Registration of ‘Black Violet’ Common Bean

‘Black Violet’ (Reg. no. CV-213, PI 633616), a large-seeded, purple-podded, black common bean (Phaseolus vulgaris L.), was developed at the Agriculture and Agri-Food Canada (AAFC) Research Centre, Lethbridge, AB, in cooperation with the AAFC Research Station, Morden, MB, and released in 2003. Black Violet was tested in the narrow-row dry bean registration trials in Manitoba for 2 yr and registered in 2003 (Registration no. 5605, Variety Section, Plant Products Division, Canadian Food Inspection Agency). It is a high-yielding upright cultivar, with moderate resistance to white mold [caused by Sclerotinia sclerotiorum (Lib.) De Bary]. It is particularly adapted to narrow-row production high heat unit areas of southern Manitoba.

Black Violet, tested as L95F025, was derived from the cross UI906/WBR22-3. UI906 is an upright Type IIa (Schwartz et al., 1996), small-seeded opaque black bean from University of Idaho, registered in 1991. WBR22-3 is an erect Type II, opaque black bean germplasm line from the University of Wisconsin and EMBRAPA, Brazil, registered in 1989. It has the dominant I gene resistance to Bean common mosaic virus (BCMV, a potyvirus).

The F1 was grown in the greenhouse; the F2 and F3 were grown in the field at Lethbridge; and the F3 increased in the greenhouse during 1991-1992. In the F3 grown in the field at Lethbridge in 1993, some selection was practiced for plant type, maturity, and seed characteristics. This was followed by growing two more indoor generations, and selected F3 plant-to-progenies were sown in the field in 1994. After testing L95F025 in a modified augmented design (MADIa) in 1994, it was entered into multilocation yield tests.

A series of narrow-row (23 cm) and wide-row (60 cm) yield tests followed in 1995 and 1996 at Lethbridge and Vauxhall, AB. Because L95F025 did not mature earlier than the check, UI906, the subsequent tests were performed in southern Manitoba, a region of greater heat units during, in 1999 and 2000. This was followed in 2001 and 2002 by tests in the narrow-row part of the Manitoba Dry Bean Cooperative Registration test. The data generated in 2001 and 2002 trials formed the basis for seeking support and obtaining registration of Black Violet. Plants from 100 pods collected at Vauxhall in 1997 were grown in the greenhouse in 1998. Progeny-rows were increased at Santiago, Chile during 1998-1999. At Kimberly, ID, 24 progeny rows were grown in 1999 and at Yuma, AZ, in 2000. Finally, a bulk was grown on 0.2 ha at Othello, WA, in 2001 to produce Breeder seed.

When averaged over seven trials, Black Violet matured in 106 d and yielded 3240 kg ha⁻¹ compared with a corresponding 106 d and 3480 kg ha⁻¹ for ‘AC Harblack’, the highest-yielding black bean grown in Manitoba. Black Violet has the indeterminate growth habit Type IIa with erect stems and branches and no vines, while both check cultivars, AC Harblack and AC Black Diamond, are Type IIb, with medium length (30-50 cm) vines. Lodging (scored on a 1-to-5 scale, where 1 = upright and 5 = prostrate) at maturity, averaged over seven trials was 1.7 for Black Violet and 2.5 for AC Harblack. Dry seeds of Black Violet are opaque, while both AC Harblack and AC Black Diamond have black shiny seed coats. Seed coloring occurs earlier in Black Violet in the fall than in AC Harblack, thus reducing the risk of quality deterioration from early frosts.

The pods turn distinctively purple before maturity compared to green turning buckskin for AC Harblack. The 100 seed weight of Black Violet averaged 19.7 g over seven sites, which is greater than that of AC Harblack (17.7 g). The pods of Black Violet are broadly elliptic in cross-section through the seed, as for AC Black Diamond, in contrast to elliptic for AC Harblack.

Black Violet is moderately resistant to white mold (28% incidence) compared with AC Harblack (52% incidence). Black Violet is resistant to the strain 15 of BCMV, and variable for resistance to the strain 1, with a necrosis, followed by death of over half of the infected plants. Black Violet has similar resistance to the delta race of Colletotrichum lindenuthianum (Sacc. & Magnus) Lams.-Scrib. as AC Harblack and AC Black Diamond. Black Violet is moderately resistant to race 1096. However, Black Violet is highly susceptible to races α-Brazil and 73. Black Violet is susceptible to the yellow and orange strains of bacterial wilt [caused by Curtobacterium flaccumfaciens pv. flaccumfaciens (Hedges) Collins & Jones (Hsieh et al., 2003)].

Black Violet has been released on an exclusive basis through a licensing arrangement with the Agriculture-Unit, Bean Business Unit (2802-5th Avenue North, Lethbridge, AB, Canada T1H 0P1) from where pedigreed seed may be purchased. Small samples of seed of Black Violet may be obtained from the corresponding author for at least 5 years. Application for U.S. Plant Variety Protection is not expected.


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References


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