

Dry Bean

White Mold

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Identification and Life Cycle

White mold is caused by the fungus *Sclerotinia sclerotiorum* and can be one of the most devastating diseases of dry bean when conditions favor the pathogen. White mold development is influenced by prevailing weather conditions and certain cultural practices. High plant populations, narrow row widths, vigorously vining varieties, excess fertilizer, and abundant irrigation or rainfall all favor the development of white mold. High humidity and a wet plant canopy and/or soil surface are necessary for the fungus to spread. The disease may cause serious yield losses during wet, cool periods near the end of the growing season and even when the beans are in the windrow. Repeated cropping of susceptible crops, especially sunflower, increases the level of sclerotial contamination within a field. Irrigation runoff water transports sclerotia and spores within and between fields. White mold infection is often localized initially within the low-lying and more poorly drained areas of a field. Sclerotia can contaminate seed and introduce the pathogen into new fields. The pathogen survives between dry bean crops as a pathogen of numerous weeds and other crops, (i.e., sunflower, soybean, carrot, potato), in infected seed, and in the soil as sclerotia.

Plant Response and Damage

White mold initially appears on plants after flowering as water-soaked spots on infected leaves, stems, branches, and pods. These areas enlarge into a watery rotten mass of tissue that becomes covered by a white fungal growth. Stem infection causes the part of the plant above the point of infection to wilt and die. Affected stems appear bleached and dry which differs from the tan color characteristic of mature, dry plant tissue. Hard, black, irregularly-shaped resting structures (sclerotia) of the fungus form on and within the infected plant parts. Sclerotia which fall to the soil during harvest, germinate under a moist, closed canopy the following season as small (1/4 inch) beige-colored mushroom-like structures which release ascospores that are spread to dead blossoms or leaves. These spores germinate on and utilize this dead tissue as an energy source prior to the fungus invading healthy tissue. Yield losses of 40 to 100% are possible when susceptible varieties are planted in fields with a history of white mold.

Management Approaches

Biological Control

The fungus *Coniothyrium minitans* has been developed into a commercial formulations (Contans WG/ Intercept WG). Applications to the soil the fall before planting can reduce sclerotial populations. Spring applications generally are less effective.

Cultural Control

No single management strategy can completely control white mold, but the disease can be managed effectively by combining several cultural practices. Rotate for at least three years to non-host crops such as sugarbeets, corn, alfalfa, sorghum, and small grains to reduce the number of white mold sclerotia. Avoid planting in fields with a history of white mold for at least 3 years. If you must plant, use certified seed of recommended varieties of bush or upright vine types. Use recommended plant populations and row widths to promote rapid drying of the plants and soil surface between irrigations after flowering. Soil test and apply only the recommended amount of fertilizer to avoid excess canopy development. Schedule irrigations so that soil moisture is optimal before bloom, then irrigate as required by the crop for satisfactory growth since disease development depends on a moist soil surface beneath the plant. The only way to slow down a white mold epidemic late in the season is to extend irrigation intervals or cease irrigating without stressing seed fill.

Chemical Control

Chemical controls are most effective when combined with sound cultural practices. Apply recommended fungicide sprays to the crop during 100% to full bloom as a protection against infection. The degree of protection depends on good coverage of blossoms that have fallen to the soil surface and in the plant canopy.

Product List for White Mold:

| Pesticide | Product per Acre | Application Frequency (days) | Remarks |
|---------------------------------|-------------------------|-------------------------------------|--|
| Boscalid | | | |
| Endura | 8-11 oz | 7-10 days | Max of 2 applications per season; 21 day PHI |
| Cyprodinil / Fludioxonil | | | |
| Switch | 11-14 oz | 7 days | Max of 56 oz/A, 7 day PHI |
| Thiophanate Methyl | | | |
| Topsin M WSB | 1-2 lb | 4-7 days | Max of 2 applications; 14 day PHI (28 |

day PHI for lima bean)

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