THE UNIVERSITY OF ARIZONA
Cooperative Extension

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Alternaria Leaf Spot of Cotton

Jiahuai Hu and Randy Norton

Necrotic lesions surrounded by purple halo margin

Necrotic lesions on bolls and bracts

INTRODUCTION: Alternaria leaf spot of cotton is also known as Alternaria leaf blight. The disease was first identified in cotton in the US in 1918 and is now distributed worldwide. Alternaria leaf spot has been considered a minor disease in the cotton growing areas of Arizona. The disease is frequently associated with senescing tissue of cotton under physiological stress (heavy boll load) or nutritional stress (potassium deficiency) late in the growing season. On rare occasion it can also affect seedlings. In recent years, several disease outbreaks that led to severe defoliation in late-season cotton were reported from Graham County. The disease can severely affect susceptible Pima cotton varieties and also attack upland cotton varieties. Susceptible varieties have had nearly 100% of leaves infected in years when weather conditions are conducive for disease infection and development. The impact on yield in Arizona was estimated to be 10% to 15% in highly susceptible cotton varieties.

PATHOGEN: *Alternaria macrospora, Alternaria alternata* (fungus: *Ascomycetes)*

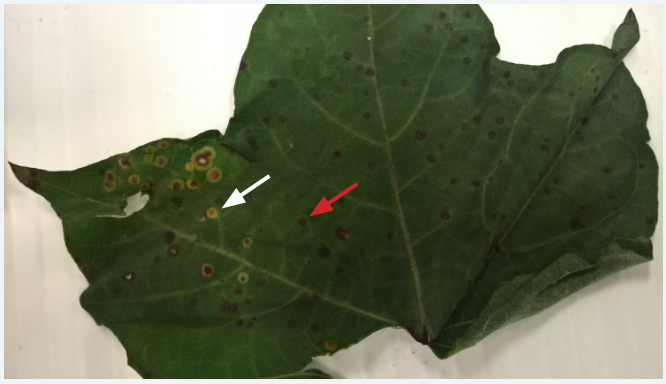
HOST RANGE: Alternaria in general has a wide host range, causing leaf spots and blights on many plant species. The fungus is saprophytic and commonly found colonizing many kinds of dead or dying plant materials.

DISEASE CYCLE: The fungus overwinters in infected crop residues and other alternate host plants. The conidia are produced on fallen dead leaves under high humidity. These asexual spores of the fungus are thick-walled (resistant to adverse conditions), multicellular, and pigmented. The fungus are spread long distance by contaminated seeds or airborne conidia spores or short distance by water splash of fungal spores. Temperatures of 68-83°F and free surface water (rainfall or dew) are required for infection.

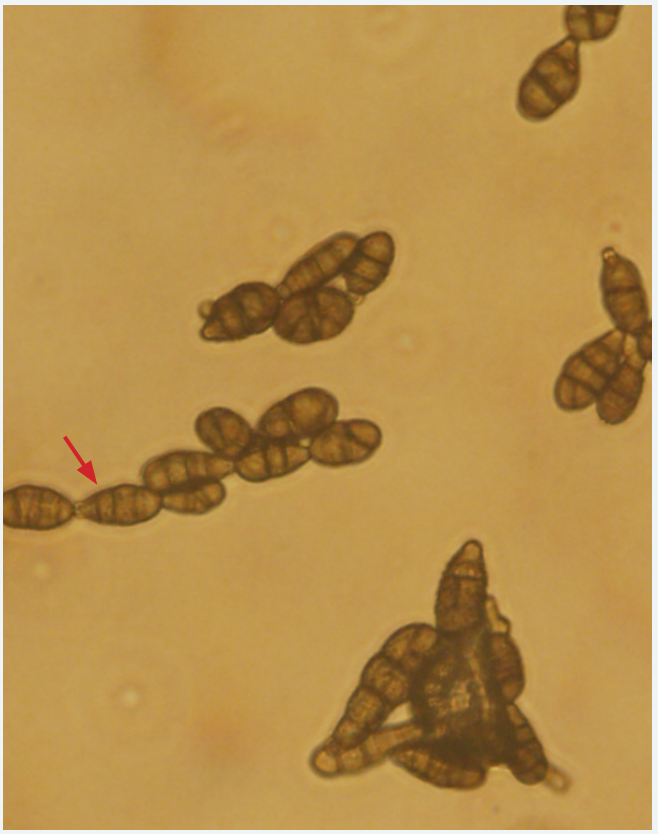
SYMPTOMS AND DIAGNOSIS: Symptomology can be observed on cotyledons, leaves, stems, flower buds and bolls. Initial symptoms are small, circular, brown necrotic lesions with a purple halo (1-3mm). As the lesions grow, they may coalesce and become irregular spots. The center of these lesions turn gray, dry and can detach from the leaf (giving a "shot-hole" appearance). A black, sooty appearance may occur under high humidity. Severely affected leaves drop under severe conditions, the plant may become completely defoliated. For a definitive diagnosis, symptomatic tissue should be collected and wrapped in a dry paper towel, placed in a plastic bag, and shipped OVERNIGHT to the University of Arizona's Extension Plant Pathology Laboratory in Tucson. All submissions should be accompanied by a completed Plant Disease Diagnostic Form.

SYMPTOMS CAN BE CONFUSED WITH: Southwest cotton rust. If you have any questions regarding this and other cotton diseases, contact your local extension office or Randy Norton (e-mail:rnorton@arizona.edu; phone: 928-651-0420) or Alex Hu (e-mail:epp@arizona.edu; phone:863-594-0505).

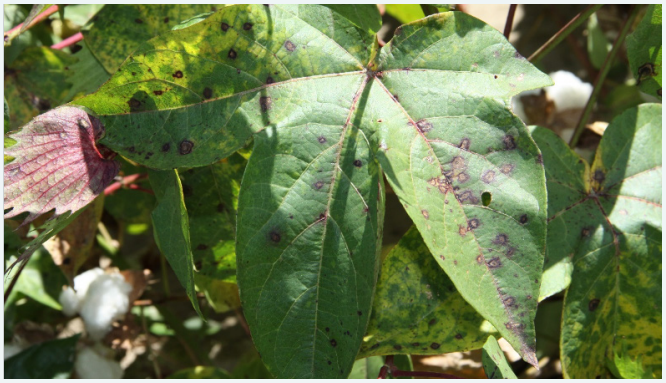
Shot-hole appearance after center of lesion is detached



lesions of Alternaria (red arrow) and Southwest cotton rust (white arrow, yellow halo)



Asexual spores (conidia):thick-walled, multicellular, and pigmented; conidia chain (arrow)



Shot-hole appearance after center of lesion is detached

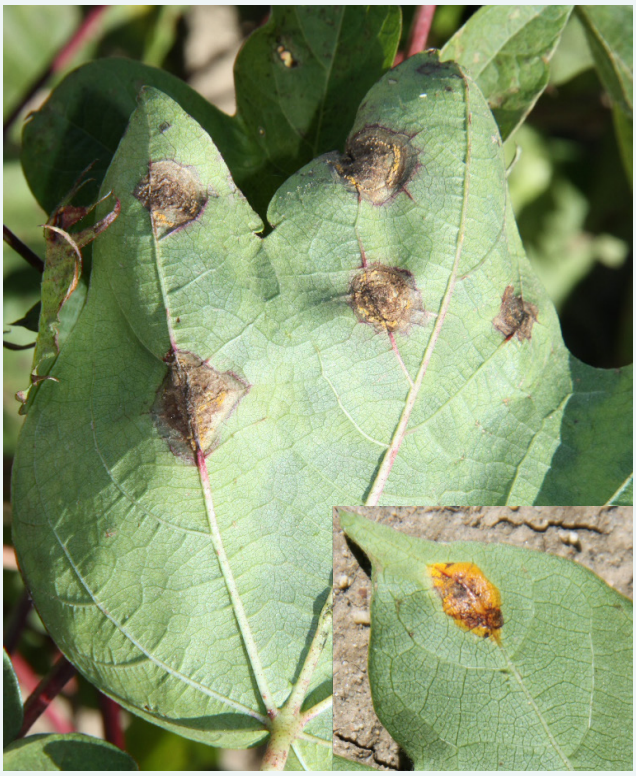
Necrotic lesions on the lower leaf surface

Severely infected cotton in the late season

Areas of field with higher disease severity

Fields planted with susceptible and tolerant hybrids with obvious differences in the extent of blighted leaf area

Lesions of southwest cotton rust (red arrow) and Alternaria leaf spot (white arrow)



Rust pustules on lower leaf surface (Yellow orange)

MANAGEMENT: Intervention is rarely needed unless the disease starts in early- or mid-season cotton and favorable weather conditions are predicted. In general, Alternaria leaf spot disease can be mitigated by: 1) plant resistant cultivars in fields with a history of the disease; 2) remove and destroy the infected crop residues; 3) till to bury and break down infected crop residues; 4) reduce plant stress and maintain good soil fertility; and 5) preventative fungicide spray in severe defoliation case: systemic strobilurins (Headline and Quadris), triazole fungicides (tebuconazole and difenoconazole) as well as protectant fungicides (mancozeb) are effective.

REFERENCES:

Cotty, P.J. 1987. Evaluation of cotton cultivar susceptibility to Alternaria leaf spot. Plant Dis. 71:1082-1084

Zhu, Y. et al. 2019. Etiology of Alternaria leaf spot of cotton in Southern New Mexico. Plant Dis. 103:1595-1604

THE UNIVERSITY OF ARIZONA
Cooperative Extension

The University of Arizona
College of Agriculture and Life Sciences
Tucson, Arizona 85721

AUTHORS

Dr. Jiahuai Hu
Assistant Cooperative Extension Specialist and Plant Pathologist, School of Plant Sciences

Randy Norton
Director - Graham County Extension

CONTACT
Jiahuai Hu
epp@email.arizona.edu

This information has been reviewed by University faculty.
extension.arizona.edu/pubs/az1854-2020.pdf

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