

**FUSARIUM IN THE SAN JOAQUIN VALLEY OF CALIFORNIA:  
IMPACT OF COTTON TYPE AND VARIETY**

**R.B. Hutmacher, M.P. Keeley, and R. Delgado**

**Univ. CA Shafter Res. Ctr.**

**Shafter, CA**

**M.R. Davis and Y. Kim**

**Univ. CA Davis Plant Pathology Dept. and Coop. Ext.**

**Davis, CA**

**D.S. Munk**

**Univ. CA Coop. Ext.**

**Fresno, CA**

**S.D. Wright**

**Univ. CA Coop. Ext.**

**Tulare, CA**

**B.A. Roberts**

**Univ. CA Coop. Ext.**

**Hanford, CA**

**M. Ulloa**

**USDA-ARS**

**Shafter, CA**

**R. Percy**

**USDA-ARS**

**Maricopa, AZ**

Most cotton crop loss in the San Joaquin Valley associated with the wilt disease caused by the fungus *Fusarium* (*Fusarium oxysporum* f.sp. *vasinfectum*) (FOV) has typically been found to be closely associated with fields where it can be ascertained that there is also significant nematode damage from root knot nematode. However, some recent field investigations in this area have found *Fusarium* symptoms in clay loam and loam soils in which root knot nematode populations and root damage from nematodes were extremely low. Numerous fields have been surveyed in 2002 and 2003 to look for field foliar symptoms of *Fusarium* wilt both at fields identified by growers or consultants, as well as in fields selected by University of CA staff based on prior history of *Fusarium*, soil type, prior problems with nematodes or newly identified locations where cotton exhibited symptoms of foliar and root damage consistent with a wilt disease. This field project is closely tied in with an ongoing laboratory project (with Dr. Michael Davis from University of CA Davis as lead investigator) which has developed genetic tools to evaluate differences across *Fusarium* strains in CA and compare them with Australian strains. Some of this work was reported in the proceedings of the 2003 Beltwide Cotton Conferences. Significant findings arising from these two associated projects to date include: (1) none of the sampled fields (to date) were found to be infected with either of the two highly virulent Australian strains of *Fusarium* currently under investigation in Australia; (2) a wide range of strains have been identified across different soil types and production regions within the San Joaquin Valley; (3) some of these strains are much more virulent to a limited range of Pima varieties than on tested Acala varieties evaluated for relative susceptibility, and (4) a FOV strain isolated from California field plant and soil samples at two isolated San Joaquin Valley locations has been identified as race 4 FOV. The Race 4 FOV, in greenhouse studies and two field sites, has been observed to cause significant foliar disease symptoms and stunting even without nematode populations and root damage. Stunting and foliar damage evaluated to date has been significantly more severe in commercial and experimental Pima varieties than in the limited Acala and Upland varieties evaluated at this time. This information does not necessarily indicate the presence of newly introduced virulent strains but rather that certain Pima varieties may be more susceptible to this race 4 strain which has been identified in the San Joaquin Valley. In a grower field with confirmed race 4 FOV, a preliminary screening effort was set up with 50 entries consisting of commercially-available Acala, Pima, and non-Acala Uplands, an interspecific Pima/Upland hybrid, and a selection of experimental Pima and Upland varieties from seed company and USDA collections. Field evaluations of these varieties planted into a field known to have prior plant damage attributed to FOV race 4 indicated that most Pima varieties evaluated showed more severe development of foliar symptoms, root vascular damage and stunting, but also indicated that a wide range of Acala and non-Acala Upland varieties could be infected, albeit with much less stunting and likely impact on yields. Work will continue in field sampling and follow-up evaluations in 2004.