
BEAN WHITE MOLD CONTROL

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Abstract. The cause and control of white mold of bush beans and pole beans in the United States are reviewed.

Benomyl is the nationally used fungicide for the control of Sclerotinia sclerotiorum (Lib.) D. By.

Snap bean growing has been one of the most important phases of agriculture in the U.S., more than 3,000,000 tons being harvested annually (19). This acreage is distributed over most of 52 states and encompasses a diversity of soil types and weather conditions. Plantings are started in some states in the spring and continued until fall, while in other states plantings are started in late summer and continued until late spring. Under this type of production, conditions are optimal during most of the year for the outbreak of vegetable diseases of many kinds. One of the most serious is white mold caused by the fungus Sclerotinia sclerotiorum (Lib.) D. By. White mold has caused heavy losses in some of the most productive snap bean areas in the U.S. in recent years (3, 6, 12). Continued outbreaks of white mold plus the absence of adequate control measures (20, 21) have made snap bean production a hazardous enterprise in these areas.

Present farming practices such as continuous culture on the same tract of land, heavy seeding rates, fertilizer programs which promote luxuriant vine growth and packing hampers for shipment in the field without grading, have undoubtedly contributed to the white mold problem. Continuous bean culture favors the fungus by allowing the development of increasing populations in the soil with each succeeding planting. High density popu-
ment rates when the initial applications was made prior to first blossom with temperatures above 80°F but this had no effect on yield or quality. Pentachloronitrobenzene (PCNB) followed by ziram was the only fungicidal control for white mold in the Pacific Northwest (11) prior to the registration of Botran. Ziram plus sulfur was widely used in North Florida but not very effective in south Florida. The south Florida growers applied cyanamid and followed by foliar applications of Botran. Botran was applied by aircraft on pole beans at 7-day intervals. Under low disease pressure this program was adequate, but under severe pressure tons of beans were dumped and fields abandoned.

Post-harvest studies by Pegg 1962 (17) and McMillan 1969 (12) showed that a dip of Botran at a rate of 2 pounds per 100 gallons of water afforded excellent control of “nesting.” Botran not only prevented nesting but also eradicated the fungus from the hamper.

Probably the most significant breakthrough in vegetable disease control came in the late 1960’s, with the introduction of the benzimidazoles, systemic fungicides (10, 13). Thiabendazole (2-(4-thiazolyl)-benzimidazole) (TBZ) was first available for field testing for white mold in 1966 (5). Benomyl (methyl 1-(butylcarbamoyl)-2-benzimidazole carbamate) (DuPont 1961, Benlate) and Bay 33172 (2-(2-furyl)benzimidazole) were available in 1967 (5, 15). Gabrielson et. al. (5) compared Botran with TBZ and Benlate and reported that TBZ and Botran effectively controlled Sclerotinia on beans. It was Natti’s 1967 field test in New York that showed the effectiveness of Benlate. He found that Benlate at rates of 0.75 lbs and 1.5 lbs active per acre provided outstanding control of white mold under a wide range of environmental conditions. Natti (15) also reported that Benlate provided effective control for at least 22 days after the last spray application. The retention of a fungicide’s effectiveness on or in the plant not only minimizes the number of spray applications needed but also eliminates some of the concern for proper timing of sprays for effective control.

McMillan (7, 8, 9) investigated the effects of benomyl and TBZ for white mold control on pole beans and bush beans in south Florida. Under extreme disease pressure benomyl applied at 1 lb per acre in the seed-row and as ground or aerial sprays of 1½ lbs per acre at ½ bloom and full bloom provided outstanding control of white mold. At present the bean growers of the world, where white mold has been a persistent cause for losses into the millions of dollars, can feel with some degree of confidence that their white mold problem can be controlled.

A decade and half ago, prospects for an effective fungicide to control white mold were very poor. Development of systemic fungicides have changed this dismal outlook, and losses will probably be minimal in the future if correct procedures are followed.

Literature Cited