

AG FACTS

Dry Bean Diseases

L. Patrick Hart, Alfred W. Saettler and Joseph L. Clayton
 Dept. of Botany and Plant Pathology

This bulletin provides useful information for diagnosing crop disease problems in the field or in the plant clinic laboratory. It will assist crop disease consultants, their scouts, state agricultural advisers, agribusiness representatives, pest control dealers and applicators, county agricultural agents, students in plant sciences and growers throughout Michigan.

The descriptions of symptoms, environmental conditions favoring disease, methods of transmission and recommended control are brief, but complete. The calendar indicates the month in

which symptoms appear and the plant part showing the symptom. More detailed information, including photos of disease symptoms, is available in dry bean Extension bulletins. Contact your county Cooperative Extension Service office or the MSU Bulletin Office to obtain these publications.

For information on resistant hybrids and varieties, chemical control and other measures, consult recent literature, competent area specialists, Extension plant pathologists or informed seed suppliers.

DRY BEAN DISEASES

DISEASE	MONTH SYMPTOMS APPEAR				ROOT	PLANT PART SHOWING SYMPTOMS				
	JUNE	JULY	AUG.	SEPT.		LEAF	STEM	POD	SEED	FLOWER
Root Rots	•	•	•	•	•	•	•	•	•	•
White Mold		•	•	•		•	•	•	•	•
Common Bacterial Blight		•	•	•		•	•	•	•	•
Halo Blight	•	•	•			•	•	•	•	•
Anthraxnose		•	•			•	•	•	•	•
Angular Leaf Spot		•	•	•		•	•	•	•	•
Bean Rust		•	•	•		•				
Bean Common Mosaic Virus	•	•	•			•				
Air Pollution		•	•			•				

DRY BEAN DISEASES

DISEASE	SYMPTOMS	ENVIRONMENTAL CONDITIONS FAVORING DISEASE		METHOD OF TRANSMISSION	RECOMMENDED CONTROL	SPECIAL NOTES
<p>Root Rots (<i>Rhizoctonia solani</i>, <i>Fusarium solani</i>, <i>phaseoli</i>, <i>Pythium</i> spp.)</p>	<p>Reddish-brown to dark areas appear on taproot at or below the soil line; stunted plants may turn yellow.</p>	<p>Plant stress.</p>	<p>Spread is not a factor, because the fungi live in the soil and attack roots during favorable weather conditions.</p>	<p>Rotate crops; supply adequate irrigation; minimize soil compaction by subsoling; treat seed for seed decay and seedling blight.</p>		
<p>White Mold (<i>Sclerotinia sclerotiorum</i>)</p>	<p>First symptoms are small, soft, watery spots on stems, pods and leaves; spots enlarge to a rotted, watery mass often covered by white, moldy growth; plants wilt and die; stems and pods contain small, black fruit-bodies; crop seeds are a chalky color and light weight.</p>	<p>Long hours of dew or light, frequent rains, lush, viny growth and late irrigation.</p>	<p>Fungus survives in soil and on crop residue as sclerotia. Sclerotia mix with seed and spread during plowing and harvesting; spores are wind-borne.</p>	<p>Obtain partial control by applying fungicide at early to full bloom. Plant in well-drained fields. Grow bush varieties, plant certified seed in 20 to 30 in. rows.</p>		
<p>Common Bacterial Blight (<i>Xanthomonas phaseoli</i>)</p>	<p>Brown, necrotic lesions surrounded by a bright yellow halo at the margin or interior of the leaf appear. Pod lesions appear as small, brown, "scabby" spots.</p>	<p>Warm, wet weather.</p>	<p>Bacteria are seed-borne and spread by rain, hail, wind, small animals, insects and may survive in plant debris in the soil for 1 year. Infection occurs through stomata, wounds, sucking insects or mechanical injury.</p>	<p>Plant disease-free seed (blight tested); treat seed with a bactericide. Practice a 2- to 3-year rotation; isolate fields; use herbicides; limit field traffic.</p>	<p>Lesions enlarge rapidly to cover most of a leaf.</p>	

DRY BEAN DISEASES *Continued*

DISEASE	SYMPTOMS	ENVIRONMENTAL CONDITIONS FAVORING DISEASE	METHOD OF TRANSMISSION	RECOMMENDED CONTROL	SPECIAL NOTES
Halo Blight (<i>Pseudomonas phaseolicola</i>)	Small, water-soaked spots turn to reddish-brown lesions surrounded by a large greenish-yellow halo; water-soaked spots appear on pods; infected seeds shrivel and change color.	Cool temperatures early in the growing season.	Seed-borne; infection occurs through natural leaf openings, wounds created by hail, blowing soil particles, sucking insects and mechanical injury.	Plant disease-free seed treated with a bactericide; practice a 2- to 3-year crop rotation program; isolate bean fields; use herbicides; limit field activity; use copper spray to control halo blight.	
Anthraxnose (<i>Colletotrichum lindemuthianum</i>)	Dark brown to black lesions appear along leaf veins on the underside of leaves; leaf petioles and stems may also show this symptom. Circular reddish-brown to black lesions occur on pods; spots develop sunken centers as lesions enlarge; the centers are brown. Pink to flesh colored fruiting structures containing spores quickly replace dead tissues.	Hot, humid conditions after mid-season.	Seed-borne; infected seed is the primary source of inoculum. The fungus may overwinter in Michigan soils.	Use multiple race resistant varieties, plant treated, disease-free seed; rotate out of beans for 1 year; if anthracnose is evident, use fungicides, depending on disease severity, crop maturity and weather.	
Angular Leaf Spot (<i>Isariopsis griseola</i>)	Gray or brown leaf lesions become necrotic and angular shaped. Pod lesions are oval to circular with reddish-brown centers and darker borders. Montcalm red kidney shows fluffy growth of the fungus (synnemata) and black spore masses in the lesions on the underside of leaves.	Cool, moist weather (68° to 75°F).	Seed-borne; fungus overwinters on crop debris.	Plant disease-free seed treated with a fungicide, antibiotic, and insecticide. Rotate away from beans at least 1 year; apply a fungicide to bean foliage early. Have a specialist positively identify the disease before you spray.	Primarily a problem on colored beans.

DRY BEAN DISEASES *Continued*

DISEASES	SYMPTOMS	ENVIRONMENTAL CONDITIONS FAVORING DISEASE	METHOD OF TRANSMISSION	RECOMMENDED CONTROLS	SPECIAL NOTES
Bean Rust (<i>Uromyces phaseoli</i>)	Lower leaf surfaces develop small, white, slightly raised spots that enlarge until yellow, chlorotic spots appear on upper surfaces. The lower surfaces opposite chlorotic areas, mature, reddish-brown pustules form, rupture and release many spores.	Cool nights, warm days; free water on the leaves for 10 to 15 hours.	Wind-borne spores; new pustules are produced every 10 to 15 days; fungus overwinters on crop debris.	Use a 2-year rotation program away from beans; avoid planting beans adjacent to rust-infected bean fields; clean plow; plant beans early in June; apply foliar fungicides; use resistant varieties; and closely examine pintos.	
Bean Common Mosaic Virus (BCMV)	Two types: 1) typical leaf mosaic mottling and 2) systemic necrosis, including black root and local lesions. Type depends on variety, time of infection, strain of BCMV and environmental conditions. Other symptoms include alternating patterns of light and dark shades of green on leaves; mottling, curling, malformation of leaves. Leaves are longer and narrower than healthy leaves.	Hot weather conditions that favor high aphid populations.	Seed and pollen, insect vectors (mainly aphids), machinery, and infected seeds of plants with susceptible varieties.	Plant resistant varieties; use clean, virus-free seed.	
Air Pollution Injury (Bronzing)	Small, dead areas occur on the upper leaf surfaces; leaves appear stippled and lesions coalesce to a burned or bronzed appearance.	Hot, sunny weather.	Noninfectious disease; does not spread.	Plant resistant varieties.	

See also Extension bulletins E-680, *Bacterial Blight of Beans*, E-892, *White Mold of Beans*, E-893, *Bean Rust*, E-1561, *Bean Common Mosaic Virus*, E-1567, *Air Pollution (Bronzing) in Dry Beans* and E-1671, *Bean Anthracnose*.



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