

**VARIABILITY OF PLUS AND MINUS GOSSYPOL
IN THE 1998 NATIONAL COTTON VARIETY TEST**

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Abstract

Gossypol's toxic properties in cotton seed (*Gossypium* spp.) have been a deterrent to its use as a feed to animals. Gossypol consists of two optical isomers, designated "plus" and "minus". The minus isomer is the more biologically active of the two isomers. The National Cotton Variety Test determines gossypol, but previously has not explored the genetic variability for plus and minus gossypol. The objective of this study was to sample the National Cotton Variety Test to determine if sufficient genetic variability exists within current varieties to warrant further investigation. The Regional High Quality (RHQ) study was selected as it has historically showed much genetic variability for many traits. Two of its 1998 locations, Stoneville, MS and College Station, TX were chosen as sites to evaluate 20 varieties. At three locations of the National Pima Variety Tests, three varieties' seed was also evaluated. Location difference for total gossypol (plus + minus), plus, and minus were large. However, the RHQ variety variance component was large. The percent of total, plus, and minus gossypol accounted for by the variety effect was 61, 72, and 53%, respectively. The variety X location component accounted for 9, 6, and 12 %, respectively, of the total variance components. Of major interest was the minus percent of total gossypol. Its variety component was 92% and its interaction component was 3% of the total variance components. These results show large amounts of genetic variation for plus and minus gossypol within Upland varieties and advanced breeding lines. The small sample of Pima varieties showed a similar trend with large differences among three varieties. The minus content of Pima cotton is high.