CHARACTERIZATION OF FUSARIUM OXYSPORUM F. SP. VASINFECTUM ISOLATES FROM COTTONSEED IMPORTED FROM AUSTRALIA INTO CALIFORNIA FOR DAIRY FEED

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Abstract

Fusarium oxysporum f. sp. *vasinfectum* (*Fov*) is a continuing threat to cotton production in the United States as exemplified by the newly recognized Australian *Fov* biotypes in Australia and the identification of *Fov* race 4 in California that were causing serous damages to cotton production. Bell et al. recovered a total of 17 *F. oxysporum* isolates from cottonseed imported from Australia into California for dairy feed in 2003. In order to resolve the genetic relatedness of these Australian cottonseed isolates to the U.S. isolates and to isolates of Australian biotype, we sequenced fragments of translation elongation factor 1-α (EF-1α), phosphate permase , β-tubulin, and mating type (*Mat1-1* and *Mat1-2*) genes of these cottonseed isolates and conducted phylogenic and sequence analysis.

The Australian seed isolates and the four Kochman's Australian biotype isolates from wilted cotton plants in Australia were distinct from American *Fov* isolates in that they caused wilt in root dip assays, but not in stem puncture inoculations. One seed isolate, AustSeed 14, which was as aggressive as Kochman's isolates and vegetatively compatible with Kochman's isolates, belonged to race 3 lineage. Eleven of the 17 seed isolates also belonged to race 3 lineage and formed a vegetatively compatible group. One seed isolate belonged to race 1 lineage but was not vegetatively compatible with the U.S. race 1 lineage isolates. The remaining four seed isolates (AustSeed 1 group) does not belong to any known race lineages. Furthermore, indel analysis of the EF-1α gene sequences revealed a close evolutionary relationship among isolate AustSeed 14, Kochman's Australian isolates, and the four AustSeed 1 group seed isolates. Race 3 isolates favor alkaline clay soil and do not require nematodes to cause severe disease; this is also true for Australian biotypes. Thus, the Australian seed isolates may present a threat to the U.S. cotton industry.