

Pulse crop breeding update

T.D. Warkentin, A. Vandenberg, B. Tar'an, and K.E. Bett

Crop Development Centre/Department of Plant Sciences, University of Saskatchewan,
Saskatoon, SK S7N 5A8

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Abstract

The pulse crop breeders at the Crop Development Centre (CDC)/Department of Plant Sciences are developing improved cultivars of lentil, field pea, chickpea, dry bean and fababean for producers in western Canada. General objectives include improvement of yield, disease resistance, earliness, and quality for diverse markets.

The following section summarizes the objectives of the individual pulse crop breeding programs and recent variety releases. The pulse crop breeders at the CDC are involved in numerous research projects which supplement variety development. These are summarized in the CDC annual report.

Lentil

The overall objective is the genetic improvement of lentil resulting in high yielding cultivars with resistance to major foliar diseases, acceptable quality profiles for export and domestic food markets, and improved agronomic traits. Sub-objectives are green lentil breeding, red lentil breeding, and specialty lentil breeding.

Recent variety releases. Small red lentil line (2702-10, now **CDC Cherie**) was registered with the VRO and seed was multiplied for potential release in 2012.

Spanish brown lentil line (3020-6, now **CDC SB-1**) was registered with the VRO in 2010. It was released previously to Simpson Seeds Inc. and successfully entered the commercialization and export stream in 2010-2011.

Small red lentil (IBC-289, now **CDC Dazil**) with imidazolinone tolerance was recommended for registration in February 2010, released to Select seed growers in 2010, and registered with the VRO.

Chickpea

The objective is the development of high yielding, early maturing kabuli and desi chickpea cultivars with resistance to ascochyta blight and acceptable quality for each market class.

Recent variety releases. A large seeded kabuli variety named as **CDC Orion** (tested as 491-5), was jointly released in 2010 by CDC and Crop Diversification Centre South at Brooks. This variety has high yield potential especially in the Brown soil zone, which was about 10% higher than the yield in the Dark Brown soil zone. CDC Orion also has fair resistance to ascochyta blight, acceptable maturity and good canning quality. In 2010 and 2011 there was 950 kg breeder seed of CDC Orion sold to select growers in both SK and AB.

CP71, named as **CDC Alma**, was also released in 2010. CDC Alma is a medium-large seeded kabuli similar to CDC Luna and slightly larger than CDC Frontier. CDC Alma has high yield potential on both Brown and Dark Brown soil zones. The Variety Release Program of the Saskatchewan Pulse Growers sold a total of 1,450 kg breeder seed in 2010 to select seed growers in western Canada.

One desi variety, **CDC Cory** (tested as CP55), was released to select seed growers in 2010. CDC Cory has high yield potential on both Brown and Dark Brown soils. It has fair resistance to ascochyta blight. The average seed weight of CDC Cory is 250 g / 1000 seeds. It has angular to plump seed shape with tan seed coat colour at harvest. It has a slightly spreading growth habit. A total of 500 kg breeder seed was sold to select seed growers.

One kabuli variety (**493-24**) was released to select seed growers in 2011. 493-24 is a high yielding medium-large seeded (8-9 mm) kabuli variety larger than CDC Frontier and CDC Luna with fair resistance to ascochyta blight and earlier maturing than CDC Frontier. 493-24 has a good adaptation on both Brown and Dark Brown soil zones. A total of 1,200 kg breeder seed was sold to select growers in 2011.

Faba bean

The objective is genetic improvement of faba bean for yield, adaptation, early maturity, lodging tolerance and culinary, physical and nutritional quality traits of non-traditional small-seeded white flowered faba beans and large-seeded food type faba beans for global markets. Through international collaborative efforts we will develop partnerships focused on market development potential and incorporation of genotyping based selection methods in breeding in parallel with efforts underway for the other pulse crops.

The first small-seed, white-flowered faba bean from this program, **FB34-2**, received recommendation in 2011. It will be marketed via SPG.

Dry bean

The overall objective is the genetic improvement of adaptation, yield, seed coat characteristics, seed shape, agronomic characters such as pod clearance, cold tolerance and resistance to specific diseases such as seed borne bacterial blights, white mold and anthracnose. Subobjectives are standard market classes such as pinto, great northern, red, black and navy; specialty market classes such as peruano (yellow), flor de mayo, flor de junio, pink and carioca.

Recent variety releases. Continued successful developments in commercialization of **CDC WM-2**. It is on track to replace CDC WM-1 as the only slow-darkening pinto in Canada.

Registration of the first yellow bean variety developed for western Canada, **CDC Sol**. Seed production continued in collaboration with industry partners.

Seed production of the first CBB tolerant black bean (name TBD) is proceeding in Manitoba where it is generally better adapted.

Field pea

The overall objective is the development of early maturing, high yielding field pea cultivars with resistance to powdery mildew and improved resistance to mycosphaerella blight and lodging with superior quality for export and domestic markets. Subobjectives are food pea breeding and specialty pea breeding.

Recent variety releases. Yellow cotyledon variety **CDC Hornet** (CDC 1749-8) was released by Saskatchewan Pulse Growers in spring 2010. CDC Hornet has powdery mildew resistance, good lodging resistance, early maturity, medium seed size and good yield potential.

Green cotyledon variety **CDC Pluto** (CDC 1996-216) was released by Saskatchewan Pulse Growers in 2010. CDC Pluto has small seed size and good resistance to cotyledon bleaching suited to canning markets, powdery mildew resistance, good lodging resistance, medium maturity, and good yield potential.

Green cotyledon variety **CDC Tetris** (CDC 1812-5) was released by Saskatchewan Pulse Growers in 2010. CDC 1812-5 has medium seed size with blocky shape suited to Asian snack food markets, powdery mildew resistance, good lodging resistance, medium maturity, and good yield potential.

Yellow cotyledon variety **CDC 2093-22** was released by Saskatchewan Pulse Growers in spring 2011. CDC 2093-22 has powdery mildew resistance, good lodging resistance, medium maturity, medium-large seed size, smooth, round seeds with low seed coat breakage score and good yield potential.

Green cotyledon variety **CDC 2235-4** was released by Saskatchewan Pulse Growers in 2011. CDC 2235-4 has medium seed size with round shape and low seed coat breakage score and good bleaching resistance, powdery mildew resistance, good lodging resistance, medium maturity, and good yield potential.

Yellow cotyledon forage variety **CDC Horizon** (CDC 1681-11) was released by Saskatchewan Pulse Growers in 2010. CDC Horizon has semi-leafless leaf type, white flowers, powdery mildew resistance, good lodging resistance, medium maturity, small seed size, good grain yield potential and good biomass productivity. Forage peas are used in dairy, beef and sheep rations, typically grown in mixtures with forage barley.

Maple pea variety **CDC Mosaic** (CDC 1816-4) was released by Saskatchewan Pulse Growers in 2010. CDC Mosaic has improved yield and improved lodging resistance compared to previously released maple pea varieties CDC Acer and CDC Rocket. Maple peas are used in seed mixes for domestic birds, such as racing pigeons.

Dun pea variety **CDC Dakota** (CDC 2098-20) was released by Saskatchewan Pulse Growers in 2010. CDC Dakota has improved yield and lodging resistance compared to the previously released dun pea variety CDC Dundurn. Dun peas are typically dehulled and then used in human consumption markets in India.

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