

# Angular Leaf Spot of Dry Beans

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L. P. Hart, A.W. Saettler, and Fernando Correa

Extension Specialist, USDA/ARS Plant Pathologist, and  
Graduate Research Assistant, Department of Botany and Plant Pathology

Angular leaf spot is caused by the fungus *Isariopsis griseola*. Although generally rare in Michigan, angular leaf spot was especially severe in 1982 and 1983 on the Montcalm red kidney variety in the bean seed growing areas in Alpena and Presque Isle Counties.

## SYMPTOMS

Symptoms are generally evident at late flowering or early pod fill. Leaf lesions, initially gray or brown, become necrotic and well defined with the typical angular shape occurring by 9 days after infection (Figs. 1, 2 and 3). Plant stems, petioles and branches may also be infected (Fig. 4). Pod lesions are oval to circular with reddish-brown centers surrounded by darker colored borders (Fig. 5). Infected pods may contain poorly developed or entirely shriveled seeds, and the fungus can be carried on or in the seed.

Symptoms of the fungus-caused angular leaf spot disease on the Montcalm red kidney variety are easily confused with those symptoms associated with common and halo bacterial blights. However, separation of the diseases is easily made by looking for the fluffy growth of the fungus (synnemata which bear spores) in the lesions on the underside of the leaf (Fig. 6). Also characteristic are the small, black, pinpoint spore masses on the undersurface of the leaf. Positive diagnosis should be made by MSU extension specialists through the MSU diagnostic laboratory since angular leaf spot, unlike common blight, can be controlled with fungicides if detected early.

*Isariopsis griseola* overwinters in crop debris in tropical and sub-tropical climates. It is not known, however, whether this fungus overwinters on crop debris in Michigan. Still, severely infected fields should be rotated out of susceptible bean crops for at least one year. Of the various commercial classes of dry beans, red kidney and cranberry are most susceptible (Table 1). However, until more is known about this disease, rotation to another crop is recommended.

The fungus has been identified on seed used for planting. Therefore, seed treatment with the standard combination of fungicide, antibiotic, and insecticide is recommended.

Application of a fungicide to the foliage of bean plants may be beneficial if applied early. Once infec-



Figure 1. Early symptoms showing gray discoloration and spore-bearing synnemata.



Figure 2. Angular appearance of lesions.



Figure 3. Necrotic lesions on leaves. Extensive early defoliation has occurred.

tions are well advanced, fungicides will be of little benefit. Fungicide spray trials have not been done in Michigan, but benomyl and thiophanate methyl reportedly control angular leaf spot. Fungicides should be used only when the disease is positively identified as angular leaf spot, and only when it is detected early.

**Table 1. Reactions of Commercial Dry Bean Cultivars to Angular Leaf Spot caused by *Isariopsis griseola*.**

| Cultivar          | Reaction | Cultivar          | Reaction |
|-------------------|----------|-------------------|----------|
| <b>WHITE NAVY</b> |          | <b>RED KIDNEY</b> |          |
| Fleetwood         | R        | Charlevoix        | S        |
| Neptune           | R        | Isabella          | S        |
| Nep-2             | R        | Montcalm          | S        |
| Seafarer          | R        | Red Cloud         | S        |
| Swan Valley       | R        | Sacramento        | S        |
| Tuscola           | R        |                   |          |
| C-15              | I        |                   |          |
| C-20              | R        |                   |          |
| <b>BLACK</b>      |          | <b>PINTO</b>      |          |
| B-190             | R        | Olathe            | R        |
| Black Beauty      | R        | UI-III            | R        |
| Black Magic       | R        |                   |          |
| Black Turtle Soup | R        | <b>OTHER</b>      |          |
| Domino            | R        | Mich. Improved    |          |
| Midnight          | R        | Cranberry         | S        |

R = Resistant

I = Intermediate

S = Susceptible



Figure 4. Stem lesions on defoliated branch.



Figure 5. Comparison from top to bottom of severely infected, mildly infected, and healthy pods.



Figure 6. Upper and lower leaf surfaces with angular lesions. Spore-bearing synnemata occur throughout the necrotic tissue.

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Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8, and June 30, 1914, in cooperation with the U. S. Department of Agriculture. Gordon E. Guyer, Director, Cooperative Extension Service, Michigan State University, E. Lansing, MI 48824.

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