EMERGENCE OF HIGHLY VIRULENT FOV'S

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Abstract

Fusarium wilt, caused by the soilborne fungus *Fusarium oxysporum* f. sp. *vasinfectum* (FOV), is an economically important and widespread disease of cotton. The disease was first reported in Alabama in the late 1800's and has since been identified in nearly all major cotton producing regions of the world. Fusarium wilt is favored by warm conditions and once established the fungus can persist in soil for long periods of time via the production of specialized resting structures called chlamydospores. These structures germinate in response to root exudates, infect and colonize the vascular system. Appearance of the disease varies by environmental conditions, age of the host plant, host cultivar, as well as inoculum density and genotype of the pathogen. The term race has historically been used when classifying FOVs, and designations have been maintained by the cotton industry. Historically, there were eight races of FOV; however, molecular classification and pathogenicity tests eliminated redundancy, resulting in six nominal races (1, 2, 3, 4, 6 and 8). Race 1 occurs in association with the root-knot nematode (*Meloidogyne incognita*) and is commonly found in the United States, the Ivory Coast, Tanzania and Zimbabwe, whereas, race 3 is most common in Egypt, Sudan and Israel. Race 4 is a particularly virulent genotype capable of causing disease in the absence of *M. incognita* and has been identified in India, China, Uzbekistan and California and Texas in the United States. New genotypes of FOV that conformed to race 1 based on results from host differential testing and race 6 based on alternative host results were identified in Australia in the 1990's. Genetic analysis of these isolates indicated that they were different from all known races. In addition, four novel genotypes were identified in the southeastern United States in the mid-2000's. More recent surveys also indicate that significant levels of diversity exist in FOV populations throughout the United States. Because of the importance of Fusarium wilt, emergence of novel genotypes and increased geographic distribution of virulent genotypes added emphasis is needed on characterizing FOV isolates.