UNIVERSITY OF ILLINOIS EXTENSION
College of Agricultural, Consumer and Environmental Sciences

report on **PLANT DISEASE**

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DEPARTMENT OF CROP SCIENCES
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BEAN WHITE MOLD

White mold, caused by the fungus *Sclerotinia sclerotiorum*, is one of the most important diseases of beans in Illinois, as well as worldwide. The pathogen affects all aerial parts of beans in the field and green beans in transit and storage. Bean crop losses by white mold may reach 100%. The disease is more serious in dense canopy, and in seasons when moist conditions occur during and after flowering.

Symptoms

Infected flowers usually develop a white, cottony appearance as mycelium grows on the surface. Lesions on pods, leaves, branches, and stems are initially small, circular, and dark green, and water-soaked but rapidly increase in size, become slimy, and may eventually encompass and kill the entire organ (Figure 1). Under moist conditions, the lesions may also develop a white, cottony growth of mycelium (Figure 2). Affected tissues dry out and bleach to a pale brown or white that contrasts with the normal light tan color of senescent tissue. Knots of white mycelium develop into hard, black sclerotia in and on infected tissue. Entire branches or plants may be killed.

Figure 1. White mold on bean pods, caused by Sclerotinia sclerotiorum. (Courtesy *APS, J. R. Stavely, from the files of W. J. Zaumeyer*).

Disease Cycle

Sclerotia may survive in soil for 5 years or longer. Under suitable conditions of temperature, light, and moisture, sclerotia within 5 cm of the soil surface germinate to produce apothecia (sexual reproductive structures) (Figure 3). Apothecia produce ascospores, which germinate and colonize flowers that are senescing. Flowers parts often fall onto pods, leaves, branches, and stems and provide the nutrients required by the fungus to penetrate these organs. Infected tissues are rapidly killed and become dry and bleached. Sclerotia form in or on the infected tissue and may fall to the soil, remain in crop debris, or be removed with harvested pods or seeds. The

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fungus may continue to develop and cause disease in green beans in transit and in storage.

Sclerotia produce apothecia in moist and cool [39°F (4°C)] conditions. Apothecia may be produced in 10-14 days at soil moisture levels near field capacity and soil temperatures of [59-64°F (15-18°C)]. Apothecia generally do not develop or persist until a dense crop canopy has formed to provide a moist microclimate. Dissemination of the pathogen occurs mainly by ascospores.

Irrigation water can spread mycelium, ascospores, and sclerotia. *S. sclerotiorum* has a wide host range, which leads to widespread contamination of fields through infection of crops and weed plants and production of sclerotia.

Bean plants become infected after flowering has started. Senescent petals may be colonized while attached or detached. Ascospores can survive on plant surfaces for up to 2 weeks, and mycelium in infected blossoms may remain viable for a month. Plant surfaces in contact with blossoms must remain continuously wet for 48-72 hours for infection to occur.

Figure 2. Sclerotia of Sclerotinia sclerotiorum on bean pods. (Courtesy *APS, H. F. Schwartz*).

Disease Management

- Avoid field with history of white mold.
- Crop rotation with nonhost crops (i.e., cereals) for ≥ 6 years.
- Control weeds effectively.
- Keep soil and plants as dry as possible.
- Maintain low plant canopy density.
- Avoid excessive amounts of nitrogenous fertilizers.
- Timely harvest crops and cool healthy pods at 45-50°F (7-10°C).
- Tilt soil immediate after harvest to breakdown tissues to prevent inoculum buildup.

Figure 3. Sclerotia and apothecia of Sclerotinia sclerotiorum. (Courtesy *APS, R. Hall, from the files of G. J. Boland*).

- White mold can be managed by fungicide applications. For up-to-date information on using fungicides for control of bean white mold, refer to the “Midwest Vegetable Production Guide for Commercial Growers.”