

those of leading southeastern cultivars, but they have fibers that are 18% stronger. These two breeding lines differ significantly in fiber properties. Pee Dee 9232 is equivalent to 'Coker 201' in fiber length and micronaire, but Pee Dee 9223 is superior to them.

Pee Dee 9241 was developed from the cross of Coker 421 × PD 4398. Pee Dee 4398 was developed from the cross of FTA 263 × 'Atlas'. FTA 263 was developed from a complex series of crosses involving Triple Hybrid 108 and 171, AHA 6-1-4, Earlistaple, and Sealand 542 in the Pee Dee breeding program. Atlas was developed from related material in the Georgia Agricultural Experiment Station cotton breeding program. Pee Dee 9241 is from the increase of seed from a single F_3 plant selection.

Pee Dee 9241 possesses excellent fiber properties with unusually high fiber elongation. It combines well with other PD lines and gives excellent combinations of fiber quality and yield. Pee Dee 9241 is extremely susceptible to the fusarium-wilt (caused by *Fusarium oxysporium* F. spp. *vasinfectum*) root-knot-nematode complex (*Meloidogyne* spp.), and to verticillium wilt (caused by *Verticillium* spp.).

Pee Dee 9363 and Pee Dee 9364 were developed from a complex composite cross involving 'Carolina Queen', Triple Hybrids 108 and 171, AHA 6-1-4, Earlistaple, Sealand 542, and C 6-5. Each line is from a single F_3 plant selection.

Pee Dee 9363 and Pee Dee 9364 produce yields equivalent to Coker 201, but their fibers are 20% stronger. Other agronomic and fiber properties of Pee Dee 9363 are equivalent to Coker 201, but those of Pee Dee 9364 are superior.

These five breeding lines are derived from crosses with southeastern commercial cultivars, Coker 421, Atlas, and Carolina Queen. Although numerous crosses of this type have been made, this is the second series of crosses that have led to improved breeding lines. Studies indicate the success in breaking the genetic linkages that control the negative association between lint yield and fiber strength.¹

Seed (25 g) of these breeding lines 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 1634 of the South Carolina Agric. Exp. Stn. Accepted 2 July 1979.

²Research agronomist and research agronomist (retired) AR, SEA, USDA, Pee Dee Experiment Station, Florence, SC 29503.

³Harrell, D. C., T. W. Culp, W. E. Vaught, and J. B. Blanton. 1974. Recent breeding progress in improving lint yield and fiber quality in PD lines of upland cotton (*Gossypium hirsutum* L.). South Carolina Agric. Exp. Stn. Tech. Bull. 1052.

⁴Culp, T. W. 1977. Recent genetic changes in the lint-yield fiber-strength association in cotton. Agron. Abstr. p. 53.

REGISTRATION OF PEE DEE 4461 COTTON GERMPLASM¹

(Reg. No. GP49)

T. W. Culp and D. C. Harrell²

THE unique breeding stock of cotton (*Gossypium hirsutum* L.), Pee Dee 4461 (GP 49), was released to plant breeders and geneticists by AR, SEA, USDA, and the South Carolina Agricultural Experiment Station in 1974. This breeding stock possesses extra fiber quality, is an excellent combiner for yield and fiber strength, and carries unidentified factors for resistance to *Heliothis* spp.

Pee Dee 4461 was developed in a complex backcrossing and composite-crossing (CC) program to transfer the high lint percentage of a *G. barbadense* L. strain to upland cotton (1). Other parental material involved was 'Earlistaple', 'Auburn 56', and 'Coker 100 Wilt'. Pee Dee 4461 was an unusual CCF₃ selection with light green plant color essentially devoid of red pigment, compact plant type, and unusual prolificacy of small bolls. It was tested under the experimental label Q₁.

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²Research agronomist and research agronomist (retired), AR, SEA, USDA, Pee Dee Experiment Station, Florence, SC 29503.

Although Pee Dee 4461 produces low lint yields and has unusually small bolls and seed compared with these traits in southeastern cultivars, the breeding stock has high lint percentage and excellent fiber properties. It combines well with many commercial cultivars and breeding lines (1) giving heterosis for lint yield of 15 to 20% over the superior parent and transmitting a 15% increase in fiber strength from *G. barbadense* to its progenies.

Pee Dee 4461 was the common parent in several crosses that produced progenies resistant to *Heliothis* spp. (2, 3). This source of resistance to *Heliothis* spp. has not been isolated or identified, but Pee Dee 4461 must possess resistant factors. Preliminary studies suggest that cultivars with insect resistance require less insecticide or fewer applications for *Heliothis* spp. control, which can make cotton a more profitable crop and give a cleaner environment in which to live. Seed (25 g) of this breeding line may be obtained from AR, SEA, USDA, Pee Dee Experiment Station, Florence, SC 29503.

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2. ———, H. M. Taft, and A. R. Hopkins. 1977. Reaction of several cultivars to cotton insects in South Carolina. Beltwide Cotton Prod. Res. Conf. Proc. Nat. Cotton Counc. p. 97 (Abstr.).
3. ———, ———, and ———. 1978. Response of cotton cultivars tolerant to *Heliothis* spp. under three insecticide regimes. Beltwide Cotton Prod. Res. Conf. Proc. Nat. Cotton Counc. p. 84. (Abstr.).

REGISTRATION OF PEE DEE 6520 GERMPLASM LINE OF COTTON¹

(Reg. No. GP50)

T. W. Culp and D. C. Harrell²

PEE DEE 6520 (GP 50), a very early maturing breeding stock of cotton (*Gossypium hirsutum* L.) with extra fiber strength, was released by AR, SEA, USDA and the South Carolina Agricultural Experiment Station in 1974. This breeding line represents a major improvement in lint yield and maintains a portion of the extra fiber strength of its parents.

Pee Dee 6520 was developed from a composite cross of two F_1 hybrids, (FTA 266 × 'Atlas') × (AC 235 × 'Dixie King'). FTA 266 was developed from a series of complex crosses involving Triple Hybrids 108 and 171, 'Earlistaple', 'Sealand 542', and AHA 6-1-4. AC 235 was derived from similar crosses that included C 6-5. Atlas, a commercial cultivar of Triple Hybrid origin, was developed at the Georgia Coastal Plain Experiment Station. Dixie King, a conventional southeastern commercial cultivar, was developed by the Bobshaw Pedigreed Seed Company, Stoneville, Miss. Pee Dee 6520 was derived from the increase of seed from a single F_3 plant selection.

Pee Dee 6520 produced yields comparable to 'Coker 201' at the Pee Dee Experiment Station and erratic yields in the 1968 and 1969 Regional High Quality Tests, primarily because its locks are too loose in the open bolls and fall out when harvest is delayed. This breeding stock is intermediate to Pee Dee 2165 and Coker 201 in fiber quality and yarn strength.

Pee Dee 6520 is early maturing and its compact plant type is advantageous when above-average plant populations are tested³. It also performs above average as an early season cotton in the Southeast.

Pee Dee 6520 has given above-average performances in tests where yields are influenced by injury from boll weevil (*Anthonomus grandis*).

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

³Culp, T. W., D. C. Harrell, and J. B. Pitner. 1974. Population studies with cotton (*Gossypium hirsutum* L.). South Carolina Agric. Exp. Stn. Bull. 575.