

### REGISTRATION OF 'SUSQUEHANNA' WHEAT

'SUSQUEHANNA' (Reg. no. 750) (PI 474581) is a soft red winter wheat (*Triticum aestivum* L.) developed by the Maryland Agricultural Experiment Station, Department of Agronomy, and jointly released in 1988 by the Maryland Agricultural Experiment Station and the Cornell Agricultural Experiment Station. It was previously released as 'MD 286' wheat germplasm and registered with the Crop Science Society of America (GP no. 224) (1). Susquehanna has been released as a cultivar to provide a high yielding, stiff strawed, winter hardy, disease resistant soft red winter wheat with good milling and baking quality that is adapted to the colder regions of the Middle Atlantic and Northeast region of the USA.

Susquehanna originated from a complex series of crosses made by T.M. Starling at Virginia Polytechnic Institute and State University, Blacksburg, VA. The pedigree is VA 68-26-331/6/'Thorne'\*5/199-4/5/ Thorne/4/'Taylor'\*2/'Norin 10'/'Brevor'/3/unknown parent. Cultivar development procedures are described in the earlier publication (1). This line was evaluated in preliminary tests for four years (1974-1978) at one location in Maryland, and in statewide trials from 1979 to 1982. In addition, it was regionally tested in the Uniform Southern Soft Red Winter Wheat Nursery (1981) and the Uniform Eastern Soft Red Winter Wheat Nursery (1982) throughout the southern and eastern USA. This line has been tested more recently in New York State (1985-1988), and has exhibited superior yield and agronomic performance in that region leading to the cultivar release decision.

Yield and other performance data for Susquehanna under Maryland conditions are summarized in the previous germplasm registration article (1). In New York tests from 1985 to 1988, Susquehanna yielded an average of 5235 kg ha<sup>-1</sup> over eight environments, which was similar to 'Geneva' and 5% greater than 'Houser' and 'Tyler'. Among soft red winter wheat cultivars tested in New York, Susquehanna has been consistently a superior entry, one of only a few that appears to be well-adapted that far north in the eastern soft wheat region.

Susquehanna is similar in plant height to Geneva and Houser, and about 50 mm taller than Tyler. It is characterized by excellent straw strength with superior lodging resistance. The spike is apically awnletted and medium-long. Glumes are white to cream at maturity. Kernels are midsize, soft, and ovate. Spike emergence is midseason, equivalent to Tyler, about 2 d later than Geneva, and 1 d earlier than Houser. Susquehanna has excellent winter hardiness in the region. Test weight has averaged 746 g L<sup>-1</sup>, similar to that for Geneva and Tyler, and 36 g L<sup>-1</sup> greater than Houser. Susquehanna has good milling and baking quality characteristics, and above average but acceptable flour protein for a soft wheat.

Susquehanna is resistant to the races of powdery mildew (incited by *Erysiphe graminis* DC. f. sp. *tritici* em. Marchal) present in Maryland and New York. It also possesses field resistance to leaf rust (incited by *Puccinia recondita* Rob. ex Desm. f. sp. *tritici*) races in the region. Breeder seed of Susquehanna will be maintained by the Maryland Agricultural Experiment Station, Department of Agronomy, University of Maryland, College Park, MD 20742; and by the New York Seed Improvement Cooperative, 249 Emerson Hall, Cornell University, Ithaca, NY 14853.

Authorized seed classes will be breeder, foundation, and certified. The releasing stations will not apply for variety protection under the Plant Variety Protection Act.

D.J. SAMMONS\* AND M.E. SORRELLS (2)

### References and Notes

1. Sammons, D.J., and P.S. Baenziger. 1984. Registration of MD 286 Wheat Germplasm. *Crop Sci.* 24:391-392.
2. D.J. Sammons, Dep. of Agronomy, Univ. of Maryland, College Park, MD 20742; and M.E. Sorrells, Dep. of Plant Breeding and Biometry, 252 Emerson Hall, Cornell Univ., Ithaca, NY 14853-1902. Scientific Article no. A-4902, and Contribution no. 7944 of the Maryland Agric. Exp. Stn., Dep. of Agronomy, College Park, MD 20742. Registration by CSSA. Accepted 31 May 1989. \*Corresponding author.

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## REGISTRATION OF GERMPLASMS

### REGISTRATION OF FIVE COTTON GERMPLASM LINES WITH RESISTANCE TO BOLLWORM, TOBACCO BUDWORM, AND BOLL WEEVIL

FIVE noncommercial germplasm lines of cotton, *Gossypium hirsutum* L., of diverse ancestry with resistance to bollworm, *Heliothis zea* (Boddie), tobacco budworm, *H. virescens* (Fabricius), and boll weevil, *Anthonomus grandis* (Boheman), were released by USDA-ARS and the South Carolina Agricultural Experiment Station in 1988. These germplasm lines should be useful in cotton improvement programs, particularly if effective insecticides are lost to production or if insects develop resistance to the chemicals.

PD 0648 (Reg. no. GP-394, PI 533629) was developed from the cross PD 695 × 'Deltapine 7146N'. PD 695 is a frego bract germplasm line with resistance to *Heliothis* spp. and boll weevil (1). Deltapine 7146N is a nectariless cultivar, developed by Delta and Pine Land Co., with resistance to tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois).

PD 0683 (Reg. no. GP-395, PI 533630) was developed

from the cross PD 695 × PD 869. These frego bract germplasm lines possess resistance to *Heliothis* spp. and boll weevil (1,2). PD 869 is later maturing than PD 695 and is not as prone to cut-out during hot, dry weather.

PD 0723 (Reg. no. GP-396, PI 533631) was developed from the cross PD 695 × 5-718. The frego bract line 5-718, which may have resistance to *Heliothis* spp. and boll weevil, was developed by J.B. Weaver at the Georgia Agricultural Experiment Station.

PD 0878 (Reg. no. GP-397, PI 533632) was developed from the cross TX-ORS-75C × Deltapine 7146N. TX-ORS-75C is a very early maturing, frego bract, okra, and smooth-leaf germplasm line developed by L.S. Bird at the Texas Agricultural Experiment Station.

PD 0948 (Reg. no. GP-398, PI 533633) was developed from the cross TX-ORS-75C × PD 875. PD 875 is an early maturing, normal-bract germplasm line with resistance to boll weevil and *Heliothis* spp. (1).

When insects were controlled in four replicated tests from 1981 through 1984, these five germplasm lines produced lint

yields equal to or superior to those of the check cultivars, SC-1, Coker 310, and Coker 201. Lint yields of all germplasm lines were usually superior to those of PD 695, PD 8619, and 'PD-2', which usually cut out during dry, hot weather.

Most of these germplasm lines produced significantly more lint than the normal bract cultivars, Coker 201 and Coker 310, when boll weevils were controlled with azinphosmethyl and *Heliothis* spp. were controlled with fenvalerate after damaged squares reached 10% or when two live larvae were found per 100 terminals on PD 695. Most of these germplasm lines also produced superior yields to those of the resistant checks, PD 695, PD 875, PD 8619, PD-2, and SC-1. This resistance may be at least partially attributed to the earliness of these five germplasm lines. Progenies were selected for resistance to *Heliothis* spp. under natural infestations of these insects that developed under this insecticide regime. Some natural outcrossing also occurred under this insecticide regime that will account for some off-type plants.

When *Heliothis* spp. were controlled with fenvalerate and boll weevils were allowed to cause 10% damaged squares on Coker 310 before being controlled with azinphosmethyl, the five germplasm lines generally produced more lint than the check cultivars, SC-1, Coker 201, and Coker 310, and the resistant checks, PD 695, PD 875, PD 8619, and PD-2.

Although these five cotton lines with diverse germplasm have high yield potential, resistance to insects, and environmental stability to a range of growing conditions, fiber properties are similar to those of Coker 201.

Seed (25 g) of these germplasm lines may be obtained from C.C. Green, USDA-ARS, P.O.Box 2131, Florence, SC 29503.

T. W. CULP,\* C. C. GREEN, AND B. U. KITTRELL (3)

#### References and Notes

1. Culp, T.W. 1979. Registration of Pee Dee 695 and Pee Dee 875 germplasm lines of cotton. *Crop Sci.* 19:751.
2. Culp, T.W., A.R. Hopkins, and H.M. Taft. 1979. Breeding insect-resistant cottons in South Carolina. *South Carolina Agric. Exp. Stn. Techn. Bull.* 1074.
3. Culp, T.W. and C.C. Green, USDA-ARS, P.O.Box 2131, Florence, SC 29503; and B.U. Kittrell, Pee Dee Res. and Education Ctr., Route 1, Florence, SC 29501-9603. Registration by CSSA. Accepted 30 June 1989. \*Corresponding author.

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### REGISTRATION OF TWELVE NONCOMMERCIAL GERmplasm LINES OF UPLAND COTTON WITH RESISTANCE TO BOLLWORM, TOBACCO BUDWORM, AND BOLL WEEVIL

TWELVE noncommercial cotton, *Gossypium hirsutum* L., germplasm lines (Reg. no. GP-399 through GP-410) (PI 533634 through PI 533645) with resistance to tobacco budworm, *Heliothis virescens* (Fabricius), bollworm, *H. zea* (Boddie), and boll weevil, *Anthonomus grandis* (Boheman), were released by USDA-ARS and the South Carolina Agricultural Experiment Station in 1988. These 12 germplasm lines, PD 0738, PD 0741, PD 0747, PD 0753, PD 0756, PD 0761, PD 0762, PD 0771, PD 0778, PD 0781, PD 0785, and PD 0804 were developed from the cross PD 695 × PD 875. PD 695, a frego bract germplasm line, and PD 875, a normal bract line are resistant to *Heliothis* spp. and boll weevil (1).

When insects were controlled in replicated tests conducted over 4 yr, all of these germplasm lines produced lint yields equal or superior to those of the check cultivars, SC-1, Coker 310, and Coker 201. Most of these germplasm lines produced

significantly more lint than that of PD 695 and PD 8619 (2), suggesting greater environmental stability.

All germplasm lines produced significantly more lint than the commercial cultivars Coker 201 and Coker 310 when boll weevil were controlled with azinphosmethyl and *Heliothis* spp. were controlled with fenvalerate after damaged squares reached 10% or when two live larva were found per 100 terminals on PD 695. Most of these germplasm lines also produced more lint than the *Heliothis* spp. resistant cottons, SC-1, PD 695, and PD 875. Progenies were selected for resistance to *Heliothis* spp. under natural infestations of these insects that developed under this insecticide regime. Some natural outcrossing also occurred under this spray program, which accounts for some off-type plants.

When *Heliothis* spp. were controlled with adequate applications of fenvalerate and boll weevil were allowed to cause 10% damaged squares on Coker 310 before being controlled with azinphosmethyl, eight of the germplasm lines, PD 0741, PD 0756, PD 0761, PD 0762, PD 0778, PD 0781, PD 0785, and PD 0804, which have predominantly frego bract plants, produced significantly higher yields than PD 695 and PD 875. These data suggest that these eight germplasm lines have higher levels of resistance than the parental lines and have greater environmental stability. PD 0738, PD 0747, PD 0753, and PD 0771, which have predominantly normal bract plants, produced yields equivalent or superior to that of PD 695, suggesting that their high prolificness and early maturity provides escape from the boll weevil. Progenies were selected for boll weevil resistance under natural infestations of this insect that developed under this insecticide regime.

These 12 germplasm lines differ in fiber length and micronaire but have fiber and yarn strengths equal to that of PD 695. Fiber and yarn strength of PD 695 is intermediate between that of Coker 201 and SC-1.

These germplasm lines with resistance to *Heliothis* spp., boll weevil, and adverse growing conditions should be useful germplasm in cotton improvement programs particularly if insects develop resistance to insecticides or if effective insecticides are disallowed in cotton production.

Seed (25 g) of these germplasm lines may be obtained from C.C. Green, USDA-ARS, P.O.Box 2131, Florence, SC 29503.

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#### References and Notes

1. Culp, T.W. 1979. Registration of Pee Dee 695 and Pee Dee 875 germplasm lines of cotton. *Crop Sci.* 19:751.
2. Culp, T.W., and D.C. Harrell. 1979. Registration of Pee Dee 8619 germplasm line of cotton. *Crop Sci.* 19:753.
3. Culp, T.W., C.C. Green, USDA-ARS, P.O.Box 2131, Florence, SC 29503; and B.U. Kittrell, Pee Dee Res. and Education Ctr., Route no. 1, Florence, SC 29501-9603. Registration by CSSA. Accepted 30 June 1989. \*Corresponding author.

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### REGISTRATION OF SEVEN GERmplasm LINES OF UPLAND COTTON WITH RESISTANCE TO BOLLWORM, TOBACCO BUDWORM, AND BOLL WEEVIL

SEVEN noncommercial germplasm lines of cotton, *Gossypium hirsutum* L., of diverse ancestry with resistance to bollworm, *Heliothis zea* (Boddie), tobacco budworm, *H. virescens* (Fabricius), and boll weevil, *Anthonomus grandis* (Boheman), were released by USDA-ARS and the South Car-