Registration of ‘Freedom’ Soybean

‘Freedom’ soybean [Glycine max (L.) Merr.] (Reg. no. CV-476, PI 636463) was developed as a maturity group V cultivar by the USDA-ARS, Stoneville, MS, in cooperation with the Mississippi Agricultural and Forestry Experiment Station. It was released in October 2002 because of its high yield potential and resistance to southern stem canker [caused by Diaporthe phaseolorum (Cooke & Ellis) Sacc. var. meridionalis F.A. Fernandez].

Freedom originated as an F₅ single plant selection from the cross ‘Hutcheson’ × Pioneer 9641 (Buss et al., 1988). Hutcheson was selected from the cross V68–1034 × ‘Essex’ (Smith and Camper, 1973). V68–1034 was a selection from the cross ‘York’ × PI 71506 (Smith, 1968). Pioneer 9641 was selected from the cross ‘Davis’ × Essex (Caviness and Walters, 1966) and has the same pedigree as ‘Young’ (Burton et al., 1987). The F₁ to F₅ generations were all grown at Stoneville, MS. The F₆ generation was grown in the greenhouse in 1993. The F₂ to F₆ generations of the population were advanced from 1994 to 1995 by the single pod method, which is similar to the single seed descent method (Brim, 1966) except that a single pod rather than a single seed per plant was advanced with each generation of inbreeding. F₃ single plant selections were harvested. F₅ plant rows were planted in 1996 and row DT96–6840 was composted for further evaluation. DT96–6840 was tested in Mississippi by the USDA-ARS for seed yield, disease resistance, and other agronomic traits from 1997 to 2001. It was also evaluated in the Uniform Soybean Tests, Southern States (Preliminary Group V) in 1998 (Tyler, 1998), and again (Uniform Group V) in 1999, 2000, and 2001 (Tyler, 1999; Paris, 2000, 2001).

Freedom has a determinate growth habit, white flowers, gray pubescence, and tan pod walls. Seed are dull yellow with buff hilum. Freedom is classified as Maturity Group V (relative maturity 5.8) and matures about 1 d later than Hutcheson and about 7 d later than ‘Manokin’ (Kenworthy et al., 1996). In 4 yr of testing in USDA Uniform trials, Freedom averaged 84 cm in plant height compared to 74 cm for both Hutcheson and Manokin. The plant lodging score of 2.0 (where 1 = all plants upright and 5 = all plants prostrate) and seed quality score of 2.0 (where 1 = excellent and 5 = poor) of Freedom were similar to those of Hutcheson and Manokin. Freedom averaged a seed weight of 141 mg seed⁻¹, compared to 135 and 123 mg seed⁻¹ for Hutcheson and Manokin, respectively. Seed of Freedom averaged 422 g kg⁻¹ protein, and 199 g kg⁻¹ oil, which is 12 g kg⁻¹ more protein and 9 g kg⁻¹ less oil than Hutcheson. In 43 southern environments, Freedom averaged 3076 kg ha⁻¹, which is a 2 and 8% greater seed yield than Hutcheson and Manokin, respectively. In 15 environments, five locations during 3 yr, in the Mississippi State University soybean variety trials, Freedom averaged 3837 kg ha⁻¹, 18% greater seed yield than Hutcheson (White et al., 2002).

Freedom is resistant to southern stem canker, Soybean mosaic virus (Paris, 2000), and race 10 of Phytophthora sojae (Kaufmann & Gerdes, 2001). Freedom is moderately resistant to southern root-knot nematode [Meloidogyne incognita (Kofoid & White) Chitwood], but susceptible to peanut root-knot nematode [Heterodera arenaria (Neal) Chitwood] and races 2, 3, and 14 of Phytophthora sojae (Kaufmann & Gerdes, 2001). Freedom is moderately resistant to southern root-knot nematode [Meloidogyne incognita (Kofoid & White) Chitwood], but susceptible to peanut root-knot nematode [Heterodera arenaria (Neal) Chitwood] and races 2, 3, and 14 of Phytophthora sojae.

References

Smith, T.J., and H.M. Camper. 1973. Registration of Kentucky Essex (Caviness and Walters, 1966) and races 2, 3, and 14 of Phytophthora sojae (Kaufmann & Gerdes, 2001). Freedom is moderately resistant to southern root-knot nematode [Meloidogyne incognita (Kofoid & White) Chitwood], but susceptible to peanut root-knot nematode [Heterodera arenaria (Neal) Chitwood] and races 2, 3, and 14 of Phytophthora sojae.