Registration of KY98–2047 and KY98–2932
Extra-Dense Pubescence Soybean Germplasm

Soybean [Glycine max (L.) Merr.] germplasm lines KY98–2047 (Reg. no. GP-311, PI 639683) and KY98–2932 (Reg. no. GP-312, PI 639684) were developed by the University of Kentucky and released in September 2004. These lines have value as parents in soybean improvement programs because of their extra-dense pubescence density and their improved agronomic characteristics compared to currently available extra-dense pubescence soybean germplasm. Soybean lines with dense pubescence (either genotype pd1pd1pd2pd2 or pd1pd1pd2pd2) produce an approximately 10-fold increase in leaf trichome density compared to normal pubescence soybean (genotype pd1pd1pd2pd2) while extra-dense pubescence soybean lines (genotype pd1pd1pd2pd2) have double the leaf trichome density of dense pubescence soybean (Gunasinghe et al., 1988; Ren et al., 2000). Extra-dense pubescence soybean lines reduce the field spread of Soybean mosaic virus (Ren et al., 2000), and soybean with increased pubescence density may be valuable in improving drought tolerance (Specht and Williams, 1985).

Both lines were selected as individual F1 plants and composed in the F2 generation. KY98–2047 is from the cross (‘CF492’ × ‘Calhoun’) × KY94–3126 (Pfeiffer et al., 1996; Pfeiffer, 1994). KY98–2932 is from the cross ‘Macon’ × KY94–3121 (Nickell et al., 1996). Lines KY94–3121 and KY94–3126 were extra-dense pubescence selections from the cross ‘Hutcheson’ × L79–1815 (Buss et al., 1988). Dr. R.L. Bernard, USDA-ARS and Univ. of Illinois, produced line L79–1815, near isogenic to ‘Clark’ (Johnson, 1958) containing the dominant alleles of genes Pd1 (from PI 80837) and Pd2 (from genetic type T264).

Leaf abaxial trichome density on field grown plants (counted in 1999 at Lexington, KY) averaged 475 trichomes cm\(^{-2}\) for lines with normal pubescence density, 1600 trichomes cm\(^{-2}\) for lines with dense pubescence and ranged from 2525 to 5500 trichomes cm\(^{-2}\) for lines with extra-dense pubescence. While both registered lines have extra-dense pubescence, KY98–2047 (3475 trichomes cm\(^{-2}\)) has very rugose leaves compared to KY98–2932 (2650 trichomes cm\(^{-2}\)) which has a normal leaf appearance. Both lines are of relative maturity 5.0 maturing at the same time as ‘Manokin’ (Kenworthy et al., 1996). KY98–2047 has purple flowers, gray pubescence, tan pod color, buff hilum color, and determinate growth habit. KY98–2932 has purple flowers, gray pubescence, brown pod color, imperfect black hilum color, and determinate growth habit.

Both lines were tested at three Kentucky environments in breeding tests over 2 yr, in seven environments in the 2002 USDA regional preliminary group V test (Paris, 2003), and in five environments in the 2003 Kentucky Soybean Performance Tests (Lacefield and Pfeiffer, 2003). In the Kentucky breeding tests, the germplasm lines yielded 36% more than the original donor of the Pd1Pd2 alleles (L79–1815, relative maturity 4.2, 3090 kg ha\(^{-1}\)) and 20% more than the mean of the first cycle extra-dense pubescence selections KY94–3121 and KY94–3126 (both relative maturity 5.0, 3440 kg ha\(^{-1}\)). In the USDA regional preliminary tests, KY98–2047 yielded 2760 kg ha\(^{-1}\) and KY98–2932 yielded 2620 kg ha\(^{-1}\). KY98–2932 was significantly lower yielding than Hutcheson (3030 kg ha\(^{-1}\)). In the Kentucky Soybean Performance Tests, KY98–2047 yielded 3660 kg ha\(^{-1}\) and KY98–2932 yielded 3510 kg ha\(^{-1}\), both significantly lower than the maturity group V check cultivar Hutcheson (4290 kg ha\(^{-1}\)). In the USDA regional preliminary tests, neither germplasm line differed significantly from Hutcheson in lodging score, height, seed protein concentration, and seed oil concentration. Seed size in these tests was 140 mg seed\(^{-1}\) for KY98–2047 and 166 mg seed\(^{-1}\) for KY98–2932.

Seeds of KY98–2047 and KY98–2932 will be deposited in the USDA Soybean Germplasm Collection and may be requested from the corresponding author for research purposes, including the development and commercialization of new cultivars. Appropriate recognition is requested if this germplasm contributes to the development of a new cultivar.

T.W. PFEIFFER* and D.L. PILCHER

References


T.W. Pfeiffer and D.L. Pilcher, Dep. Of Agronomy, University of Kentucky, Lexington, KY 40546. Contribution from the Kentucky Agric. Exp. Stn., Lexington. Research supported in part by the Kentucky Soybean Promotion Board. Registration by CSSA. Accepted 31 July 2005. *Corresponding author (tpfeiffe@uky.edu).