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 F1 plants were advanced in the greenhouse and space-planted in an F2 nursery at the Montcalt Research Farm near Entran, MI. A single-plant F2 selection was identified as possessing the desired agronomic and great northern seed traits. The F3 progeny were advanced as a plant row in Puerto Rico. A single-plant selection was made in a space-planted F2 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 F3 progeny were advanced as a plant row in Puerto Rico. The F4 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~1 and at over 20 locations outyielded ‘Montcalt’ 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 determinant 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 Montcalt and 2 d later than Chinook.

Beluga carries the single dominant hypersensitive (hypo) 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~1 (range: 58–63 g 100 seed~1). The seed is similar in size to Montcalt and Lassen, and the dry seed has a desirable bright shiny color. In caging 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 caming 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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Published in Crop Sci. 39:294 (1999).

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 F2-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~1 protein) were F1 lines from Cycle 7 of Population IA in a recurrent selection program for increasing seed protein (4). Parents of Population 1A were D55-4110 and N56-4071. ‘Ogden’ and ‘GNS’ 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 F2 hybrids. These were selfed to produce 234 S1 families. A restricted index was applied to this initial population of S1 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 S1 families chosen in the field index selection cycle. Prolina was initially tested as an F1 line in 1987 under the designation N87-984. Because of heterogeneity for plant height within the line, F2 lines were derived from N87-984 using single seed descent. These F2 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~1, P < 0.01), and seed oil concentrations of the two were