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References and Notes

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REGISTRATION OF FIVE AMERICAN PIMA COTTON GERMPLASM LINES

FIVE germplasm lines of American Pima cotton (*Gossypium barbadense* L.) (Reg. no. GP-255 to GP-259) were released by USDA-ARS and the Arizona Agricultural Experiment Station in 1985. These germplasm lines incorporate the genetic traits okra leaf, fertility restoration, frego bract, glandless, and nectariless into American Pima backgrounds. Each of these genetic traits has potential economic value. The germplasm lines could be especially useful in developing parental stocks for use in producing inter- or intra-specific cotton hybrids.

Pima okra leaf (Reg. no. GP-255) was selected in $BC1OF_2$ from a cross of 'Pima S-2' and Sea Island strain St. Vincent superfine okra leaf and backcrossed to 'Pima S-4'. Cotton with okra leaves mature earlier, have a more open canopy, are less susceptible to boll rot, and have shown resistance to boll weevil, *Anthonomus grandis* (Boheman), pink bollworm, *Pectinophora gossypiella* (Saunders), and banded-wing whitefly, *Trialeurodes abutilonea* (Haldeman) (3,6). Pima okra leaf, compared with 'Pima S-5' (1), has a lower lint percentage and lint index, shorter and weaker fiber, and similar boll size, seed size, and fiber fineness.

Pima restorer 4113 (Reg. no. GP-256) was selected in $BC4F_5$ from a cross of 71-176 and Pima S-4 followed by backcrossing to Pima S-4 for three generations and crossed to Pima S-5 for one generation. The 71-176 line was the source of *G. harknessii* Brandg. cytoplasm and restorer genes, and was developed by Vesta Meyer of the Mississippi Agricultural and Forestry Experiment Station, Stoneville (5). Pima restorer 4113 is true-breeding for fertility restoration of male-sterile plants with *G. harknessii* cytoplasm. Pima restorer 4113, compared with Pima S-5, has weaker and finer fiber, and similar boll size, seed size, lint percentage, lint index, and fiber length.

Pima frego bract (Reg. no. GP-257) was selected in $BC7F_2$ from a cross of a *G. hirsutum* × *G. barbadense* genetic stock that carried frego bracts and Pima S-2 followed by one backcross to Pima S-2, three backcrosses to Pima S-4, and three backcrosses to Pima S-5. Frego bract is a genetic trait that conditions resistance to the boll weevil (2). Pima frego bract, compared with Pima S-5, has a lower lint percentage and lint index, slightly weaker fiber, and similar boll size, seed size, fiber length, and fiber fineness.

Pima glandless (Reg. no. GP-258) was derived from a composite of three glandless $BC7F_3$ plants selected from a cross of the *G. hirsutum* strain Shafter 23-B (4) and Pima S-2 followed by six backcrosses to Pima S-2 and one cross to Pima S-4. Glandless cotton does not contain pigment glands and the seed is nearly free of gossypol, resulting in improved cottonseed oil and cottonseed meal (4). Pima glandless, compared with Pima S-5, has a lower lint percentage and lint index, slightly weaker and longer fiber, and similar boll size, seed size, and fiber fineness.

Pima nectariless (Reg. no. GP-259) was selected in $BC3F_3$ from a cross of Pima S-4 and Deltapine-16 nectariless followed by three backcrosses to Pima S-5. Nectariless cottons are resistant to several insect pests of cotton including *Lygus hesperus* L. and pink bollworm (6). Pima nectariless, compared with Pima S-5, has smaller boll and seed, lower lint index, shorter fiber, slightly lower lint percentage, slightly weaker fiber, and similar fiber fineness.

Seed (25 g) of these germplasm lines may be obtained from USDA-ARS, University of Arizona Cotton Research Center, 4207 E. Broadway, Phoenix, AZ 85040.

E. L. TURCOTTE AND CARL V. FEASTER (7)

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REGISTRATION OF SEVEN COTTON GERMPLASM LINES

SEVEN germplasm lines of cotton (*Gossypium hirsutum* L.) (Reg. no. GP-260 to GP-266) were released by USDA-ARS and the Arizona Agricultural Experiment Station in 1984. These germplasm lines carry all combinations of the mutant characters nectariless (N), $2(ne_1,ne_2)$, smoothleaf (S), Sm_2,Sm_2 and Okra leaf (L), L_2^o, L_2^o, in a genetic background designated AET-5. These lines were developed as sources of resistance to pink bollworm [*Pectinophora gossypiella* (Saunders)].

The AET-5 breeding line was developed by G.A. Niles, Texas Agricultural Experiment Station. The components of the pedigree of this stock, designated by Niles as (AET-5 × (45-108 × Br-2-10)-7-69), were reported by Wilson et al. (3). This line has consistently shown less damage, caused by pink bollworm, than commercial checks, and has been used as a resistant standard (2).

The AET-5N (Reg. no. GP-260), AET-5S (Reg. no. GP-261), and AET-5NS (Reg. no. GP-262) lines were derived from a cross of AET-5 × La 15213 in 1977, followed by four backcrosses to AET-5 and selection for the appropriate phenotypes in the F_2 through BC_4F_2 generation. La 15213 is a nectariless, smoothleaf cotton developed by J. E. Jones, Louisiana Agricultural Experiment Station, from a cross of North Carolina Smooth-2 × 'Stoneville 7A' nectariless. La 15213 is predominantly in a Stoneville 7A background.

The AET-5L (Reg. no. GP-263), AET-5NL (Reg. no. GP-264), AET-5SL (Reg. no. GP-265), and AET-5NSL (Reg. no. GP-266) lines were derived from a cross of AET-5 × La 21198 in 1977, followed by four backcrosses to AET-5 and selection for the appropriate phenotypes in the F_2 through BC_4F_2 generations. La 21198 has a complex pedigree but is predominantly in a Stoneville 7A background, according to its developer, J. E. Jones (personal

communication, 1976).

In 1982 and 1983 field tests in Arizona, the parent AET-5 and all seven variants had significantly less seed damage, caused by pink bollworm, than did a commercial cultivar, 'Deltapine 61' (Wilson and George, unpublished data). In addition, AET-5N, AET-5L, AET-5NL, and AET-5NSL had significantly less seed damage than AET-5 itself, also significantly less than a nectariless cultivar, Deltapine NSL. All the variants, except AET-5N, had significantly fewer "horseshoes" of cotton leafperforator [*Bucculatrix thurberiella* (Busck)] than did AET-5.

In earlier experiments, over three seasons, AET-5 yielded 75% as much lint as did Deltapine 61 in insecticide-treated plots, and 91% as much in untreated plots (1). In the 1982 and 1983 experiments (unsprayed plots), AET-5N, AET-5L, and AET-5NSL did not yield significantly less lint than AET-5, Deltapine 61, or Deltapine NSL, but AET-5NL, and the other smoothleaf variants produced less lint. The AET-5 stock and the seven variants had significantly higher lint percentage than did Deltapine 61. The AET-5SL line equalled Deltapine 61 in fiber length and exceeded it in fiber strength; all the others had shorter fiber and similar strength. The AET-5N, AET-5S, and AET-5NS lines, and AET-5 itself, had higher fiber elongation percentages than Deltapine 61, and all four combinations that carry S had higher micronaire than Deltapine 61.

Seed (25g) of these germplasm lines may be obtained from USDA-ARS, Western Cotton Research Laboratory, 4135 E. Broadway Rd., Phoenix, AZ 85040.

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REGISTRATION OF SNAP-COWPEA GERMPLASMS

FIVE vegetable (snap-type) cowpea [(*Vigna unguiculata* (L.) Walp.)] breeding lines, no. 750, 754, 779, 868, and 1552 (Reg. no. GP–54 through GP–58) were developed at the Indian Agricultural Research Institute, New Delhi, India, for resistance to bacterial-blight disease (caused by *Xanthomonas campestris* pv. *vignicola*) (3). They were bred for cultivation during the summer months (April through June) in northern India, where the environment is hot with long days, and to replace the blight susceptible snap-cowpea cultivar 'Pusa Dofasli' (1). All lines were photoinsensitive with early and synchronous flowering, and determinate growth habit in most field environments in India (3). No. 779, 868, and 1552 were tested in several locations in India beginning in 1980. No. 1552 had broad adaptation, high yields, and effective blight resistance and was released in India in 1983 (3). No. 779 also has been extensively tested in intercropping systems by the Division of Agronomy, Indian Agricultural Research Institute, New Delhi, and has been recommended for use by farmers in India (3). No. 750 and 754 were developed by backcrossing with 'Barsati Mutant' (1,3). These latter two lines have superior pod quality for snap-cowpea use, and are more bushy, erect, and determinate than the other lines.

These lines have good adaptation to the short, rainy season in Tanzania (East Africa), due to their ability to produce a final harvest of dry seed within 60 to 65 days. No. 868 was used extensively in a multiple-disease-resistant cowpea breeding program for Tanzania, and is one of the source of earliness in several newly developed disease-resistant breeding lines (2).

In 1982, these breeding lines were evaluated by the University of California, Riverside (UCR) for their heat tolerance, earliness, and suitability as snap cowpeas for kitchen gardens and "U-pick" operations in the USA. The UCR accession numbers are 193 (no. 750–1), 194 (no. 750–2), 204 (no. 779), 205 (no. 868), 206 (no. 1552), and 240 (no. 754); 750–1 and 750–2 are selections from 750 with differences in plant growth habit and earliness.

All proved to be photoinsensitive, nonviny, early, and with synchronous flowering in summer plantings at Riverside and Imperial Valley during 1982–1984. The lines were screened for heat tolerance in Imperial Valley in 1983 and 1984. Podding intensity (measured on a visual scale of 1 to 5, where 1 = none and 5 = many) was 4.5, 3.6, 3.6, 3.5, and 2.5 for 750–1, 750–2, 779, 1552, and 754, respectively, compared to 4.25 and 3.10 for heat tolerant checks Prima' and TVu 4552, and 1.0 for heat-sensitive cowpeas, such as 'California Blackeye no. 5'. In a performance trial at Riverside, during June to September in 1984, 750–1 flowered earliest [37 days after planting (DAP)], followed by 750–2 (40 DAP); 779, 1552, 754 (43 DAP); and 'Snapea' (47 DAP). Harvests were made twice per week over 45 days. Green pod yields varied between 25 to 28 T/ha for the snap-cowpea germplasms, whereas Snapea yielded only 13 T/ha. In the same experiment, a snapbean (*Phaseolus vulgaris)* cultivar, Contender, gave a green-pod yield of only 6.7 T/ha due to the hot weather and smog. These snap-cowpeas germplasms appear to be particularly useful for producing large yields of pods in environments where snapbeans produce small yields due to hot weather. Pods of the snap-cowpea germplasms were more tender (succulent) but lighter green than those of Snapea. At present, the viny, nonsynchronous flowering Snapea cultivar is used by the snap-cowpea freezing industry in the USA, but the crop is harvested by hand. Number 750–1 and 750–2 may be suitable for mechanical harvesting due to their bushy, nonviny growth habit and synchronous flowering and podding.

Seeds are small (132, 97, 140, 82, and 124 mg for 750–1,750–2, 779, 868, and 1552, respectively), ovoid to kidney-shaped and black with white patches in 750–1 and 750–2, and cream with brown speckles and a brown eye in 779, 868, and 1552.

Small samples of seeds will be provided for research purposes upon written request to Professor A. E. Hall, Department of Botany and Plant Sciences, University of California, Riverside, CA 92521.

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