the winter in dead plant material but cannot survive for long in water or soil alone.

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## Control

There are no bactericides to combat the pathogen. Preventive cultural methods such as proper sanitation and watering practices are the best way to control *Xanthomonas* leaf spot.



**Figure 3.** Because the bacterium spreads through water droplets, the spread of the disease often appears random, based on which leaves the bacterium lands on and starts an infection. *Source: Kevin Ong, Texas A&M AgriLife Extension Service*

### Watering:

- Avoid mechanical injury to the plants to minimize unnecessary wounding, which provides a point of access for the bacterium.
- Water the garden in midmorning and avoid over-watering so the foliage can dry rapidly, removing the medium (water) that transmits the bacteria.

### Sanitation:

- Remove infected plants promptly and clean out plant debris from the garden.
- Avoid planting susceptible varieties such as Lenten rose. Ask local growers or AgriLife Extension agents for information about resistant varieties.

Chemical treatments work best as a preventive measure. Copper-based plant protection products have bactericidal activity (kill bacteria) and can be effective. Disinfection products that contain hydrogen peroxide or quaternary ammonia are also available. To avoid phytotoxicity issues, refer to product labels for proper use and rates. Biological antagonists (beneficial bacterium) can help manage this problem since products that contain *Bacillus* sp., such as Cease and Triathlon, compete with the pathogen and protect the rose. Read the labels and carefully follow the directions for these products.

## Sources

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