

Evaluation of Soybean Collections at the Morden Research Station

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To evaluate worldwide soybean germplasm for use in public breeding in Manitoba, 155 soybean lines were introduced from the USDA Soybean Germplasm Collection. These lines were originated from many countries but mainly from China, Japan, and Russia, with maturity groups (MG) classified as MG 000 to MG 00. In the preliminary evaluation conducted in 2009, variation was observed in plant growth type, plant height, pubescence colour, maturity, seed size, hilum colour and yield potential. In 2010, these lines were grown again at the Morden Research Station. Check cultivars were used for comparison which included Trail (MG0.0), Maple Ridge (MG00.3), Glacier (MG00.8), Jim (MG00.8) and Maple Presto (MG000.9) (Kindly provided by Dr. Elroy Cober, Soybean Breeder, AAFC-ECORC).

The soybean lines were planted in three replications with 100 seeds per plot of a single row of 5 m long and 0.6 m in spacing. The field observation was taken on flower color, flowering and maturing dates, disease resistance, lodging resistance, growth habit, shattering resistance, seed size and hilum colour, pubescence and pod colour, and yield potential.

Overall, the collections performed really well in 2010. Majority of the lines appeared very adapted to the Manitoba growing conditions. The flowering date varied significantly: from July 15 to July 30. Both determinate and indeterminate growth types were observed. Disease and shattering were not major concerns. There was no symptoms of leaf chlorosis (mineral deficiency) observed in the field. The lodging resistance was evaluated with a scale of 1 (no lodging) to 5 (severer lodging) and the ratings ranged from 2 to 4.5. The maturity varied significantly among different accessions: from September 25 to October 15. Most of the lines matured earlier than the check cultivar Trail (MG0.0, October 4). There were 16 lines matured later than Trail, which may be classified into MG 1.

The seed coat colour was predominantly yellow. However, five lines had black seed coat, 19 lines had green seed coat and 11 lines had brown seed coat colour. Various seed hilum colour was observed which ranged from transparent (yellow) to black. The 1000-seed weight ranged from 82 to 355 gram. Lines were identified which can be used as breeding materials for large-seeded tofu bean or small-seeded natto bean types. The seed yield varied significantly, ranging from 230 to 2617 LB/Ac. Elite lines were selected and sufficient seed was produced for replicated tests in 2011. The germplasm with high yield potential, good seed quality and suitable adaptation to Manitoba will be used in crossing for cultivar development.