Registration of ‘Agrinto’ Pinto Bean

‘Agrinto’ (Reg. no. CV-265, PI 642402), a tall, partially upright pinto common bean (Phaseolus vulgaris L.), was developed at the Agriculture and Agri-Food Canada (AAFC) Research Centre, Lethbridge, AB, in collaboration with the AAFC Research Station, Morden, MB, and released in 2006. Agrinto was tested in the wide-row dry bean registration trials in Alberta and Saskatchewan, Canada, for 2 yr and registered in 2006 (Registration no. 6069, Variety Registration Office, Plant Production Division, Plant Products Directorate, Canadian Food Inspection Agency). It is resistant to both the yellow and orange strains of bacterial wilt [caused by Curtobacterium flaccumfaciens pv. flaccumfaciens (Hedges) Collins & Jones]; is resistant to race 73 of anthracnose [caused by Colletotrichum lindemuthianum (Sacc. & Magnus) Lam.-Scrib.]; and is moderately resistant to white mold [caused by Sclerotinia sclerotiorum (Lib.) de Bary]. Agrinto is well adapted to wide-row irrigated production of the Canadian prairies, with yields comparable to those of ‘Othello’.

Agrinto, tested as L02B662, was derived from a cross made in 1997, 980017 = L95B147/L97B203; both are elite Lethbridge-developed pinto lines, with L95B147 being an upright, tall, early-maturing pinto and L97B203 an upright, tall pinto, maturing at the same time as the check, Othello. L95B147 is derived from ‘GN Star’/2/3/’Redkloud’/Kentwood/2/Swan Valley’/S/ GN Star/2/2/Redkloud/Kentwood/2/Swan Valley/633B352. GN Star was released by the University of Nebraska in 1975 as a great northern bean with multiple disease resistance (including bacterial wilt) (USDA-ARS, National Genetic Resources Program, 2004). Redkloud is a photoperiod insensitive, light-red kidney bean from New York State, derived from the cross ‘Redkote’/Charlottetown’ (Yellow Eye) and registered in 1974 (Wallace and Enriquez, 1980). Kentwood is an early maturing, high-yield navy bean from AAFC-Harrow, ON (Anonymous, 1973). Swan Valley is a tall and erect navy bean with a narrow profile and few basal branches, released by Michigan State University (Adams et al., 1986). Line 83B352 is an elite great northern line from the University of Guelph. Line L97B203 is derived from DB6278/ISBS82340 with DB6278 being an advanced pinto line of Rogers Brothers, described as an upright bush; ISBS82340 is an elite pinto line from the Idaho Seed Bean Company.

The F1 plants of the cross 980017 were advanced in the greenhouse at Lethbridge and the F2 was grown in Chile during the northern winter, 1998–1999; F2 space-planted progeny rows were grown at Lethbridge in 1999, and a single-plant selection was made on the basis of agronomic (growth habit, maturity) and pinto seed traits. A bulk F2 row was similarly selected and harvested in 2000. Progeny-row yield was added to the selection criteria in F3, conducted as a Modified Augmented Design in 2001. A series of replicated yield tests were grown at Lethbridge and Vauxhall, AB, in 2002 and 2003: two wide-row (60 cm) and one narrow-row (23 cm) tests.

Line L02B662 was tested in the official Canadian Prairie Short Season Wide Row Irrigated Bean Cooperative Registration Trials in 2004 and 2005, at 8 station-years across Alberta and adjoining Saskatchewan. Plants from pods collected at Vauxhall, AB, in 2004 were grown in the greenhouse in Lethbridge, and 315 plants were bulked after examining the seed. This bulked F5 was used to grow the first Breeder Seed lot in 2005, at Parma, ID, USA, through the Idaho Foundation Seed Program.

When averaged over eight trials in 2004 and 2005, Agrinto yielded 3198 kg ha⁻¹ and matured in 107 d, compared with 3256 kg ha⁻¹ for Othello, which matured in 108 d. Agrinto, averaging 44 cm in height over eight sites, has an indeterminate upright growth habit, Type IIb (Schwartz et al., 1996), suitable for wide-row production. Othello, averaging 34 cm in height in the same trials, is Type III, with a prostrate growth habit, while CDC Pintium (only included in 2005), shorter than the other two cultivars, is determinate. Type I with an upright growth habit. Lodging (scored on a 1-to-5 scale, where 1 = upright and 5 = prostrate) at maturity, averaged over six trials was 2.2 for Agrinto and 3.1 for Othello and 1.5 for CDC Pintium (in 2005). The 100-seed weight of Agrinto averaged 33.9 g over eight sites, which is not significantly smaller than that of Othello at 35.2 g.

Agrinto pods are of medium length, while those of Othello are long and those of CDC Pintium medium long. The pod cross-section through the seed is broad elliptic in Agrinto and both check cultivars. No pod curvature is observable for Agrinto, while there is a slight curvature for Othello and CDC Pintium. Pod texture is very smooth for Agrinto. Pods of Agrinto have sparse pigment flecks, contrasted to medium to dense flecks for both Othello and CDC Pintium. The pod distribution on the plant is scattered for Agrinto, partly scattered for CDC Pintium and low for Othello.

Agrinto is resistant (all seedlings healthy) to both the yellow and orange strains of bacterial wilt; while the checks, Othello and CDC Pintium, are moderately resistant to both strains (Hsieh et al., 2005). Agrinto is moderately resistant to white mold, while Othello is susceptible. Agrinto is resistant to race 73, and susceptible to race 1096 of anthracnose, while the check, Othello is susceptible to both races. Agrinto and the Othello check are susceptible to bean common bacterial blight, caused by Xanthomonas axonopodis pv. phaseoli Starr & Garces 1950 emend. (Vauterin et al., 1995) = X. campestris pv. phaseoli (Smith) Dye.

Agrinto has been released on an exclusive basis through a licensing arrangement with the Agricore–United, Bean Business Unit (2002–fifth Avenue North, Lethbridge, AB, Canada T1H 0P1) from whom pedigreed seed may be purchased. Small samples of seed of Agrinto may be obtained from the corresponding author’s organization for at least 5 yr. Application for US Plant Variety Protection is not expected.

Acknowledgments

The technical support of J. Braun, C. Chelle-Anderson, C.R. Daniels, and R.S. Erickson at Lethbridge Research Centre and D.B. Stoesz and W.C. Penner at Morden Research Station, is gratefully acknowledged; as well as the relevant personnel at all cooperating research centres in Canada who conducted the official Canadian Prairie Short Season Wide Row Irrigated Bean Cooperative Registration trials. The financial support of the Agricore-Bean Business Unit, Alberta Pulse Growers, and of the Agriculture and Agri-Food Canada Matching Investment Initiative is gratefully acknowledged.

References