REGISTRATIONS OF GERMPLASM

Registration of High Fiber Strength Cotton Germplasm Line NM970513

NM970513 (Reg. no. GP-714, PI 613344) upland acala cotton (Gossypium hirsutum L.) germplasm line was developed by the New Mexico Agricultural Experiment Station and released in 2000. NM970513 will provide plant breeders a new source of genes for fiber strength. NM970513 was selected from the cross ‘Acala 1517-95’/NM24052 made in 1994 at the New Mexico Agricultural Experiment Station at Las Cruces, NM. Acala 1517-95 is a high quality acala cultivar with the pedigree Acala 3080/PD2165 (Cantrell and Escabedo, 1997). NM24052 is an experimental line derived from the cross St9/Del Cerro. Del Cerro is a complex population released in 1957 and contains introgression from G. hirsutum L., G. hirsutum var. punctatum (Schumach & Thonn.), G. barbadense L., G. herbaceum L., and G. thurberi Tod. (Smith et al., 1999; Staten, 1971). St9 is a striper experimental line contributing earliness and compact growth habit to the cross.

In 1995, 122 F1 plants from the cross Acala 1517-95/NM24052 were selfed in Las Cruces, NM, to produce F2, progeny. These progeny were evaluated in replicated trials at Las Cruces and Artesia, NM, in 1996. Extensive transgressive segregation was observed in this population for fiber strength (Cantrell et al., 1995). All F1, lines were grown also in 10-m rows in the genetics nursery at Las Cruces for selfing. Five random plants within each progeny row were selected to generate F3, progeny. Five F3, lines that were selected on the basis of their 1996 fiber bundle strength in the replicated trials were grown in the 1997 Las Cruces genetics nursery. Fifty bolls were bulk harvested from each F3, progeny row for fiber quality determination. The best 25% of the F3, progeny rows were selected based on fiber strength and tolerance to Verticillium wilt (caused by Verticillium dahliae Kleb.), Five plants within each selected row were selfed to derive F4, progeny. Open-pollinated seed (F4,5) were also bulk harvested from each selected progeny row for 1998 replicated yield trials. NM970513 originated as a bulk of seed from a single F4,5 progeny row grown in 1998. Bulked F4,6 seeds were grown for multiplication and increase in 1999.

The yarn tenacity for 22-count yarn averaged 175.8 kN m kg⁻¹ for NM970513 and 130.3 kN m kg⁻¹ for Acala 1517-95. Fiber samples were submitted to the Texas Tech University International Textile Center for fineness and maturity testing. The maturity ratio is the ratio of fibers with a 0.50 (or greater) circularity ratio divided by the number of fibers with a 0.25 (or less) circularity. The mean maturity ratio of NM970513 was 0.93 and 0.86 for Acala 1517-95. The immature fiber content of NM970513 was 8.5% compared with 11.1% for Acala 1517-95. The mean fiber fineness was 144 m g⁻¹ for NM970513 and 130.3 m g⁻¹ for Acala 1517-95. This germplasm line had large seed with a seed index of 0.93 and 0.86 for Acala 1517-95. The immature fiber content of NM970513 was 8.5% compared with 11.1% for Acala 1517-95. The handpicked lint percentage averaged 38.3 for NM970513 and 40.8 for Acala 1517-95. NM970513 has large seed with a seed index of 38.3 for NM970513 and 40.8 for Acala 1517-95. The average lint yield of NM970513 averaged over six trials in New Mexico was less (P ≤ 0.05) than Acala 1517-95 (1224 vs. 1412 kg ha⁻¹). The handpicked lint percentages averaged 38.3 for NM970513 and 40.8 for Acala 1517-95.

Small amounts of seed of NM970513 will be provided on written request to the corresponding author. Recipients are asked to make appropriate recognition of the source of germplasm if used for research purposes, or for development of a parental line, cultivar, or hybrid.

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References