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A COMPARISON OF FUSARIUM WILT IN AUSTRALIA AND THE UNITED STATES

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Abstract

Although Fusarium wilt caused by *Fusarium oxysporum* f. sp. *vasinfectum* (FOV) has been recognized as a serious disease of cotton in the United States since the 1890s, the disease has been observed in Australia only since the early1990s. Because the Australian isolates of FOV appear to be more virulent than US isolates, there has been some concern about the introduction of isolates from Australia into cotton fields in the United States. Before the extent of this potential threat can be determined, it is important to be able to distinguish between Fusarium wilt and isolates of FOV in the United States and Australia. There are several obvious differences between the United States and Australia in the development of Fusarium wilt. Wilt symptoms in the United States are more often observed on plants near mid-season and often do not result in mortality. Symptoms of wilt in Australia, however, frequently occur on seedlings and young plants and cause mortality that result in poor stands. These fields are often abandoned because profitable production is not possible. Another difference is the frequent association of the root-knot nematode with wilt in the United States, which is often referred to as the Fusarium wilt/root-knot nematode disease complex. The root-knot nematode has not been associated with wilt in Australia. In addition, cotton cultivars that have demonstrated moderate resistance to Fusarium wilt in the United States are not resistant to Australian isolates of the pathogen. These facts have led to the incorrect assumption that the Australian isolates are new races. Using the Armstrong differential host system, which includes *Gossypium* spp. and plants from other genera, the Australian isolates are classified as race 6, which was previously identified from Brazil in 1978. Isolates from the United States are classified as either race 1 or 2. Recent random amplified polymorphic DNA analysis (RAPD) placed race 6, along with races 1 and 2, into a unified group designated race A. Races 1, 2 and 6 are not different in their pathogenicity on cotton (*Gossypium* spp.) hosts. A comparison of Australian isolates with isolates from around the world using vegetative compatibility testing and DNA fingerprinting identified two strains from Australian that are distinct from other isolates from around the world. This information indicates that the isolates from Australia are two new strains of race 6 or race A, depending on the differential system used, and not new races.