

It is resistant to prevalent races of stem rust (caused by *Puccinia graminis* Pers. f. sp. *tritici* Eriks. and E. Henn.); moderately resistant to common root rot [caused by *Bipolaris sorokiniana* (Sacc. in Sorok.) Shoem. and *Fusarium* sp.] and common bunt [caused by *Tilletia foetida* (Wallr.) Liro and *Tilletia caries* (DC.) Tul.]; and moderately susceptible to loose

smut [caused by *Ustilago tritici* (Pers.) Rostr.].

The Canadian Expert Committee on Grain Quality has rated Sinton equal in breadmaking quality to 'Marquis' and Manitou. A more detailed description of the cultivar has been published.⁴

Breeder seed is being maintained at the Research Station, Agriculture Canada, Regina, Saskatchewan. S4P 3A2.

Registration of Germplasms

REGISTRATION OF BW76-31 COTTON GERMPLASM¹ (Reg. No. GP 162)

L. G. Stokes and W. P. Sappenfield²

THE BW76-31 cotton (*Gossypium hirsutum* L.) was released as a germplasm line by the Missouri Agric. Exp. Stn., 31 Jan. 1981.

BW76-31 cotton is a doubled haploid with high gossypol. A haploid of an F₄ plant from the cross {XG15-1 × [(Delcot 277 × 'MoDel') F₁ × Delcot 277] BC₁S₃} F₄ was derived via semigamy (4) and doubled to produce BW76-31. XG15-1 was a selection derived from [(Deltapine 15 × 'Socorro Island') F₂ × M11] F₃. Socorro Island was a wild *Gossypium hirsutum* possessing high flower bud gossypol (3). M11 was a doubled haploid derived from the 'Empire' cultivar (1).

BW76-31 is a prolific, early-maturing, storm resistant, small-bolled, determinate to semi-determinate line that produces a 2X normal amount of gossypol and/or other terpenoid-like grandular components in flower buds and vegetative parts.

BW76-31 is resistant to *Xanthomonas malvacearum* (E. F. Sm.) Dows; races 1 and 11 and moderately tolerant to the Verticillium wilt pathogen caused by *Verticillium dahliae* Kleb. It is moderately tolerant to the Fusarium wilt-root knot disease complex incited by *Fusarium oxysporum* Schlecht. f. *vasinfectum* (Atk.) Synd. and Hans. and *Meloidogyne incognita* (Kofoid and White) Chitwood (2). BW76-31 is sensitive to *Cercospora-Alternaria* leaf blight complex, frequently causing premature defoliation.

BW76-31 produces lint yields of approximately 80% of the yield of standard commercial varieties. Plants tend toward dwarfness with soil or moisture stress. Adaptation is narrow. Flower bud gossypol averaged 1.03% for BW76-31 and 0.52% for Stoneville 213.¹

Seed index of BW76-31 compared with Stoneville 213 averaged 11.3 vs. 12.0 g; lint fraction 35.5% vs. 36.7%; boll size 4.4 vs. 5.9 g; 2.5% span fiber length 27.4 mm vs. 28.5 mm; fiber length uniformity ratio 48 vs. 46; fiber micronaire units 4.7 vs. 4.8; T₁ fiber strength (cN/tex) 20.60 vs. 17.79; yarn tenacity (cN/tex) 11.40 vs. 12.86; and E₁ fiber elongation (%) 9.34 vs. 9.51.

The doubled haploid genetic stability, high gossypol producing capabilities, dwarf and prolific fruiting plant type, moderate yield, disease resistance potentials, acceptable boll, seed, ginning and fiber quality characteristics all contribute to the potential usefulness of BW76-31 as a germplasm source of high gossypol and for inter/intra-specific hybrid cotton development.

Seed of BW76-31 will be maintained by the Missouri Agricultural Experiment Station and small quantities can be obtained from W. P. Sappenfield, University of Missouri, Delta Center, P.O. Box 160, Portageville, MO 63873.

ACKNOWLEDGMENTS

Grateful acknowledgement is given to L. E. Treece and Jimmie Nell Ward, senior research technicians, for their dedicated assistance; to all Delta Center support personnel, and to Cotton, Inc., for their financial support of research.

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- Registered by the Crop Sci. Soc. Am. Published with approval of the Director of the Missouri Agric. Exp. Stn. as Journal Article No. 8778. Accepted 3 June 1981.
- Former research specialist, Dep. of Entomology (now private business) and professor, Dep. of Agronomy, Univ. of Missouri College of Agric. and Agric. Exp. Stn. Delta Center, Portageville, MO 63873.

REGISTRATION OF HYC76-59 COTTON GERMPLASM¹ (Reg. No. GP 163)

W. P. Sappenfield²

HYC76-59 cotton (*Gossypium hirsutum* L.) was released as a germplasm line by the Missouri Agric. Exp. Stn., 2 Feb. 1981.

HYC76-59 originated as a single F₅ plant selected from a bulk planting of HYC74-283. HYC74-283 was a single F₂ plant selection of HYC MDR-1. HYC MDR-1 was a mass cross involving 'Half & Half,' 'Quapaw,' 'Stripper 31,' 'Paymaster 18' and MO59-1021 as female parents and 71CX-15 and 71C-18 as male parents. The males were the multiple disease resistant donor parents.

HYC76-59 is a prolific, early-maturing, short-season, determinate to semi-determinate, multiple disease resistant line with short, coarse fiber.

HYC76-59 approaches field immunity to bacterial blight caused by *Xanthomonas malvacearum* (E. F. Sm.) Dows; races 1, 2, 7, 10, 11, 12, 18.

HYC76-59 is tolerant to the Verticillium wilt pathogen, *Verticillium dahliae* Kleb. It is resistant to the Fusarium wilt-root knot nematode disease complex incited by *Fusarium oxysporum* Schlecht. f. *vasinfectum* (Atk.) Synd. and Hans. and *Meloidogyne incognita* (Kofoid and White) Chitwood.

HYC76-59 has produced excellent lint yields on sandy loam and clay soils. It has been very productive on southeast Missouri sandy loam soils in plantings made after 15 May. In delayed plantings on sandy loam and clay soils, 1977-79, HYC76-59 averaged 10 to 12% higher lint yields than 'Coker 304,' 'Stoneville 213' and 'McNair 235.' Seed index of HYC76-59 compared with Stoneville 213 averaged 11.7 vs. 12.6 g; lint fraction 37.5% vs. 37.4%; boll size 6.63 vs. 6.15 g; 2.5% span fiber length 26.7 mm vs. 28.2 mm; fiber length uniformity ratio 49 vs. 47; fiber micronaire units 5.6 vs. 4.6; T₁ fiber

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strength (cN/tex) 19.68 vs. 18.72; yarn tenacity (cN/tex) (1978) 10.40 vs. 10.60; and E_1 fiber elongation (%) 6.56 vs. 8.29.

High productivity potential, early maturity, multiple disease resistance and fiber characteristics of HYC76-59 are important considerations for its use in cotton breeding and development of inter/intra-specific hybrid cultivars.

Seed of HYC76-59 will be maintained by the Missouri Agricultural Experiment Station. Small quantities of seed can be obtained from W. P. Sappenfield, University of Missouri, Delta Center, P.O. Box 160, Portageville, MO 63873.

ACKNOWLEDGMENTS

Grateful acknowledgment is given to L. E. Treece and Jimmie Nell Ward, senior research technicians for their dedicated assistance; to all Delta Center support personnel; and to Cotton, Inc., for their financial support of research.

REGISTRATION OF PEE DEE 4548 GERMPLASM LINE OF COTTON¹ (Reg. No. GP 161)

T. W. Culp²

PEE Dee 4548 (GP 161), an improved breeding line of upland cotton (*Gossypium hirsutum* L.) was released to plant breeders and geneticists by AR-SEA-USDA, and the South Carolina Agric. Exp. Stn. in 1981. This breeding stock possesses high yield potential, high fiber and yarn strength, unusually high lint percentage, and wide adaptation.

PEE Dee 4548 is from the seed increase of a single F_3 plant from the cross PEE Dee 4381³ × PEE Dee 8623. PEE Dee 8623 was developed from a series of crosses involving 'Coker 421,' Triple Hybrid 171, Sealand 7, Earlistaple, C 6-5, and 'Dixie King.'

The simultaneous improvement of lint yield and fiber strength has been a persistent problem in cotton breeding. PEE Dee 4548 produced lint yields equivalent to those of SC-1, the highest yielding check cultivar, and fiber and yarn strengths significantly above those of PEE Dee 2165, the superior fiber quality check, from 3 years of testing in South Carolina and Georgia. PEE Dee 4548 produced the highest average lint yield among the breeding lines with improved fiber strength in the 1978 Regional High Quality Test. Its yields also were comparable with those of the check cultivars, 'Stoneville 213' and 'Coker 310,' and its fiber strength and yarn tenacity approached that of 'Acala SJ-5.' The high lint yield probably resulted from more than 5% increase in lint percentage over that of the check cultivars and the wide adaptation of this breeding line. Since PEE Dee 4548 has the highest lint percentage and the widest range of adaptability of any high quality breeding line that we have developed, it should be valuable germplasm for use in cotton improvement programs.

Seed (25 g) of PEE Dee 4548 may be obtained from AR-SEA-USDA, PEE Dee Experiment Station, P.O. Box 2131, Florence, SC 29503.

¹Registered by the Crop Sci. Soc. of Am. Published as Journal Paper 1913 of the South Carolina Agric. Exp. Stn. Accepted 3 June 1981.

²Research agronomist, AR-SEA-USDA, PEE Dee Experiment Station, Florence, SC 29503.

³Harrell, D. C., and T. W. Culp. 1979. Registration of PEE Dee 4381 germplasm line of cotton. Crop Sci. 19:418.

REGISTRATION OF WH-1 BLUE LUPINE GERMPLASM¹ (Reg. No. GP 1)

Homer D. Wells and John D. Miller²

WH-1 blue lupine (*Lupinus angustifolius* L.), a winterhardy selection from P.I. 168,535, was jointly released by AR-SEA-USDA and the Univ. of Georgia Agric. Exp. Stn. An introduction from Portugal, P.I. 168535 apparently was a heterogeneous mixture or heterozygous for a number of factors because other valuable traits have been found in this introduction (1, 2, 3, 4).

During late December 1958 the temperature dropped to ca - 18 C

at the Georgia Mountain Stn., Blairsville, and all breeding lines and introductions of blue lupines were killed except for P.I. 168,535. Although some plants of this introduction were severely damaged, a few plants showed only minor leaf-tip-burn. In mid-January 1959, a few of the plants showing the least cold damage were transplanted to Tifton and constitute the parent line of WH-1.

WH-1 blue lupine is a freeze tolerant, gray leaf spot (incited by *Stemphylium solani* Weber and *S. botryosum* Walls.) resistant, fine-stemmed, branching phenotype that grows slowly at cool temperatures; has a dark-green, purplish cast plant color that is accentuated during cool weather; is bitter (high alkaloid) and late maturing. Seeds are small, cream-colored with tan specks, shatter immediately after pods mature and have an extremely impervious seed coat after drying.

Because of its freeze tolerance WH-1 can grow without damage at temperatures of 5 to 10 C lower than other cultivars or breeding lines of blue lupines. The additional freeze resistance apparently is conditioned by one major dominant gene and a number of modifiers (3). A portion of the resistance may be directly related to the slower growth during cool temperatures and later maturity, but we have not been able to separate these factors in 'Frost' and 'Tifblue-78' cultivars developed from this source of winterhardiness.

Breeder seed will be maintained by AR-SEA-USDA at the Coastal Plain Station, Tifton, Georgia. Small quantities (up to 50 g) will be provided forage researchers upon written request. Address requests to Drs. Miller or Wells, Coastal Plain Station, Tifton, GA 31793.

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²AR-SEA-USDA, plant pathologist and agronomist, respectively.

REGISTRATION OF SIX PEANUT GERMPLASM LINES¹ (Reg. Nos. GP 12 to GP 17)

Ray O. Hammons²

SIX lines of peanut (*Arachis hypogaea* L.) were released to scientists by AR-SEA-USDA and the University of Georgia Agric. Exp. Stn., Coastal Plain Station in March 1981. These lines possess resistance to *Cylindrocladium* black rot (CBR), a disease caused by the soil-borne fungus *Cylindrocladium crotalariae* (Loos) Bell and Sobers [perfect state, *Calonectria crotalariae* (Loos) Bell and Sobers].³ There is no known effective control using chemicals or cultural practices.

The new peanut lines were developed by a repeated single-plant selection program. About 25,000 seedlings from 1,072 germplasm accessions were grown in media infested with a homogenized blend of five 14-day-old cultures of *C. crotalariae*. Seedlings showing no lesions after 9 days in growth chambers were transplanted to soil. Following seed increase, two or more additional cycles of individual progeny selection for resistance were practiced.

¹Registered by the Crop Sci. Soc. of Am. Accepted 3 June 1981.

²Supervisory research geneticist AR-SEA-USDA, Crops Research, cooperative with Univ. of Georgia College of Agriculture Coastal Plain Station, Tifton, GA 31793.

³Bell, D. K., and E. K. Sobers. 1966. A peg, pod, and root necrosis of peanuts caused by a species of *Calonectria*. Phytopathology 56:1361-1364.