

2010 Dry Bean Research at the Brandon Research Centre

Annual Report
Submitted October 2010

Debra McLaren and Robert Conner

The 2010 dry bean pathology research activities funded by MPGA were conducted as outlined in the new Pulse Science Cluster program. All field activities of these studies were successfully completed despite the excessive precipitation that created wet conditions during the 2010 field season. The laboratory work on pathogen identification is ongoing, but some preliminary results are available.

Identification of the pathogens associated with root rot of dry bean in Manitoba

Root rot is a major disease of common bean in Manitoba and can cause significant yield reductions due to poor plant stands and weakened root systems. In some cases, the whole primary root system can be destroyed. When bean production fields are used in short rotations, the root rot problem can be exacerbated. Resistant cultivars are not yet available and control of root rot is difficult. *Fusarium solani* and *Rhizoctonia solani* were the most prevalent causal agents of dry bean root rot identified in previous Manitoba disease surveys. However, other *Fusarium* species such as *F. acuminatum*, *F. redolens* and *F. graminearum* have the potential to infect common bean cultivars as demonstrated in recent studies. These findings suggest that changes in the pathogen population may be occurring over time and stress the need to acquire new information on root rot pathogens in Manitoba bean crops in order to design effective control measures and to screen for host resistance.

In 2010, year 2 of a 4-year study funded by MPGA was initiated to survey crops of field bean at 40 different locations in southern Manitoba where most field beans are grown. The survey for root diseases was conducted in mid-July when most plants were at the late vegetative to early flowering stages. At three random sites from each of 40 commercial bean fields, 10 plants were collected and rated for severity of root rot. Root diseases were rated on a scale of 0 (no disease) to 9 (death of plant). Isolations were made from the roots of fifteen diseased plants from each field and the fungal colonies were examined for pathogen identification in the laboratory. *Fusarium* spp. were more frequently isolated from diseased roots than were *Rhizoctonia* spp. Identification of *Fusarium* spp. and *Rhizoctonia* spp. isolated from the root rot lesions is ongoing, as is the development of rapid methods for detection of prevalent *Fusarium* species. Pathogenicity tests of the predominant isolates of *Fusarium* will be conducted using a susceptible bean cultivar during the winter/spring of 2010-2011.

This 4-year study will identify the predominant pathogens associated with root rot of field bean in Manitoba. Bean breeders and pathologists will use this information to develop cultivars with

improved resistance to root rot. Dry bean cultivars with better root rot resistance will result in reduced yield losses and ultimately improve the profitability of bean production in Manitoba.

Acknowledgements

The funding provided by MPGA for these studies is greatly appreciated. Technical support provided by D. Hausermann, T. Kerley, T. Henderson, W. Penner, and D. Stoesz is gratefully acknowledged.