

THREE ROOT-KNOT NEMATODE RESISTANT GERMPLASM LINES OF UPLAND COTTON

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Three nematode resistant germplasm lines of upland cotton, *Gossypium hirsutum* L., designated as TAM 2561 RKNR, TAM 2562 RKNR, and TAM 2571 RKNR were released by the Texas Agricultural Experiment Station in 1995. These lines were developed as part of a breeding program designed to provide resistance to biotic and abiotic stresses affecting cotton in Texas. These lines were derived by hybridization of two root-knot nematode, *Meloidogyne incognita* (Kofoid and White) Chitwood, resistant breeding lines and 86T²-12, an unreleased breeding line that has >Deltapine 14', Paymaster 1209, and PD 6992 (2), plus other breeding stocks in its pedigree. The root-knot nematode resistant parents, M-240 RNR and M-725 RNR, were released by Shepherd et al. in 1989 (4). Line M-240 RNR was derived by backcrossing Auburn 634 RNR (3) as the non-recurring parent to >Deltapine 61' while M-725 RNR was derived by backcrossing Auburn 634 RNR as the non-recurring parent to >Coker 310.= Line M-240 RNR was used in developing TAM 2561 RKNR and TAM 2562 RKNR while M-725 RNR was used in developing TAM 2571 RKNR. TAM 2561 RKNR is a composite of two sib lines displaying similar fiber properties, yield potential, and root-knot nematode resistance. Individual F₂ plants were screened under greenhouse culture in the presence of root-knot nematodes during the winter of 1991. Resulting progeny were grown in were grown at the Texas A&M Research Farm at College Station, TX during the summer of 1992. Rows exhibiting phenotypic uniformity and apparent agronomic potential were selected for further evaluation.

Yields of TAM 2561 RKNR, TAM 2562 RKNR, and TAM 2571 RKNR were not different in 1993 or 1994 than >Paymaster HS-26', a popular cultivar adapted to the High Plains of Texas where root-knot nematodes are known to be widely distributed. TAM 2561 RKNR and TAM 2562 RKNR had slightly shorter upper half mean length of fibers than Paymaster HS-26 when grown at College Station in 1994. All other fiber characteristics were equal to or better than Paymaster HS-26. All three germplasm lines had fewer root galls, indicative of resistance, than >Rowden= (1), the susceptible control, when grown in the National Fusarium Wilt/Cotton Variety test at Tallassee, AL and when grown in a field infested with root-knot nematodes at Seminole, TX. The susceptible control at Seminole was Paymaster HS-26. Final root-knot nematode counts (500 cm³ soil)⁻¹ TAM 2561 RKNR, TAM 2562 RKNR, TAM

2571 RKNR, and Rowden were 42, 30, 1 and 1399, respectively, when grown under greenhouse culture at College Station in 1993. Mid-season nematode populations at Seminole in 1994 were 83, 1004, 130, and 15 928 for TAM 2561 RKNR, TAM 2562 RKNR, TAM 2571 RKNR, and Paymaster HS-26, respectively.

Reselection within these lines for resistance to the root-knot nematode could result in the development of lines with high levels of resistance to the pest. These lines will provide the developers of cultivars for the Texas High Plains with germplasm having a high level of resistance and excellent yield potential.

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References and Notes

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