



## BACTERIAL LEAF SPOT OF BEGONIA

Begonias (*Begonia* spp.) are tropical plants cultivated as houseplants or as edging in a garden for their handsome, succulent, often varicolored leaves and waxy flowers. Most begonias are grown as flowering pot plants, but the Rex begonia (*Begonia rex-cultorum*) is grown primarily for its brightly colored, variegated foliage. Begonias range in height from 5 to 16 inches tall. They do best in cool temperatures (about 70°F or 21°C) when grown in moderate shade in a well-drained moist soil (or mix) high in organic matter. Begonias are sensitive to soluble salts and are subject to a few troublesome diseases. One of the most common and wide-spread diseases is bacterial leaf spot or blight caused by *Xanthomonas campestris* pv. *begoniae*.

Bacterial leaf spot was reported in Europe in 1928, and in the United States in 1939. Since then it has been reported wherever begonias are grown. The disease occurs on Rieger Elatior, Lorraine Elatior, tuberous, fibrous-rooted, and Rex begonias, with the most severe problems on Rieger Elatiors. The disease has been recorded on *Begonia alba*, *B. cucullata* var. *hookeri*, *B. x drostii*, *B. elatior*, *B. gracilis*, *B. x pictavensis*, *B. rex-cultorum*, *B. sacrotrana*, *B. schmidtiana* var. *orosea*, *B. semperflorens-cultorum*, and *B. tuberhybrida*. Begonia species, and their many horticultural cultivars, are the only natural hosts. The disease can be particularly damaging in nurseries and greenhouses when plants are crowded together under high humidity and where overhead watering is practice.

### SYMPTOMS

Minute, scattered, circular to angular, glazed, blisterlike lesions first appear on the underside of older leaves close to the margins or the main veins. As the spots age they become roughly circular, brown, more conspicuous, and appear translucent when a leaf is held up to the light. The lesions gradually enlarge up to 5 millimeters in diameter, tend to merge, and dry to form large, irregular, brown papery



Figure 1. Bacterial leaf spot on the upper surface of a begonia leaf. Note the yellow "Halos" around the lesions.



Figure 2. Lower surface of begonia leaf infected with bacterial leaf spot. Control by surface or bottom watering, keep the humidity below 80 to 85 percent, space plants, and practice strict sanitation.

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blotches with narrow, yellow, translucent margins or “halos”, which are visible on both leaf surfaces (Figures 1 and 2). Under moist conditions the lesions usually appear dark green and water-soaked. Occasionally a yellow ooze that dries into a shiny film can be seen on dry specimens. When lesions are numerous, infected leaves often wilt, wither, and drop prematurely. The margins of lesions on Rex and other begonias are characteristically wavy and irregular. Many lesions form around the leaf margins when infections occur through the hydathodes (Figure 3). On some hosts the lesions become V-shaped with a few discrete lesions forming in the leaf blade. Chlorotic zones may be present around the necrotic areas.



*Figure 3. Upper surface of a begonia leaf showing mostly hydathode infections caused by the bacterial leaf spot organism (courtesy R.K. Jones).*

On the stems and petioles, dark green to brown water-soaked streaks appear which are approximately 5 millimeters long by 1 millimeter wide. These lesions enlarge, turn brown, and commonly have a central longitudinal split. In severe cases the main stem may be invaded by the bacteria, resulting in a gradual softening of all tissues. Entire plants may wilt, collapse, and die when infections become systemic within the water-conducting tissue. Rex begonias are very resistant to systemic infection.

## **DISEASE CYCLE**

The causal bacteria remain viable at least 3 months in yellow ooze on the surface of dried leaves and for at least a year in fallen leaves. The leaves become infected under moist conditions through hydathodes at the leaf margins, stomates on the bottom of the leaf (Figure 2), and wounds. Rapid spread of the disease occurs when plants are crowded together under conditions of high humidity. Warm (80° to 90°F or 37° to 32°C), moist, poorly ventilated conditions favor rapid development of the disease. The bacteria are transmitted from leaf to leaf and plant to plant primarily by water splash and by careless handling of infected plants.

## **CONTROL**

1. Propagate only with cuttings taken from **disease-free stock plants** or purchase only certified, disease-free cuttings and plants from a reputable commercial propagator.
2. Plant **only** in pasteurized soil.
3. Keep cuttings and potted plants widely spaced in a greenhouse free of plants infected with bacterial leaf spot.
4. Practice **only** surface or bottom watering. Avoid splashing water on the foliage. Avoid syringing the plants lightly with water, especially at high temperatures. If overhead watering is necessary, water in the morning on a rising temperature so the foliage will dry quickly.
5. Keep the humidity in the greenhouse at 85 percent or lower by increasing air circulation and adding heat as temperatures drop to prevent moisture condensing on the foliage. Keep the temperature as low as practical for good plant growth.

6. Spotted leaves should be carefully removed, placed in a plastic bag, and burned. Disinfect cutting knives with 70 percent rubbing alcohol before using on other plants. Remove and destroy severely infected plants together with the soil attached to the roots.
7. If disease is seen, carefully remove slightly infected plants and quarantine them in another greenhouse.
8. The spread of the disease can be prevented provided the cultural practices outlined above (1-7) are routinely practiced. Copper fungicides have given some control when plants are sprayed thoroughly and repeatedly. For details refer to Illinois Commercial Landscape and Turfgrass Pest Management Handbook or the Illinois Home, Yard and Garden Pest Guide. Avoid unnecessary pesticide applications which may spread the bacteria from plant to plant.
9. There are no known highly resistant begonia cultivars.

Publications mentioned above are available at your nearest Extension office or at ITCS, University of Illinois P345, 1917 S. Wright St., Champaign, IL 61820.