BREEDING FOR RESISTANCE TO VERTICILLIUM WILT AND ROOT-KNOT NEMATODE IN CALIFORNIA ACALAS

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Abstract

Breeders at the U.S.D.A. Cotton Research Station, Shafter, CA began improving the verticillium wilt resistance of California Acalas during the 1930's. In the 1960's John H. Turner made significant improvements with his Acala 1-2302 germplasm from which was derived Acalas SJ-1 and SJ-2, while H.B. Cooper, Jr. developed the wilt resistant Acalas SJ-3, SJ-4 and SJ-5 in the 1970's. When cotton breeding at the Shafter U.S.D.A. station ceased in 1978 this effort was continued by private companies. In 1984 C. Harvey Campbell, Jr. released Germain's GC-510 which was widely planted on verticillium wilt infested San Joaquin Valley (SJV) soils, while SJ-2 remained popular for non-wilt ground. During the late 1980's Acalas SJ-2 and GC-510 each accounted for about half of the SJV cotton acreage. Few verticillium wilt resistant SJV Acalas have gained more acceptance than Acala Maxxa. Since its release in 1990 Acala Maxxa has been planted on as much as 90% of the SJV cotton acreage because of its excellent yield performance on both wilt and non-wilt infested soils. Improvement of verticillium wilt resistance in SJV cotton remains an important research objective for SJV cotton breeders as evidenced by the recently released varieties California Planting Cotton Seed Distributor's (CPCSD) Acala GTO, Delta Pine Acala 6204, Phytogen 33 Acala, and Germain's GC-500.

In 1995 CPCSD released Acala NemX because of its ability to yield under high levels of field root-knot nematode infestation (Meloidogyne incognita). Acala NemX was developed using a selection from N6072, a line released by Angus Hyer while at the U.S.D.A. Shafter Station. Dr. Hyer produced N6072, and several other nematode tolerant lines, by crossing Turner's Acala 1-2302 with Tanguis. Other experimental lines are currently in development at CPCSD that show increased tolerance to root-knot nematodes.

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