CANADA
Sprayer Guide .COM

FEATURE ARTICLE June 2010

AgTech studies Lance fungicide use on dry beans

Producers want answers in white mold battle

White mold is a common disease in dry bean production in Southern Alberta. The Alberta Pulse Growers Commission, along with other stakeholders and researchers, asked the AgTech Centre of Alberta Agriculture and Rural Development to provide information on spraying technologies to use when applying foliar fungicides for controlling Sclerotinia white mold in dry bean crops.

Several foliar fungicides have not produced strong results and the industry was interested in comparing different spraying technologies to find out if the efficacy of Lance fungicide in bean fields with typical white mold pressures could be enhanced with a specific type of spray quality, penetration and deposition.

Recommended application rate for Lance in dry beans is 560 to 770 g/ha at the 20 to 50 percent flowering stage with a second application recommended seven to 14 days later if the disease persists or weather conditions are favorable for disease development. Growers have questioned the effectiveness of the second application.

Several new spraying technologies developed the past few years offered promise for foliar fungicides. Venturi nozzles induce air into the spray droplet. Variable rate nozzles automatically adjust for spray pattern and droplet size. Others such as twin nozzles have multiple spray angles orientated towards the desired plant target. Manufacturers of these new spraying technologies claim to have improved spray droplet quality, penetration and deposition to its intended target.

Many growers and industry maintain that a fine spray for foliar fungicide applications is best. Now with this variable rate nozzle technology, a direct comparison can be made between a fine and coarse spray using the orange and blue caps, respectively.

Water rates used by growers in southern Alberta to apply foliar fungicides in dry beans ranged from 112 to 224 L/ha (10 and 20 gpa) in the past. Since white mold control was erratic and unsatisfactory in 2004 and 2005, many growers believed these water rates were too low, not providing the coverage and spray penetration needed and that much higher water rates be tested with foliar fungicides.

However, tests conducted by the AgTech Centre in 2005 and 2006 using a high water rate of 30 gpa (336 L/ha) showed no significant improvement in a fungicides efficacy. To reduce research costs and number of treatments for the 2008 and 2009 fungicide trials, water rates of 112 and 224 L/ha (10 and 20 gpa) were selected.

Results

In 2008 trials were conducted at three sites in Southern Alberta, Taber, Coaldale and Bow Island, using five different nozzle types and two water rates to apply Lance fungicide. A cool summer and below average temperatures at night delayed dry bean maturity and development of white mold. Average disease incidence in untreated checks ranged from 2.7 percent at the Taber site to 4.7 percent at Coaldale. Overall white mold incidence in treated plots was reduced to an average of

Continued...

1.7 percent after two applications of fungicide. Disease pressures were not high enough to clearly distinguish differences among nozzle types let alone water rates.

In 2008, plots treated with the VariTarget orange caps showed lowest levels of white mold incidence and severity. A radical approach with the Ultra-Lo-Drift nozzles and spraying parallel with the crop rows showed potential since those treatments never scored the highest disease incidence. It was decided this trial should be repeated one more season at more locations to see if last seasons trends hold and show that fine sprays or spraying parallel with the rows may indeed enhance foliar fungicide efficacy.

In 2009 four trial sites in Southern Alberta were selected in the Enchant, Vauxhall, Burdett and Bow Island areas. Cool and below average temperatures during June were not favourable, delaying and prolonging plant maturity. Due to the slow plant development during the flowering stage, it was difficult to know when to apply the first application of Lance. The project seemed destined for similar results to previous years' trials with very low levels of disease pressure. However, prior to the first spray applications, major rains occurred and growing conditions and crop maturity changed dramatically after these early July rains, with bean plants rapidly growing.

In early August more rainfall and high humidity conditions persisted. First signs of the disease were seen August 6 shortly after the second applications were completed. The disease came fast and hard as it was very easy to find white mold on the plant pods and branches by August 12.

White mold pressure was very high at three of the four test sites. White mold incidence average in the untreated checks was 24 percent in Enchant, 92 percent in Bow Island, 97 percent in Burdett and 99 percent in Vauxhall. With the disease pressures high Lance fungicide failed to hold the disease in check. In sprayed plots disease incidence was reduced to nine percent in Enchant, 66 percent in Burdett, 82 percent in Vauxhall and 89 percent in Bow Island. White mold disease levels were well above any previous replicated trials conducted with Lance fungicide since 2005 by the AgTech Centre.

Control question

Disease incidences at 66 to 89 percent, after two fungicide applications brings into question the effectiveness of the fungicide during seasons when conditions favor development of white mold. In addition, the products or nozzle type effectiveness during the second application when plants have matured and closed up between the rows has also been raised in this study. In the Burdett test site, plants did not completely close up the rows prior to the second application and the disease incidence was reduced from 97 to 66 percent. This was the lowest reduction in disease incidence compared to the Vauxhall and Bow Island test sites that had similar incidences of the disease in the untreated checks.

At three of four test sites, plots treated with VariTarget blue cap nozzles showed lowest levels of disease incidence and severity. Even in the Enchant site, although treatment differences were not statistically significant among the nozzle types, plots sprayed with VariTarget blue cap nozzles had lower levels of disease incidence and severity. At the other end of the spectrum, plots sprayed with Greenleaf's TurboDrop TwinFan had some of the higher levels of disease incidence and severity, which is contrary to some other studies in North America where these nozzles were effective in controlling Asian soybean rust. None of the nozzle types were able to enhance Lance fungicide efficacy to levels growers were accustomed to prior to 2004.

The 2009 study also showed a correlation between disease severity index and seed yield in two of the four test sites. Treatments with the VariTarget blue cap nozzles with the lowest disease severity index generally had higher seed yields. Seed yields were also higher in the sprayed plots than in the untreated check in all the test sites and was significantly different in two or the four test sites. Overall, water application rates of 112 and 224 L/ha did not significantly affect disease incidence, disease severity or seed yield at all four test sites.

The strength of the methodology used held up again this season as differences between the treatments and untreated checks was visually evident throughout the season and after the plants were assessed for white mold disease.

Article support provided by Agtech CENTRE

CANADA Sprayer Guide .COM

Meristem Information Resources Ltd.
12-3109 Palliser Drive SW
Calgary, Alberta, Canada T2V 4W5

Phone: 403.543.7420
Fax: 403.543.7419
www.meristem.com
info@meristem.com