

2010 Dry Bean Breeding Research at the Morden Research Station

Annual Report
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The 2010 dry bean breeding research activities at AAFC-Morden were conducted according to the project objectives as outlined in the newly initiated Pulse Science Cluster program. With funding from MPGA, our research focused on activities that will eventually benefit the local bean growers and industry. Despite the excessive wet conditions during the 2010 growing season, seeding and harvest were completed on time. The trial data are being analyzed and the final reports will be submitted and published in journals and on websites that include *Seed Manitoba* and *Pulse Beat*.

Two New Cultivars Registered

In collaboration with the AAFC research centres at Lethbridge and Harrow, we registered two new cultivars in 2010: the CBB-resistant navy bean 'Portage' (breeding line 056C-96204/H96204) and black bean 'Carman Black' (breeding line BK05-009). Both cultivars are well adapted to the Red River Valley of Manitoba, and have been tested in MPGA's Variety Screening Trials in 2009 and 2010. Portage and Carman Black will be marketed by Canterra Seeds Ltd.

MPGA Variety Screening Trials

The 2010 variety trials focused on a few market classes that included navy, black, pinto, kidney and cranberry bean. A total of 55 entries were tested under long growing season conditions at four locations (Morden, Carman, Winkler and Portage la Prairie). The 55 entries included 17 navy, 12 pinto, 8 black, 11 kidney, 5 cranberry, and 1 yellow bean cultivars. In addition, 18 entries were tested in MPGA's Short Season Narrow Row Regional Trials at Thornhill. Data from these trials will be published in *Seed Manitoba* and *Pulse Beat*, and will also be placed on MPGA's website, www.manitobapulse.ca.

Manitoba Cooperative Registration Trials

Forty five entries along with eight check cultivars were tested in the Long Season Wide Row (LSWR) trials, and two entries along with two check cultivars were evaluated in the Long Season Narrow Row (LSNR) trials. The trials were conducted at four locations (Morden, Carman, Winkler, and Portage la Prairie). These entries were provided by nine breeders / companies / institutions. The breeding lines and check cultivars in the LSWR and LSNR trials were evaluated for seedling resistance to anthracnose races 73 and 105 in growth chambers. These lines were also screened for resistance to white mould in an irrigated disease nursery at Winkler. The comprehensive evaluation of all these entries will be reported to support cultivar registration in Canada at the annual meeting of the Prairie Recommending Committee for Pulse and Special Crops (PRCPSC) of the Prairie Grain Development Committee (PGDC) in February 2011.

Development of Peruano Yellow Bean and Slow-Darkening Pinto Bean

Yellow and slow-darkening pinto are two new bean types for the export market. With previous funding support from MPGA, advanced populations were generated. In 2010, single rows of the advanced yellow bean and slow-darkening pinto lines were evaluated and selections will be entered in to the preliminary yield trials in 2011 at Morden and Carman. Additional crosses involving yellow bean and slow-darkening pinto as parents were made, and early generations were advanced.

White Mould Resistance Screening

The breeding lines and check cultivars in the Manitoba LSWR and LSNR Cooperative Registration Trials were evaluated for white mould resistance in the irrigated field disease nursery at Winkler. The nursery was inoculated with sclerotia of *Sclerotinia sclerotiorum* at the time of seeding. The white mould severity and incidence were determined. White mould incidence and severity were quite uniform throughout the each trial. The results will be reported at the annual meeting of the PRCPSC of PGDC in February 2010.

Common Bacterial Blight Resistance Breeding

CBB remains one of the most severe dry bean diseases in Manitoba. Joint efforts among the AAFC researchers led to the releases of two navy bean lines in 2009 with improved resistance to CBB (H96204/Portage, and H96048). Transfer of CBB resistance into Manitoba-adapted dry bean lines has been a continuous effort in the last several years. Advance populations were evaluated in the 2010 CBB nurseries at Morden and Harrow. Assisted with molecular marker technology, individual lines of navy, pinto and black beans were identified with improved resistance to CBB and were used in crossing advanced for future cultivar development.

Evaluation of Dry Bean Germplasm for Adaptation to Manitoba

One hundred and fifty black bean accessions that were introduced from the USDA bean germplasm collection and evaluated at Morden in 2009 were evaluated for the second year in 2010. Field notes were taken on plant maturity, resistance to CBB and white mould, growth habit, seed germination ability, seed quality, and yield potential. Artificial inoculation for resistance to anthracnose races 73 and 105 was repeated in growth chambers and will be reported at the 2010 Canadian Pulse Research Workshop in Calgary, AB. Performance of the collections in 2009 and 2010 will be compared and analyzed, and selections will be made. Elite lines will be tested in 2011 in replicated trails and used in crossing for cultivar development.

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