Registration of ‘Capri’ Cranberry Bean

‘Capri’ cranberry bean (Phaseolus vulgaris L.) (Reg. no. CV-262, PI 642027) was developed cooperatively by the Michigan Agricultural Experiment Station and the USDA-ARS and released in 2005 as an upright, midseason, disease-resistant cultivar.

Capri, tested as C99833, was developed from the cross ‘Cardinal’/K94803 made in 1996. Cardinal is a cranberry bean cultivar that was not commercialized because of an internal black spot problem known as “marsh spot” in the center of seed. The defect is a physiological disorder not unlike the phenomenon of “hollow heart” defect in vegetable crops caused by limitations in the translocation and accumulation of key minerals in the bean seed (Moraghan and Grafton, 1997, 2001; Wallace, 1943). The problem results in a discoloration of the interior of the cotyledon and renders the split seed unmarketable for specialty niche markets. K94803 was a large white kidney bean breeding line originating from the Michigan State University bean breeding program that did not exhibit the seed problem. The cross was made to correct the seed quality problem present in Cardinal.

F1 plants were advanced in the greenhouse, and F2 seed was space-planted in a nursery at the Montcalm Research Farm near Entrican, MI, in 1997. A single F2 plant possessing the desired agronomic and cranberry bean seed traits was selected. The F2:3 progeny row was planted at the University of Puerto Rico Research Station at Isabela and mass selected on the basis of agronomic and cranberry seed traits. In 1998, a single-plant selection for upright bush habit, lodging resistance, acceptable pod load and placement, uniform mid-season maturity, and commercial cranberry bean seed traits was made in a space-planted F4 nursery in Michigan. The F4:5 progeny row was advanced at Isabela, Puerto Rico, and the reaction to virus was confirmed by inoculating remnant seed in the greenhouse for resistance to the NL 3 strain of Bean common mosaic necrosis virus ( BCMNV).

The F4:6 breeding line, coded C99833, was tested for yield and agronomic traits at 18 locations in Michigan from 1999 to 2005 before release. Capri averaged 2800 kg ha⁻¹ over all locations and significantly outyielded ‘Taylor Horticultural’ by 15% over 16 locations. Because of limited testing (<10 locations), Capri was did not differ significantly in yield from the two commercial cranberry bean cultivars Hooter and Etna despite averaging 10% yield increase over both cultivars.

Capri exhibits an upright determinate Type I growth habit, with minimal lodging. It matures uniformly about 4 d later than Taylor Horticultural and Etna and 6 d earlier than Hooter.

Capri carries the dominant I gene for resistance to Bean common mosaic virus ( BCMV), but is sensitive to the temperature-insensitive necrosis-inducing strains of BCMV such as NL 3 and NL 9, Fusarium solani pv. phaseoli, and Uromyces appendiculatus de Bary. It is also susceptible to Michigan isolates of root rot [caused by Fusarium solani (Mart.) Sacc. f. sp. phaseoli W.C. Snyder & H.N. Hans.] and white mold [caused by Sclerotinia sclerotiorum (Lib.) de Bary].

Capri produces a highly desirable, large white cranberry seed that averages 60 g 100 seed⁻¹ compared to ‘Taylor Horticultural’ (52 g) and Hooter (56 g). The seed exhibits lower incidence (15%) of internal black spot compared to Cardinal (49%). It is similar to Hooter (14%) in higher incidence than Taylor Horticultural (9%). The seed appears worse in larger sized seeds within the cranberry class.

In canning trials, Capri scored 4.1 on a seven-point scale (where 7 is most desirable, 1 is least desirable, and 4 is average), whereas Taylor Horticultural and Hooter scored 3.6, respectively. Capri does not differ from other cranberry bean cultivars in seed hydration and weight ratios, but it produces a slightly firmer cooked bean. Canning quality is less important in the cranberry class because the major international market is based on the dry cranberry bean seed.

Capri cranberry bean cultivar was released by the Michigan Agricultural Experiment Station, East Lansing, MI, and is available under license from the MSU Office of Technology Transfer. Royalty will be assessed on each 100-weight unit of Foundation Seed sold. Breeder Seed is maintained by the Michigan Agricultural Experiment Station under license with the Michigan Crop Improvement Association. Small quantities of Breeder Seed for testing purposes can be obtained from the first author.

J.D. Kelly,* G.V. Varnier, G.L. Hosfield, G.A. Uebersax

References

