

Characterisation of upland cotton grown in Zimbabwe using agronomical and morphological markers for Verticillium wilt tolerance

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Abstract:

Accurate morphological characterisation of plants is used for selecting the best performing varieties. The morphological markers can be visualised without molecular techniques making it the easiest way of identifying variation within varieties. Characterisation of Verticillium wilt tolerant lines in cotton variety is important in understanding the underlying genetic control of Verticillium wilt tolerance. Five local varieties with varying tolerance to the disease and different yield potentials were crossed in a half diallel mating design in 2013. The ten crosses and five parental lines that were produced by the mating system were subjected to Verticillium wilt by artificial inoculation in 2013/14. These cotton lines were characterised using agronomic and morphological markers to identify Verticillium wilt resistance. Screening for Verticillium wilt resistance was done to identify morphological and agronomical markers which were used to group similar lines through cluster analysis. Three parental lines were identified with good morphological and agronomical performance that could be used in Verticillium wilt resistance breeding. These were CRI-MS-1, SZ9314 and BC853 which produced superior offspring in the diallel mating system. Furthermore, qualitative morphological traits and the agro-nomical traits were used as markers for selection of Verticillium wilt resistance cotton germplasm.