FUSARIUM RACE 4: COMMERCIAL CULTIVAR SCREENING FOR RESISTANCE

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Abstract

Fusarium wilt (FOV) of cotton in California has been considered a potentially serious fungal disease for many decades in areas of the San Joaquin Valley (SJV). In the past, damage from Fusarium has been notable only in areas with the combination of: (a) moderate to high populations of one or more specific races of FOV (usually race 1); (b) soils with a coarse texture; and (c) where root knot nematodes existed in populations adequate to cause significant root damage. While most cotton crop loss in the SJV from Fusarium wilt likely remains associated with nematode damage and race 1 FOV, field investigations recently have found Fusarium symptoms across a range of soil textures in which root knot nematode populations were very low. This more-recently identified FOV identified in these studies has been identified as race 4. Field and greenhouse studies were initiated to conduct germplasm screening trials to identify useful genetic differences in susceptibility / resistance to race 4 FOV that can be utilized in further genetic evaluations and to identify sources of host plant resistance useful to growers and breeders. Screening efforts have included Gossypium hirsutum (Upland) and Gossypium barbadense (Pima) plantings as well as other, more exotic Gossypium species to gain a broader perspective of susceptibility and host plant resistance. Screening efforts can be summarized as follows: (1) most Pima varieties show more severe symptoms and suffer higher levels of stunting and plant mortality than Acala/Uplands; (2) one highly-resistant commercial Pima variety and several USDA experimentals have been identified; (3) most Acala / Upland germplasm tested, while less severely impacted than most Pima varieties, were still infected by the race 4 FOV when tested at infested field sites or when inoculated in greenhouse trials.