



COMMON LEAF DISEASES OF ZINNIA

Zinnias (*Zinnia elegans*) are one of the most popular summer- and autumn-flowering plants. Three common leaf spot diseases mar the beauty of this bedding plant. All three diseases are favored by warm, wet or very humid weather, overhead sprinkling, excess shade, and crowding of plants.

ALTERNARIA LEAF SPOT OR BLIGHT

This widespread and disfiguring disease is caused by the fungus *Alternaria zinniae*. The causal fungus also infects other plants such as China aster, lettuce, sunflower, tobacco, and tomato. The *Alternaria* fungus overwinters on seed and in soil.

Small, round, reddish brown spots with white to grayish white centers form on the upper leaf surface. Later, the lesions become fairly large (up to 10 mm in diameter), irregular, dark reddish brown or purple, and dry (Figure 1). The center of an older spot may drop out leaving a ragged hole. Heavily infected leaves turn brown and dry. The dead tissue has a tendency to crack and tear during wind and rain storms. Similar spots form on the petioles and on the stems at or between the nodes. The lesions may girdle the stem, often at a node, causing the upper portion of the plant to wilt and die back. Dark brown to black cankers with sunken centers are common near the soil line. Affected plants often wilt even when the basal cankers do not completely encircle the stem.



Figure 1. *Alternaria* leaf spot or blight (R.K. Jones, NC State photo).



Figure 2. *Alternaria* flower blight (J.L. Forsberg photo).

Infected roots may turn dark gray, rot, and slough off resulting in wilting and death of the plant. Seedlings may also wilt and collapse (damp-off). Small (1 to 2 mm) but enlarging brown spots, sometimes with grayish white centers, appear on the petals of the ray flowers. The lesions may enlarge and involve entire petals, causing an unsightly blighting of the flowers (Figure 2).

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CERCOSPORA LEAF SPOT

This disease, which very closely resembles *Alternaria* leaf spot, is caused by the fungus *Cercospora zinniae*. It sometimes occurs together with *Alternaria zinniae* on the same leaf.

Fairly large, almost round, reddish brown or dark purple spots, with a light gray or even white center, form in the leaves (Figure 3). As with *Alternaria* leaf spot, the center of the lesion may fall out leaving a hole. Severely infected leaves turn brown and dry. The dead tissue may crack and tear.

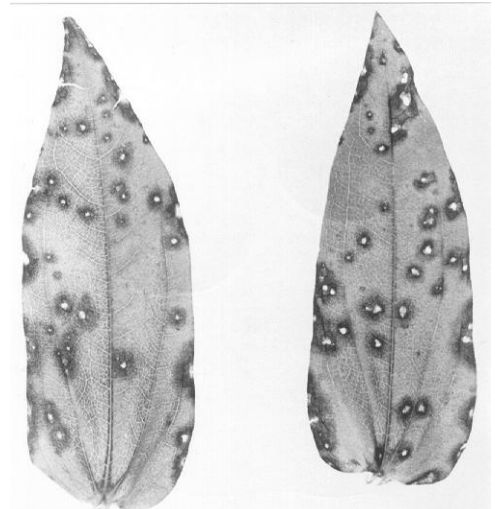


Figure 3. *Cercospora* leaf spot (Florida Dept. of Agriculture, Division of Plant Industry photo).

BACTERIAL LEAF SPOT

This disease is caused by the bacterium *Xanthomonas campestris* sub. Sp. *zinniae*. It first appears as small (1 to 2 mm), diffuse, translucent spots surrounded by broad yellowish halos. Under wet conditions the lesions slowly enlarge to about 5 mm in diameter. The spots become angular to irregularly circular and develop a reddish center. The lesions may merge to form irregular dead areas, 0.5 to 1.0 cm long, that may crack as they dry (Figure 4). During very humid weather, small brown spots may form on the ray flowers. If severe, the flower heads are seriously disfigured and may completely decay.

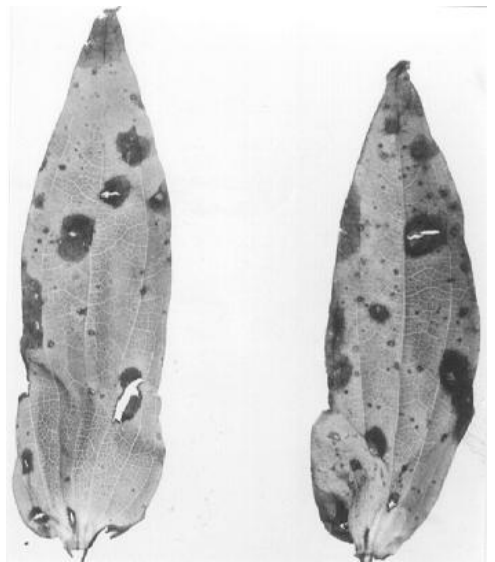


Figure 4. Bacterial leaf spot showing large areas of decaying tissue (Florida Dept. of Agriculture, Division of Plant Industry photo).

Control

1. Purchase only disease-free, healthy transplants or start with fresh, disease-free seed. If unsure about the seed, it can be freed of *Alternaria* and *Cercospora* by soaking in hot water (125°F) for 30 minutes before planting. Immediately after treatment, plunge the seed into cold water and dry completely before planting. Seed over a year old may be severely injured by this treatment. Seed suspected of being infected with the bacterial leaf spot organism may be soaked for 2 minutes in a household bleach solution (0.52 percent sodium hypochlorite; 10 percent Clorox) just before planting. After the hot water or household bleach soak, treat the seed with a captan seed protectant fungicide. The captan will aid in preventing damping-off.
2. Plant in full sun or semi-shade in a deep, rich, fertile soil that has been well prepared. Fertilize before planting based on a soil test.
3. Space plants for good air circulation based on maturity. Giant forms of zinnias, which grow up to 3 feet high, should be planted 1 ½ to 2 feet apart; the free-flowering, smaller-flowered Lilliputian varieties, which grow up to 18 inches tall, may be planted 1 foot apart.

4. Thoroughly water plants in hot dry weather being careful to keep the water off the foliage. An organic mulch around the plants will help to retain moisture and keep the soil from packing during heavy rains or watering.
5. Practice thorough sanitation. Collect all crop debris after the growing season is over. Burn or compost this plant refuse.
6. Grow zinnias in the same area only once in 3 years.
7. Control *Alternaria* and *Cercospora* leaf spots by thoroughly spraying seedlings and young plants with a protective fungicide at about 7- to 14-day intervals during warm, wet, or very humid weather. Be sure to cover the underleaf surfaces with each spray. Applications should begin just before or when the first disease symptoms appear. Fungicide recommendations for zinnias are given in Illinois Commercial Landscape and Turfgrass Pest Management Handbook or Illinois Home, Yard, and Garden Pest Guide.