

fumigated, and infested with PA. All subsequent screening tests in the development of N-2 involved the screening of young seedlings for PA resistance, followed by the infestation of PA-resistant selections with YCA after selected plants were cut back and fumigated. Resistant plants selected for propagation were intercrossed at random by honey bees (*Apis mellifera*) in a greenhouse cage, or were transplanted to isolated field plots for interpollination.

Following the fourth selection cycle for YCA resistance and the second for PA resistance, a "resistant composite" was formed that consisted of open-pollinated seed from each of 322 plants. Each of the 27 plants (representing 13 entries) initially selected for YCA resistance could have contributed germplasm to these 322 plants. However, only six maternal sources were represented in the pedigrees of the 322 plants. These sources and the percentages of the 322 plants each contributed were as follows: Chesapeake, 63%; Beltsville Early Flowering Synthetic, 15%; Maryland Selection 67-A2, 10%; Illinois No. 2, 8%; Beltsville Medium Flowering Synthetic, 3%; and Illinois No. 1, 1%. The level of resistance to both aphids in the resistant composite was substantially greater than that in the original germplasm sources. The percentage of YCA-resistant plants increased from 0.3% in the initial screening to 95.6% in the resistant composite (fifth selection cycle). Similarly, PA resistance increased from 27.5% resistant plants in the first screening test (germplasm in this test had undergone two cycles of selection for YCA resistance) to 93.7% in the resistant composite following the third screening test for PA resistance. N-2 is based on 198 plants highly resistant to both aphids that were selected from the resistant composite during the third selection cycle for PA resistance and the fifth selection cycle for YCA resistance. All seed harvested from the 198 resistant plants was bulked to form N-2.

N-2 was developed and released cooperatively by the USDA, SEA, AR, and the Nebraska Agricultural Experiment Station. Small quantities of seed are available upon request from the Department of Agronomy, University of Nebraska, Lincoln, NE 68583.

¹Registered by the Crop Sci. Soc. Am. Contribution from the USDA, SEA, AR and the Nebraska Agric. Exp. Stn., Lincoln. Published as Paper No. 5635, Journal Series, Nebraska Agric. Exp. Stn. Research was conducted under Nebraska Agric. Exp. Stn. Projects 12-27, 12-88, and 17-27. Accepted 22 Jan. 1979.

²Supervisory research geneticist and research entomologist, USDA, SEA, AR, and foundation professor of agronomy, Univ. of Nebraska, Lincoln, NE 68583, respectively.

³Goetz, H. J., G. R. Manglitz, and F. A. Haskins. 1979. Selection for yellow clover aphid and pea aphid resistance in red clover. Crop Sci. 19:257-260.

REGISTRATION OF PEE DEE 0259 AND PEE DEE 2165 GERMPLASM LINES OF COTTON¹

(Reg. No. GP 39 and GP 40)

D. C. Harrell and T. W. Culp²

Two breeding lines of cotton (*Gossypium hirsutum* L.) with extra fiber strength were released by the South Carolina Agricultural Experiment Station and AR-SEA-USDA in 1966. Each line showed a major improvement in lint yield, while it maintained a major portion of the extra fiber strength of the parents.

Pee Dee 0259 (GP 39) and Pee Dee 2165 (GP 40) were developed from a series of crosses involving Triple Hybrid 108 and 171, AHA 6-1-4, 'Earlistaple', 'Sealand 542', and C 6-5. Both

germplasm lines were increased from the bulk seed from the progeny of a single plant selected in the F₃ generation. Pee Dee 0259 and Pee Dee 2165 have been tested under the designation AC-NA 259 and AC-FJA 165, respectively.

Pee Dee 0259 produces about 90% as much lint as 'Coker 201' and its lint percentage, fiber length, and micronaire are equivalent in value. Fibers of Pee Dee 0259 are 10% stronger than those of this commercial check. Pee Dee 0259 matures early and has a strong tendency to be determinate in growth habit, particularly under stress conditions. It lacks storm resistance.

Pee Dee 2165 has better lint percentage, fiber length, and fiber strength than Pee Dee 0259 and most southeastern cultivars. Its 15% improvement in fiber strength also gives a 15% yield reduction relative to these characteristics in Coker 201. Pee Dee 2165 has proven to be a good combiner and has been used successfully to improve the fiber quality and earliness of commercial cultivars.

Pee Dee 0259 and Pee Dee 2165 represent a significant step in overcoming the adverse relationship between yield potential and fiber strength in upland cotton. Seed (25 g) of each breeding stock may be obtained from AR-SEA-USDA, Pee Dee Experiment Station, Florence, SC 29503.

REGISTRATION OF PEE DEE 4381 GERMPLASM LINE OF COTTON¹

(Reg. No. GP 41)

D. C. Harrell and T. W. Culp²

PEE DEE 4381 (GP 41), a breeding line of cotton (*Gossypium hirsutum* L.) with extra fiber strength, was released by the South Carolina Agricultural Experiment Station and AR-SEA-USDA, in 1968. This breeding line represents a major improvement in lint yield while it maintains a portion of the extra fiber strength of the parents.

Pee Dee 4381 was selected from the cross of 'Auburn 56' × AC 239. AC 239 is a PD line developed from the cross of Hybrid 313 or Line A with the California breeding line C 6-5. Line A was developed from complex crosses involving Triple Hybrid 171, 'Sealand 7', and 'Earlistaple'. Auburn 56 is resistant to fusarium wilt (incited by *Fusarium oxysporium* F. vasinfectum) and root-knot nematode (*Meloidogyne* spp.). It was developed by the Alabama Agricultural Experiment Station³. Pee Dee 4381 is from the increase of the bulk seed of the progeny of a single plant selection in the F₃ generation.

Pee Dee 4381 produces lint yields that approach (5% less) those of 'Coker 201', but it has fibers that are 10% stronger. Fiber length, micronaire, and other agronomic properties are equivalent to these characteristics in the Coker 201 check. Pee Dee 4381 represents a significant step in overcoming the negative association of lint yield and fiber strength in upland cotton.

Pee Dee 4381 has a high level of resistance to the fusarium wilt root-knot nematode complex. In the 1967 Wilt Screening Test at Tallahassee, Ala., it had 0.4% wilt compared with 67.2% for the nearest 'Rowden' check. The combination of genes for extra fiber strength, and resistance to fusarium wilt and root-knot nematodes in a single breeding line should be advantageous in cotton improvement programs.

Pee Dee 4381 has combined with other PD and Georgia high quality breeding lines to give superior selections with disease resistance, early maturity, and improved fiber quality. Seed (25 g) of this breeding line may be obtained from AR-SEA-USDA, Pee Dee Experiment Station, Florence, SC 29503.

¹Registered by the Crop Sci. Soc. Am. Published as Journal Paper 1633 of the South Carolina Agric. Exp. Stn. Accepted 5 Mar. 1979.

²Research agronomist (retired) and research agronomist, AR-SEA-USDA, Pee Dee Exp. Stn., Florence, SC 29503.

³Smith, A. L. 1964. Registration of Auburn 56 cotton. Crop Sci. 4:446.

¹Registered by the Crop Sci. Soc. Am. Published as Journal Paper 1632 of the South Carolina Agric. Exp. Stn. Accepted 5 Mar. 1979.

²Research agronomist (retired) and research agronomist, AR-SEA-USDA, Pee Dee Exp. Stn., Florence, SC 29503.