## STUDY OF FUSARIUM WILT IN COTTON, NEW FINDINGS IN THE MANAGEMENT FRONT Cecilia Monclova-Santana Texas A&M AgriLife Extension Service Lubbock, Texas Terry A. Wheeler Texas A&M AgriLife Research

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## <u>Abstract</u>

Fusarium wilt, caused by Fusarium oxysporum f. sp. vasinfectum (FOV) has many races with different variety responses. In the Southern High Plains of West Texas, FOV race 1 and 2 has been found causing wilting and stunting symptoms in the presence of the root knot nematode (RKN) Meloidogyne incognita. In addition, FOV race 4 has been reported in El Paso and Hudspeth Counties since 2017 affecting Pima cotton. Successful management of Fusarium wilt has been linked to the use of resistant varieties. However, resistant cultivars to the FOV race1 or 2+RKN disease complex have not been well defined. At one time it was assumed that if a cultivar had resistance to root-knot nematode, then it also had resistance to FOV race 1 or 2. However, that assumption was disproved by producers in the Southern High Plains, who experienced complete cotton failure due to Fusarium wilt during 2015-2017, following the introduction of some new root-knot nematode resistant cultivars. This project explores variety responses to FOV1 and RKN in Hall County, and FOV4 in El Paso County. In 2021, a trial was stablished in Hall County evaluating 24 different varieties in a naturally infested field with root-knot nematode and FOV1. The highest yielding variety was PHY 411 W3FE with 2,392 lint lbs./A, this is considered a highly resistant variety to root knot (and reniform) nematode. Likewise, PHY 411 W3FE also resulted in low nematode counts and low egg counts. These are significantly different from the susceptible DP 1646 B2XF that yielded 2,066 lint lbs./A and resulted in a significantly higher nematode and egg counts. The use of resistant varieties is still the recommended management strategy, however, in 2021 there were reports of stand losses of 5-10% while using a resistant variety in an infected field. A FOV4 trial was planted in El Paso County using 12 Pima and Upland cultivars with diverse FOV4 responses. FOV4 quantity was performed using the QS3 platform and amplified using the primer Tfo on PHO gene developed by Davis and Chappell (2019). Overall, Upland varieties are able to survive and yield under FOV4 inoculum pressure. However, susceptible Upland varieties increase the inoculum density, while resistant Upland can reduce the increment of FOV4 inoculum. Susceptible Pima varieties are highly affected by FOV4, reporting up to 60% stand loss in the first 21 days after planting. At the end of the season, susceptible Pima cultivars had up to 100% stand losses in some plots. Variety selection remains the best management strategy to control Fusarium wilt in cotton.

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