

Angular Leaf Spot of Cucurbits

Symptoms

Angular leaf spot affects aerial parts of cucurbits including leaves, petioles, stems and fruits. First symptoms include small, round to irregular, water-soaked lesions. The lesions may or may not have a halo. Foliar lesions become angular as they grow (vein limited), and tan to brown in color when mature (Fig. 1).



Fig.1. Angular leaf spot of cucumber. Photo: Charles Averre, North Carolina State University, Bugwood.org

Mature lesions may tear apart and drop, leaving a hole (Fig. 2).



Fig.2. Angular leaf spot of cucumber. Photo: Charles Averre, North Carolina State University, Bugwood.org

Fruit lesions are usually circular and smaller than foliar lesions, and can either cause fruit drop, deformation, or superficial whitish cracked lesions. Internal rot may develop when secondary pathogens enter through the cracked lesion surface. Under humid conditions, bacteria ooze from the lesions as a milky exudate that dries and forms a whitish crust.

Causal Agent

Angular leaf spot is caused by the bacterium *Pseudomonas syringae* p.v. *lachrymans*. The bacterium affects cucurbits such as cucumber, zucchini, squash, melons, and pumpkins.

Inoculum Source and conditions

The bacteria over-winter in plant residues or seeds, and spread by free water provided either by rain or irrigation. Insects, harvesters, and farm equipment also contribute to secondary spread of the disease already established in the field. The bacterium enters the plant through natural openings (stomata, hydathodes) or wounds. Seedborne bacteria spread to the cotyledons when the seed germinates. The disease is favored by high humidity and warm temperatures (between 75°F and 82°F). The disease can be favored by high levels of nitrogen.

Management

Use plant pathogen-free seed or varieties that have tolerance. Plow under residue to lower inoculum levels. Rotate to non-host crops for three or more years. Limit overhead irrigation, and handling of wet foliage. Avoid excessive nitrogen fertilization. Schedule preventive weekly treatment with fixed copper compounds, when conditions are favorable for disease development. Apply insecticides to protect from insect wounds. Minimize fruit wounds at harvest.

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