

GENETICS OF RESISTANCE TO ROOT-KNOT NEMATODES IN SOME COTTON CULTIVARS

E. Zhou, J. L. Starr and C. W. Smith

Texas A&M University

College Station, TX

Abstract

Acala NemX and Stoneville LA887 are two recently released cotton cultivars with resistance to the root-knot nematode *Meloidogyne incognita*. No data are available concerning the inheritance of resistance in these cultivars or whether the resistance of each cultivar is due to unique genes. To determine the inheritance of resistance, each cultivar was crossed with the susceptible cultivar DeltaPine 90, and NemX was crossed also with LA 887. F1 and F2 individuals from each cross were scored for resistance based on nematode reproduction measured as eggs per gram of roots and root gall indices. In both DP90 \times NemX and DP 90 \times LA 887, ca 20% of the F1 individuals were resistant and the remainder were susceptible. The F2 from susceptible F1 segregated in a ratio of 1 resistant: 3 susceptible for both crosses, indicating that resistance in these individuals was inherited as a single recessive gene. Resistance segregated in a ratio of 7 resistant: 9 susceptible for the F2 from the resistant F1 of the DP 90 \times NemX cross, suggesting that resistance in these individuals was inherited as two complementary dominant genes. Resistance segregated in a ratio of 15 resistant :1 susceptible in the F2 from resistant F1 of the DP 90 \times LA 887 cross, suggesting that in this case resistance was inherited as two dominant genes. All of the F1 and F2 individuals from the NemX \times La 887 cross were resistant, suggesting that resistance of these two cultivars may be due to the same recessive resistance gene. Recent studies have revealed that variation exists with respect to aggressiveness of nematode populations on these resistant cultivars. This situation will require development gene deployment systems that minimize the potential for selection of aggressive nematode populations. The development of gene deployment systems to enhance the durability of this resistance will be dependent upon rotating different resistance genes. Thus it is important that the identity of the resistance genes in these cultivars and other resistant breeding lines be determined.