Reprinted from *Crop Science*
Vol. 39, No. 2

Registration of PD 94042 Germplasm Line of Upland Cotton with High Yield and Fiber Maturity

PD 94042, a cotton (*Gossypium hirsutum* L.) (Reg. no. GP-695, PI 603219) germplasm line that combines high yield potential and improved fiber maturity, was developed at the Pee Dee Research and Education Center, Florence, SC. This line was released in 1998 by the USDA-ARS and the South Carolina Agricultural Experiment Station.

PD 94042 was derived from the cross of 'Jimian 8'/'PD-3'. Jimian 8 was developed by the Cotton Research Institute, Chinese Academy of Agricultural Sciences. Jimian 8 produces yields equivalent to PD-3, but has lower fiber and yarn tenacity (2). PD-3 is a southeastern USA cultivar combining high lint yield and superior fiber and spinning quality (3). PD 94042 was derived from a F_3 plant selection. The resulting F_4 progeny row was bulked, and agronomic trials were conducted from the F_5 through F_9 generations.

PD 94042 combines high yield potential, a high lint fraction, and improved fiber maturity. Compared with 'Deltapine 51' in the 1997 North Carolina (1) and South Carolina (7) Official State Trials, PD 94042 produced about 12% more lint. PD 94042 produced about 7% more lint yield than 'Deltapine 5415' in the 1997 South Carolina and Georgia (8) Official State Trials, and about 12% more lint yield than the germplasm line PD-3-14 (6) in eight trials conducted between 1994 and 1996 at Florence, SC, Tifton, GA, and Jay, FL (O.L. May, unpublished data). The lint fraction of PD 94042 averages about 41%, compared with 40% for PD-3-14 and Deltapine 5415. Fiber strength of PD 94042 was about 10% less than that of the high-fiber-strength germplasm line PD-3-14 (6) in comparisons from six trials from 1994 to 1996 (O.L. May, unpublished data); but, compared with Deltapine 51 in the 1997 North and South Carolina State Trials (1,7), fiber strength of PD 94042 exceeded that of DP 51 by about 10%, and was equal to Deltapine 5415 in the Georgia and South Carolina trials (7,8). Micronaire reading and 2.5% fiber span length of PD 94042 were similar to those of Deltapine 5415 in the 1997 Georgia and South Carolina State Trials (7,8). Compared with the high-fiber-quality check PD-3-14, PD 94042 tends to produce fiber with a higher micronaire reading. However, the higher micronaire reading of PD 94042 stems from increased fiber maturity (by arealometer measurement from four on-station trials; O.L. May, unpublished data) rather than coarse fiber. Fiber perimeter (by arealometer measurement) of PD 94042 is about the same as that of PD-3-14, while fiber maturity of PD 94042 is about 4% higher.

In the National Cotton Fusarium Wilt Test at Tallassee, AL, 2 yr of data indicate that the reaction of PD 94042 to fusarium wilt [caused by *Fusarium oxysporum* Schlechtend.:Fr. f. sp. *vasinfectum* (Atk.) W.C. Snyder & H.N. Hans.] is intermediate between that of the resistant and susceptible checks (4,5).

PD 94042 should be useful to breeders and geneticists as a source of high yield and increased fiber maturity.

Seed (25 g) of this germplasm line may be obtained from the corresponding author. Recipients of seed are asked to appropriately acknowledge the source of the germplasm if it is used in the development of new germplasm, cultivars, or hybrids.

O. L. MAY* (9)

References and Notes

1. Bowman, D.T. 1997. North Carolina measured crop performance. Soybean and cotton. North Carolina Agric. Res. Ser. Rep. 172.
2. Culp, T.W., and R.F. Moore. 1987. Performance of Chinese and U.S. cottons. p. 115–117. *In* J.M. Brown and T.C. Nelson (ed.) Proc. Beltwide Cotton Res. Conf., Dallas, TX. 4–8 Jan. 1987. Natl. Cotton Council, Memphis, TN.
3. Culp, T.W., R.F. Moore, L.H. Harvey, and J.B. Pitner. 1988. Registration of 'PD-3' cotton. Crop Sci. 28:190.
4. Glass, K.M., and W.S. Gazaway. 1995. Regional cotton fusarium wilt report. Alabama Agric. Exp. Stn. Bull. 189.
5. Glass, K.M., and W.S. Gazaway. 1997. National fusarium wilt cotton report. Alabama Agric. Exp. Stn. Bull. 204.
6. May, O.L., C.C. Green, T.W. Culp, and D.S. Howle. 1996. Registration of PD-3-14 germplasm line of upland cotton. Crop Sci. 36:1718.
7. May, O.L., M.J. Sullivan, D.K. Barefield, Jr., and G.M. Veasy. 1997. Part II. Performance of cotton cultivars and strains in South Carolina. *In* Performance of field crops in South Carolina: Section 3—Cotton. S.C. Agric. Exp. Stn. Circ. 184.
8. Raymer, P.L., J.L. Day, A.E. Coy, S.H. Baker, W.D. Branch, and S.S. LaHue. 1997. 1997 field crops performance tests: Soybean, peanut, cotton, tobacco, sorghum, grain millet, and summer annual forages. Ga. Agric. Exp. Stn. Res. Rep. 648.
9. O.L. May, USDA-ARS and Dep. of Crop and Soil Environ. Sci., Clemson Univ., Pee Dee Res. & Educ. Ctr., 2200 Pocket Rd., Florence, SC 29506-9706. Registration by CSSA. Accepted 30 Sept. 1998. *Corresponding author (cotton@florence.ars.usda.gov).

I thank Oliver Heath and Debbie Cottingham for technical assistance, Shelby Baker and Tony Peacock for testing Pee Dee strains, and Wes Malloy for conducting the cotton winter nursery.

Published in Crop Sci. 39:597–598 (1999).