

## Registration of 'Beluga' Alubia Bean

'Beluga' alubia bean (*Phaseolus vulgaris* L.) (Reg. no. CV-158, PI 604229) was developed and released cooperatively by the Michigan Agricultural Experiment Station and the USDA-ARS in 1998 as an upright, full season, disease-resistant cultivar.

Beluga, tested as K90902, was derived from a cross made in 1988 between the Italian Borlotto bean 'BEA' with the white kidney bean 'Lassen', BEA/Lassen. BEA was supplied by Matt Silbernagel (USDA-ARS, Prosser, WA) and Lassen is a determinate, early-season commercial cultivar. The objective of the cross was to develop an adapted, large-seeded white bean equivalent in appearance and performance to U.S. white kidney bean cultivars and the Argentinian Alubia bean that is preferred in European markets. The  $F_1$  plants were advanced in the greenhouse and space-planted in an  $F_2$  nursery at the Montcalm Research Farm near Entrican, MI. A single-plant  $F_2$  selection was identified as possessing the desired agronomic and great northern seed traits. The  $F_3$  progeny were advanced as a plant row in Puerto Rico. A single-plant selection was made in a space-planted  $F_4$  nursery in Michigan on the basis of agronomic traits, seed traits, and resistance to bean anthracnose [caused by *Colletotrichum lindemuthianum* (Sacc. & Magnus) Lams.-Scrib.]. The  $F_5$  progeny were advanced as a plant row in Puerto Rico. The  $F_6$  breeding line, coded K90902, entered replicated yield trials in 1990.

Beluga was extensively tested for yield and agronomic traits at 24 locations in Michigan, over eight seasons (1990–1997). Beluga averaged 2430 kg ha<sup>-1</sup> and at over 20 locations outyielded 'Montcalm' dark red kidney by 5% and yielded 3% less than 'Chinook' light red kidney bean cultivars. Beluga is recommended for production in coarse textured soils under a high input management system and the variation in yield observed across locations reflects the fact that recommendation was not met at all test locations.

Beluga averaged 52 cm in height and exhibits a Type I determinate growth habit, with resistance to lodging. Beluga has white flowers and blooms 48 d after planting. Beluga is a full season bean, maturing 105 d after planting and with a range in maturity from 100 to 108 d, depending on season and location. Beluga matures 1 d later than Montcalm and 2 d later than Chinook.

Beluga carries the single dominant hypersensitive *I* gene for resistance to bean common mosaic virus (BCMV), but is sensitive to temperature-insensitive necrosis-inducing strains of bean common mosaic necrosis virus (BCMNV) such as NL 3 and NL 8, which induce the black root reaction. Beluga possesses the *Co-1* gene which conditions resistance to Races 65 and 73 of anthracnose, and is essentially immune to the indigenous races of rust [*Uromyces appendiculatus* (Pers.:Pers.) Unger] prevalent in Michigan. Beluga is susceptible to halo blight [*Pseudomonas syringae* pv. *phaseolicola* (Burkholder) Young et al.], common blight [*Xanthomonas campestris* pv. *phaseoli* (Smith) Dye], root rot [primarily *Fusarium solani* (Mart.) Sacc. f. sp. *phaseoli* (Burkholder) W.C. Snyder & H.N. Hans.], and white mold [*Sclerotinia sclerotiorum* (Lib.) de Bary].

Beluga has a large white kidney seed which averages 62 g 100 seed<sup>-1</sup> (range: 58–63 g 100 seed<sup>-1</sup>). The seed is similar in size to Montcalm and Lassen, and the dry seed has a desirable bright shiny color. In canning trials, Beluga was subjectively rated by a team of panelists as satisfactory in cooking quality. Beluga scored 3.0 on a five-point hedonic scale (where 5 is best). This evaluation is based on whole-bean integrity (no splitting or clumping), uniformity of size (uniform water uptake), color (no after darkening), and clear brine (no starch extruded into canning liquid). After it is processed, Beluga does not differ significantly from other commercial kidney bean cultivars for cooked texture, hydration, and drained weight ratios.

Beluga alubia bean has been released as an exclusive cultivar and a royalty will be assessed on each hundredweight unit of foundation seed sold. Variety protection will be applied for under the U.S. Plant Variety Protection Act, with the option that Beluga may be sold for seed by name only under the Certified class. Breeder seed is maintained by the Michigan Agricultural Experiment Station, East Lansing, MI 48824, in cooperation with the Michigan Crop Improvement Association.

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## References and Notes

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## Registration of 'Prolina' Soybean

'Prolina' soybean [*Glycine max* (L.) Merr.] (Reg. no. CV-393, PI 597389) was developed by the USDA-ARS, in cooperation with the North Carolina Agricultural Research Service. It was released in 1996 to provide a cultivar of Group VI maturity with increased seed protein concentration. Prolina is most adapted to production areas between 33° and 37° N latitude.

Prolina is the bulk of two  $F_4$ -derived lines selected from the first cycle of a recurrent selection population designated NRS4. The population originated from matings of 10 high-protein lines with the cultivars 'Bragg', 'Ransom', and 'Davis' (5,6,7,8). The high-protein parents (470–490 g kg<sup>-1</sup> protein) were  $F_3$  lines from Cycle 7 of Population IA in a recurrent selection program for increasing seed protein (4). Parents of Population IA were D55-4110 and N56-4071. 'Ogden' and 'CNS' were parents of D55-4110 (10,11). Maternal grandparents of N56-4071 were 'Volstate' and Ogden (10). The male parent of N56-4071 was a sister line of Lee.

In the initial population development, seven or eight matings of each parental combination resulted in 234  $F_1$  hybrids. These were selfed to produce 234  $S_1$  families. A restricted index was applied to this initial population of  $S_1$  families. The index was designed to increase average yield and maintain the average protein concentration at constant level (8). Modified pedigree selection was applied to  $S_1$  families chosen in the field index selection cycle. Prolina was initially tested as an  $F_6$  line in 1987 under the designation N87-984. Because of heterogeneity for plant height within the line,  $F_9$  lines were derived from N87-984 using single seed descent. These  $F_9$  lines were evaluated in multiple North Carolina locations in 1991. The two lines most desirable in terms of uniformity, protein concentration and seed yield were bulked in 1992. The N87-984 designation was maintained.

Prolina was tested in the Uniform Preliminary V1 nursery in 1993 (9) and in the North Carolina Official Variety Trials in 1992, 1993, and 1994 (1,2,3). In the Uniform Preliminary tests (7 locations), Prolina matured 5 d earlier in full-season planting than the check cultivar Centennial. Average seed protein concentration of Prolina was significantly greater than that of Centennial (461 vs. 428 g kg<sup>-1</sup>,  $P < 0.01$ ), and seed oil concentrations of the two were

200 and 198 g kg<sup>-1</sup>, respectively. Average yield of Prolina was 13% less than Centennial. In North Carolina variety trials (1992–1994), yields of Prolina were equal to those of Centennial. Prolina has yellow seeds with shiny luster, buff hila, purple flowers, gray pubescence, tan pod walls, and determinate growth habit.

In 1994, breeder seed was provided to North Carolina Foundation Seed, Inc. Seed was distributed to other states by request and according to seed supply. The North Carolina Agricultural Research Service will be responsible for maintaining breeder seed. Small samples (500 seeds) of Prolina can be obtained from the corresponding author for at least five years.

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## Registration of 'LS90-1920' Soybean

'LS90-1920' soybean [*Glycine max* (L.) Merr.] (Reg. no. CV-394, PI 604100) was developed by Southern Illinois University at Carbondale. It was released in 1996 because of its combination of resistance to soybean cyst nematode (SCN) (*Heterodera glycines* Ichinohe) Race 3 (7), and soybean sudden death syndrome (SDS) [*Fusarium solani* (Mart.) Sacc. f. sp. *glycines*]. LS90-1920 is a nonexclusive release for nonspecific brand labeling.

LS90-1920 originated as an individual F<sub>5</sub> plant selection from the cross 'Essex' × 'Fayette' (8,2). The F<sub>2</sub> and subsequent generations were advanced by single-pod descent(3). A single F<sub>5</sub> plant was selected on a field infested with SCN Race 3. Soybean cyst nematode resistance was determined in subsequent generations by greenhouse evaluation using SCN Race 3 infested soil collected from a field near Elkhart, IL. Resistance was confirmed at the University of Arkansas by greenhouse evaluation against a SCN Race 3 isolate maintained on Essex and at the University of Missouri by greenhouse evaluation against a SCN Race 3 isolate maintained on 'Hutcheson' (4). LS90-1920 also was tested in five *F. solani* infested environments in southern Illinois during 1993 to 1997. These trials were managed and scored as described earlier

(5). LS90-1920 exhibited a high level of resistance to SDS with a disease index score of 0.44 vs. 6.24 for 'Delsoy 4710' (1), a moderately resistant cultivar, and 31.8 for 'Spencer' (10), the susceptible check.

LS90-1920 was evaluated in the Regional SCN Tests (6) in 1994 and 1995 and the Uniform Soybean Tests—Southern Region (9) in 1993, 1994, and 1995. Seed yield of LS90-1920 was 2% higher than Delsoy 4710, the SCN resistant check.

LS90-1920 is classified as a Maturity Group IV cultivar and matures 3d later than Delsoy 4710 in a full season planting. Its range of adaptation is from approximately 35° to 39° N lat. It is determinate in growth habit, and has purple flowers, tawny pubescence, and tan pod walls. Plant height averages 84 cm, compared with 108 cm for Delsoy 4710. Lodging score averages 1.8, compared with 2.3 for Delsoy 4710. Seedcoats are shiny yellow with brown hila. Seed quality scores average 1.6 for LS90-1920, compared with 2.0 for Delsoy 4710. Seed size is approximately 133 mg seed<sup>-1</sup>, compared with 168 mg seed<sup>-1</sup> for Delsoy 4710. Seed composition averages 423 g kg<sup>-1</sup> protein and 207 g kg<sup>-1</sup> oil on a dry weight basis.

LS90-1920 is resistant to stem canker [caused by *Diaporthe phaseolorum* (Cook & Ellis) Sacc. var. *caulivora* K.L. Athow & R.M. Caldwell] and frogeye leafspot caused by *Cercospora soja* K. Hara.

LS90-1920 is released for nonexclusive licensing to seedmen for brand labeling. Seed maintenance and distribution will be handled by Gateway Seed Company, Van Buren Road, Nashville, IL. Breeder seed will be maintained by Southern Illinois University at Carbondale, Carbondale, IL 62901. Small quantities of seed for breeding and research purposes may be obtained from Southern Illinois University at Carbondale for a minimum of 5 years from the date of this publication by writing the corresponding author.

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