

## **Diallel analysis on variation of Verticillium wilt resistance in upland cotton grown in Zimbabwe**

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### **Abstract**

Verticillium wilt disease causes significant losses to cotton yield and varietal development for resistance is critical in combating this threat. A study was carried out to determine the underlying genetic pattern controlling disease resistance and identify suitable parental lines to use in varietal tolerance development. Five cotton varieties were crossed in a half diallel mating system to produce ten crosses and five selfed parental lines which were screened against Verticillium wilt by artificial inoculation. There were significant variations on the severity scores, vascular brown index scores, morphological and agronomical traits under Verticillium wilt pressure. The Verticillium wilt severity scores ranged from 1.22 to 3.07 and Vascular Brown Index scores from 0.78 to 2.77. The mean squares of general combining ability (GCA) for the various characteristics of the parents were significant and also for the specific combining ability (SCA) of the vascular brown index score which was 0.27 was also significant. Three parental lines were identified as breeding material with good GCA, morphological and agronomical performance and these were CRI-MS-1, SZ9314 and BC853. This study implies that varietal tolerance can be developed by incorporating genotypes with resistance genes in breeding programmes. Future work should focus on developing resistant varieties suitable for production in Verticillium wilt prone areas.