source of the germplasm if used in development of a new germplasm, parental line, cultivar, or hybrid.

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References and Notes

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Registration of Six Upland-Type Parental R-Lines for Hybrid Cotton

SIX UPLAND COTTON (Gossypium hirsutum L.) type restorer (R) lines were released by the New Mexico Agricultural Experiment Station in 1992. These advanced parental lines have been tested in a limited number of crossed combinations, some of which were equal to or better in yield than the best check cultivars available: Acala 1517-7S, Acala 1517-88, Paymaster 145, Paymaster HS-26 and the G. hirsutum × G. barbadense L. interspecific hybrid NX-1. One of the releases, BHLF-87049 (Reg. no. PL-1, P1566947), is a pure line. The other five are germplasms varying in uniformity, as follows: IV4F-91057 (Reg. no. PL-1-2, P1566946), PANF-88508 (Reg. no. PL-3, P1566945), HPNHF-90013 (Reg. no. PL-4, P1566944), IBMF-89063, Reg. no. PL-5, P1566943), and ASAF-88505 (Reg. no. PL-6), P1566942).

Restorer line BHLF-87049 was selected from the backcross family ‘Dixie King’ R-Line 11-A/* ‘Bobshaw Hi-linter’. The original Dixie King R-Line, obtained from J.B. Weaver, Georgia Agricultural Experiment Station, was reselected to obtain Dixie King R-Line 11-A, which served as the fertile donor parent for BHLF. The first cross of 11-A/BHL was made in 1983, and the selections resulting in BHLF came from progeny row h15653, a BC2 selection from this cross which was grown in 1985. Successive improvements have resulted from continuous selection since that time. The BHLF-87049 line has excellent combining ability for yield and gin turnout.

BHLF is a Deltatype upland cotton phenotype of medium height. The plants show prolific fruit set in mid-season. Bolls are of medium size, and lint percentage averages 41% at Las Cruces. Fiber is shorter and weaker than in the present commercial Delta cultivars. Yield of the average BHLF hybrid has been similar to the yields of the check cultivars. Location × year interactions with specific BHLF hybrid combinations indicate that superior hybrids can be identified for certain regions.

BHLF hybrids have performed better at Las Cruces than at Clovis or Tucumcari, NM, or at Labbock, TX, where the seasons are cooler and shorter. It may be adapted to the Mississippi Delta, the Southeast, or central Texas, because it is more tolerant to high night temperatures than are Acala 1517 cultivars. BHLF-87049 hybrids will normally be mid-season in maturity, and only hybrids from very early female parents would be useful in the High Plains. Also, hybrids equal to ‘Deltapine 50’ and Paymaster HS-26 in fiber quality will require female parents that have Acala fiber properties. Pollen fertility ratings, taken at Mariposa, AZ, in 1990 and 1991, indicate that F1 hybrids from this line had the highest fertility of any upland hybrids tested and were almost equal to interspecific hybrids in this respect.

The IV4F-91057 R-Line is from family IV4, a species introgression line, a 25th generation selection from the cross of Early Yugoslav upland with the G. barbadense L. line, Pima 1-71, made in 1967 by C.F. Chew, USDA-ARS, Las Cruces. Although upland in appearance, it carries some traits inherited from its Pima parent including semi-naked seed. The R-Line plant is short-statured, narrow, and early in maturity. It has produced hybrids that compete with Paymaster 145 in the northern High Plains, or in late planting situations where earliness is at a premium. The parental line transmits good fertility and heterosis for yield and earliness to its progeny. Its hybrids have some tolerance to drought and low temperature stress. Although not stormproof, IV4F lines have better storm resistance than standard Acala cultivars. Fiber strength and maturity are acceptable, but staple length tends to be short. However, when Acala parents were used as the female, the hybrid had fiber equivalent to that of ‘Deltapine 90’. F1 hybrids of IV4F with the ‘Acala 1517-77’ (A77C) female have been excellent High Plains types except for gin turnout. In limited testing, F1 hybrids with the concurrently registered SSEC female have been outstanding on the northern High Plains. This R-line could be interplanted (5–10% R-Line plants) in the rows of fuzzy seeded cytoplasmic male sterile plants. After harvest, fuzzy seeded F1’s could be separated by repeated passes insslotted shaker cleaners from the semi-slick seed produced by the R-Line.

The PANF-88508 R-Line descended from a cross made prior to 1970 of Pima nectariless/G. barbadense cv. Ashmouni. The Pima nectariless parent was obtained from the De Kalb germplasm dispersal, but appeared to have a primarily upland cotton phenotype. PANF-90032 is short to medium stunted, intermediate between the plains and delta plant types, midseason in maturity, and transmits good yield and fiber properties, good fertility, and good stress resistance. However, the line needs further selection for trueness to modal type. The F1 hybrid with the SSEC female has been outstanding in six dryland tests on the High Plains from 1989–1991.

The HPNHF-90013 R-Line resembles upland cotton most closely, but has a high proportion of introgression from G. barbadense. This line was developed over a 15-yr period from a very complex series of interspecies crosses. It is still segregating for fertility restoration, but the fertile segregants in the population are very high level of fertility to their F1 hybrids. Certain segregants also have high levels of fiber strength. Variability for yield, earliness, and gin turnout can be derived from this germplasm. In 1991, the only HPNHF hybrid placed in a yield test was very early and productive, had good fiber properties in the range of those of Deltapine 90, but was moderately susceptible to verticillum wilt, caused by Verticillium dahliae Kiehl., indicating a need for mating this line to female parents possessing good wilt tolerance.

The IBMF-89063 R-Line is a stable parental line of unknown potential. It is offered to breeders because of its unique ancestry, which is primarily G. barbadense × G. hirsutum var. marie-galante (Watt) J.B. Hutch. It is still segregating for fertility and other traits. A small sampling of F1 hybrids has shown that performance of this line tested in New Mexico has been about average for most traits. The ASAF-88505 R-Line comes from an R-line family of relatively recent origin whose potential has not been explored fully and which needs improvement through further reselection. It was developed out of the cross ‘Acala 1517 BR-2’ sib/‘Stoneville 213’/‘Acala 1517 BR-2’ sib. This line has an early, compact plant type that may be useful in High Plains hybrids, contributing yield, earliness, and good fiber properties. The fiber properties generally fall in the range of Paymaster 15 F1 hybrids. Gin turnout is medium high.

Seed of these releases and representative testcross hybrids