

2011 Field Pea and Dry Bean Research at the Brandon Research Centre

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The 2011 dry bean and field pea disease survey activities funded by MPGA were conducted as outlined in the Pulse Science Cluster program. All field activities of these studies were completed despite the excessively wet conditions that occurred during May and June of this field season. The 2011 laboratory work on pathogen identification is ongoing, but some preliminary results are available.

Root rot pathogens of dry bean in Manitoba

In Manitoba, root rot is a major disease of dry bean and can cause significant yield reductions due to weakened root systems and poor plant stands. In some cases, the whole primary root system can be destroyed. The root rot problem can be exacerbated when bean production fields are used in short rotations. 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 past Manitoba disease surveys. However, other *Fusarium* species such as *F. acuminatum*, *F. redolens* and *F. graminearum* have the potential to infect dry bean cultivars as demonstrated in recent studies. Changes in the pathogen population may be occurring over time and these findings stress the need to acquire new information on root rot pathogens in Manitoba bean crops in order to screen for host resistance and design effective control measures.

In 2011, year 3 of a 4-year study funded by MPGA was initiated to survey crops of dry bean at 33 different locations in southern Manitoba where most dry beans are grown. The survey for root diseases was conducted during mid- to late July when most plants were at the early bloom stage. Protocols for plant collection, root rot rating and isolations were the same as for field pea. In 2010 and 2011, root rot was observed in every field and average disease severities were similar. As with pea roots, *Fusarium* spp. were more frequently isolated from diseased bean roots than were *Rhizoctonia* spp. During the winter/spring of 2011-2012, pathogenicity tests of the predominant isolates of *Fusarium* will be conducted using a susceptible bean cultivar.

With both dry bean and field pea, an in-depth study of root rot pathogens is being conducted in association with the use of molecular biology techniques. To date, eight primers have been developed for detection of the root rot pathogens associated with these crops. Development of primers and PCR-based assays for rapid detection and differentiation of the pathogens will provide fast, sensitive and specific tests for application in the diagnosis of root rot pathogens of field pea and dry bean. This information can then be used by plant pathologists and pulse breeders to develop cultivars with improved resistance to root rot. Field pea and dry bean cultivars with

better root rot resistance will result in reduced yield losses and ultimately improve the profitability of pulse production in Manitoba.

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