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REGISTRATION OF HYC79-6 COTTON GERMPLASM

HYC79-6 (REG. NO. GP247) was released as a germplasm line of upland cotton (*Gossypium hirsutum* L.) by the Missouri Agricultural Experiment Station in 1983.

HYC79-6 is an F_8 line with a sub okra-like leaf that was developed from a series of crosses among short-season, early-maturing, and prolific-fruiting parents. The original plant with the sub okra-like leaf was selected in F_5 from a complex interspecific population composed of 'Sea Island Seabrook' and 'Pima S-2', both *G. barbadense* L., and four *G. hirsutum* L. sources of diverse origin. At least one upland source was derived from a tri-species background involving *G. hirsutum*, *G. arboreum* L. and *G. thurberi* Tod. This leaf shape was later recognized as similar to that of sub okra (L^u_2) (1).

HYC79-6 is a short-statured, prolific-fruiting, early-maturing plant with a moderately stiff stalk and average storm resistance. It is resistant to bacterial blight, caused by *Xanthomonas malvacearum* (E. F. Sm.) Dows, races 1, 2, 7, 10, 11, and 12. It possesses a low level of resistance to Verticillium wilt, *Verticillium dahliae* Kleb, and to the Fusarium wilt-root knot nematode complex, caused by *Fusarium oxysporum* Schlect. f. *vasinfectum* (Atk.) Synd. and Hans and *Meloidogyne incognita* (Kofoid and White) Chitwood.

HYC79-6 produced approximately 90% of the yield of commercial cultivars when grown at Portageville, Mo. Plants usually are dwarfed by soil or moisture stress and adaptation may be narrow.

The lint fraction of HYC79-6 is slightly less than that of 'Stoneville 825' and 'Delcot 311', and boll and seed size are similar to that of Delcot 311. Its fiber is shorter, coarser, and weaker than that of Stoneville 825 and Delcot 311.

HYC79-6 provides germplasm with the sub okra-like leaf, bacterial blight resistance, and early maturity. Sub okra-like leaves are produced as flowering begins. Earlier leaves are near normal providing the young plant with a more favorable growth potential for closing the canopy. Older leaves have narrowed lobes and deeper cut laciniae which permit greater light penetration and aeration of maturing bolls.

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References and Notes

1. Green, J.M. 1953. Sub okra, a new leaf shape in upland cotton. J. Hered. 44(6):229–232.
2. Professor, Dep. of Agronomy, Univ. of Missouri College of Agric. and Agric. Exp. Stn., Delta Ctr., Portageville, MO 63873. Registration by the Crop Sci. Soc. of Am. Published with approval of the Director of the Missouri Agric. Exp. Stn. as Journal Article no. 9509. Accepted 2 Feb. 1984.

REGISTRATION OF HIGH STEARIC ACID MAIZE GE180 GERMPLASM

THE MAIZE (*Zea mays* L.) inbred GE180 (Reg. no. GP129) was developed at the Georgia Agricultural Experiment Station in a breeding program to develop lines with unique fatty acid composition of the kernel germ oil. The original germplasm for this line was PI 175334 (Nepal cultivar 'Tusa Rani'), which had a mixture of flint- and dent-type kernels of white, red, and purple color. Individual kernels of the original germplasm source ranged from 1.5 to 6.3% stearic acid composition of the germ oil. Selfing of the Plant Introduction seed produced ears which had kernels containing germ oil ranging from 2.8 to 11.5% stearic acid. An ear-to-row breeding procedure of selfing for eight generations with visual selection for grain quality has produced a relatively uniform plant type. A number of sister inbred lines were grown in 1982 from which 250 selfed ears were obtained and analyzed for fatty acid composition. Stearic acid composition of oil ranged between 13.0 and 19.8% for 240 ears and below 13.0% stearic acid for 10 ears. GE180 was derived by combining the seed from 34 selfed ears which had germ oil composition of 18 to 19% stearic acid. It is expected that additional selfing and selection within GE180 could produce ears with less than 18% or greater than 19% stearic acid. However, future seed maintenance for GE180 will be done in conjunction with oil analyses so that only ears with a range of 18 to 19% stearic acid composition of germ oil are saved for continuing the line.

Stearic acid is a saturated fatty acid with an ^{18}C chain and makes up about 2% of the total fatty acids in commercial maize oil (1). The discovery of high stearic acid was first reported in 1970 (3). GE180 is unique in having about an 8 to 9 fold higher composition of stearic acid in the oil as compared to most other maize germplasm and to commercial oil (18.3 vs. 2.2%). The fatty acid composition of GE180 also differs from commercial oil with higher (13.8 vs. 11.5%) palmitic acid and lower (38.2 vs. 58.7%) linoleic acid. The much lower composition of linoleic acid of GE180 is not unusual for a diverse array of maize genotypes. Oleic acid (26.8 vs. 26.6%) and linolenic acid (0.9 vs 0.8%) of GE180 is similar to commercial oil composition. Arachidic acid is found only in trace amounts (0.1 to 0.3) in commercial maize oil, but makes up 2% of the oil in GE180. The phenomenon of high arachidic acid composition associated with high stearic acid is similar to that found for a high stearic acid line of soybean [*Glycine max* (L.) Merr.] (2).

GE180 has the highest level of stearic acid in the germ oil that has been reported for maize. It was released as a genetic source for studies involving fatty acid inheritance, oil quality and composition, and oil physiology and biochemistry. Inheritance of stearic acid composition was previously reported (4) for related lines used during the development of GE180. These lines had oil with about 10% stearic acid and the inheritance of high stearic acid was attributed to a single major recessive gene. Transgressive segregation for high stearic acid indicated the presence of modifying genes. The inheritance of stearic acid in GE180 has not been studied, but based on previous work (4), it is expected that the inheritance pattern would be relatively simple.

GE180 averages 165 cm in plant height with ears about 65 cm above ground level. Tassels are of medium size, and widely branched with 12 to 15 branches. The plant has about 11 narrow leaves at maturity. The plant will silk in about 65 to 70 days after planting and the ear shoot is characterized with long husks that generally require trimming back to obtain easy hand-pollinations. GE180 has a white, semi-flint type grain on a white cob.

Seed of GE180 will be maintained by the Georgia Agric. Exp. Station. Germplasm seed samples are available from the Dep. of Agronomy, Georgia Exp. Stn., Experiment, GA 30212.

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References and Notes

1. Beadle, J.B., D.E. Just, R.E. Morgan, and R.A. Reiners. 1965. Composition of corn oil. J.Am. Oil Chem. Soc. 42:90–95.