

Dry Bean

Bacterial Brown Spot

Howard F. Schwartz, David H. Gent, Gary D. Franc and Robert M. Harveson

Identification and Life Cycle

Bacterial brown spot is caused by the bacterium *Pseudomonas syringae* pv. *syringae*. The pathogen can be found on the leaves of many plants, but only causes disease on a few hosts in the High Plains region. Infection occurs when bacterial cells are deposited onto leaves by splashing water, aerosol movement, or from contaminated seed and multiply to form large populations. The bacteria gain entry into plants through natural openings and wounds. Infection occurs most readily during cool (less than 85°F), wet weather, especially hard, wind-driven rains. Bacteria are disseminated within and among fields by splashing water, aerosols, and on contaminated equipment and workers. The pathogen survives between susceptible hosts in and on weeds such as hairy vetch, infested crop debris and contaminated seed.

Plant Response and Damage

Lesion size varies, but lesions are usually small and brown, surrounded by a narrow yellow zone. Water-soaked tissue may not be noticeable, but if present appear as small circular spots on the lower leaf surface. The centers of old lesions fall out, leaving tattered strips or holes on affected leaves. If the disease becomes systemic in the plant, lesions can occur along the stem. Pods from infected plants may be bent or twisted with visual ring spots. Water-soaked brown lesions can form on pods. Older plants and plant parts are more resistant to infection. The disease can reduce both seed yield and quality, and can be very damaging when weather conditions are favorable to the pathogen.

Management Approaches

Biological Control

No biological control strategies have been commercialized for bacterial brown spot.

Cultural Control

Plant certified seed of recommended varieties less susceptible to bacterial brown spot. Avoid overhead irrigation and reuse of irrigation water where possible. Avoid working in fields when plants are wet. Promptly and thoroughly incorporate infested bean debris into the soil after harvest, and rotate beans with non-host crops such as small grains for at least two years. Practice strict sanitation of weeds and volunteer beans the following season.

Chemical Control

Antibiotic seed treatment and preventative bactericide applications can reduce spread of the brown spot pathogen, but chemical controls are most effective when integrated with sound cultural practices.

Product List for Bacterial Brown Spot:

Pesticide	Rate per Acre	Application Frequency	Remarks
Copper fungicides: not all formulations listed			
Basicop	32-64 oz	7-10	-
Champ DP	0.66-2.0 lb	7-14 days	Apply preventatively beginning when plants are 6" in height
Copper Count N#	64-96 fl oz	5-10	-
Cuprofix Disperss	1.5-3.5 lb	7-14 days	Apply preventatively beginning when plants are 6" in height
Kocide 2000	0.75-2.25 lb	7-14 days	Apply preventatively beginning when plants are 6" in height
Kocide 3000	0.5-1.25 lb	7-14 days	Apply preventatively beginning when plants are 6" in height
Nu Cop 50 WP	1-3 lb	7-14 days	Apply preventatively beginning when plants are 6" in height
Top Cop+S	64 fl oz (37.1)	-	1 day PHI
Tri Basic Copper#	32-48 fl oz	7-10	Maximum of 6 times
Streptomycin: not all formulations listed			
Agri-Strep 500	13 oz (6.6)	-	Slurry seed treatment (50,000 ppm)

The information herein is supplied with the understanding that no discrimination is intended and that listing of commercial products, necessary to this guide, implies no endorsement by the authors or the Extension Services of Nebraska, Colorado, Wyoming or Montana. Criticism of products or equipment not listed is neither implied nor intended. Due to constantly changing labels, laws and regulations, the Extension Services can assume no liability for the suggested use of chemicals contained herein. Pesticides must be applied legally complying with all label directions and precautions on the pesticide container and any supplemental labeling and rules of state and federal pesticide regulatory agencies. State rules and regulations and special pesticide use allowances may vary from state to state: contact your State Department of Agriculture for the rules, regulations and allowances applicable in your state and locality.

Categories: Dry Bean, Disease, Bacterial Brown Spot

Date: 04/01/2007