

QUANTIFICATION OF FOV4 IN SOILS WITH SUSCEPTIBLE OR TOLERANT COTTON CULTIVARS

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Abstract

Fusarium oxysporum f. sp. *vasinfectum* race 4 (FOV4) adversely impacts cotton production causing plant wilt and death. With FOV4 in proximity to the largest Upland cotton producing region in the U.S. – the Southern High Plains of West Texas, the need for developing effective detection protocols is urgent. Twelve cultivars and germplasm including Pima and Upland types with known reactions to FOV4 infection were grown in an FOV4-infested field in El Paso County, TX in 2020. To evaluate plant survival and root vascular infection, stand counts were recorded at 20 and 55 days after planting (DAP), along with visual ratings of root necrosis at 55 and 162 DAP. Significant differences were observed for all field data among genotypes. Additionally, soil samples were collected at planting (0 DAP), 55 DAP, and 143 DAP for DNA extraction and quantification of FOV4 using qPCR. Differences were observed among genotypes for soil FOV4 quantity at 55 and 143 DAP, with known susceptible cultivars having greater quantities of FOV4 present in the soil. While FOV4 quantity did not decrease in the presence of resistant cultivars in the first year of this study, planting of resistant cultivars did prevent the exponential increase of FOV4 in the soil during the growing season. This is the first report in which genotype FOV4 infection response and FOV4 soil inoculum quantity has indicated that host-plant resistance is effective to manage FOV4.