Influence of Application Timing of the Fungicide Headline on the Control Of Bean Anthracnose

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Bean anthracnose, caused by Colletotrichum lindemuthianum, has become a serious problem on the eastern prairies in western Canada. This disease attacks all the aboveground parts of the bean plant. Anthracnose forms elongate, dark-brown lesions that run along the veins of the leaves and often result in premature defoliation. The pathogen causes the formation of round sunken lesions on the stems and pods. Early pod infection usually results in shriveling and discoloration of the seed. Anthracnose can severely reduce bean yield and seed quality.

The judicious use of foliar fungicides is an important component of an overall integrated strategy to minimize losses caused by anthracnose. A 2-year field study was carried out at sites near Morden and Winkler, Manitoba to determine the effect of the timing of foliar applications of the fungicide Headline (pyraclostrobin, BASF registration pending) on the control of bean anthracnose in the navy bean cultivar Navigator. Single applications of Headline 250 EC at a rate of 0.1 kg ai/ha were made at four different growth stages. These fungicidal applications were made at the 3-5 trifoliate leaf stage, the early flowering stage (20-50% bloom), the late flowering stage (100% bloom) and at ten days after the end of flowering. Two sequential treatments, involving applications at the early and late flowering stages or at the late flowering stage and ten days after flowering, were also evaluated. An unsprayed check treatment was also included in the study. Two to three weeks after the last spray application, the plots were rated for disease severity. Anthracnose severity was separately evaluated for the middle and top one third of the plants at ten locations in each plot. The percentage of pod infection also was determined at the same ten sites in each plot. Anthracnose severity on the middle and upper third of the canopy of each plot was summarized by averaging the ten disease severity estimates for each plot. Entire plots were harvested for a yield determination. The percentage of discolored seed was determined based on a sample of 100 seeds from each plot.

A single application of Headline at the 3-5 trifoliate leaf stage reduced disease development and yield losses, but did not always prevent pod infection late in the growing season resulting in substantial levels of seed discoloration. A single Headline application at the early flowering stage reduced disease severity and prevented serious reductions in seed yield or quality. The application of Headline at the late flowering stage usually provided good control of anthracnose on the leaves and stems, but occasionally pod infection was severe. A single application of Headline at 10 days after the end of flowering did not prevent a high level of disease on the leaves, stems and pods, which resulted in reduced seed yield and quality. Sequential applications of Headline at the early and late flowering stages resulted in the lowest disease severity on all parts of the plant and the highest yield. Applications of Headline at the late flowering stage and ten days after flowering provided better disease control than a single application at ten days after flowering, but its effect on disease severity and yield were only slightly better than a single application at the late flowering stage. This study demonstrated that Headline should be applied during the early stages of flowering to maximize the control of anthracnose and reduce yield and quality losses caused by this disease.