## RESURGING SEED BORNE DISEASES: THE OLD BACTERIAL BLIGHT AND NEW FUSARIUM WILTS. Robert Loring Nichols Cotton Incorporated Cary, NC

In the 1970's the two must damaging diseases of cotton (*Gossypium hirsutum*) were Bacterial Blight caused by *Xanthomonas citri* pv.*malvacearum* (Xcm) and Fusarium Wilt caused by *Fusarium oxysporum* f. sp.*vasinfectum* (FOV). Both are seed-borne.

Bacterial Blight was endemic in the Southern Plains and frequently episodic throughout the humid region of the Cotton Belt. Breeding by Texas A&M and Oklahoma State Universities combined certain resistance genes that were broadly effective against the Xcm races then prevalent, including race 18. Together with general adoption of acid delinting of planting seed, the use of the resistance gene package greatly reduced the incidence of Bacterial Blight. However, in 2011, during the outbreak of Bacterial Blight in the north Delta, agronomists and breeders noted that many commercial cotton cultivars no longer claimed Bacterial Blight resistance. That outbreak never entirely subsided and serious incidence of Bacterial Blight has occurred in recent years in several states particularly Texas, Oklahoma, Mississippi, and Georgia. Recent data shows that race 18 remains the most common Xcm isolated from cotton in the field. But the majority of cotton acres are planted to susceptible cultivars. Hence the disease is again common. The occurrence of Bacterial Blight could be reduced by the availability of high-yielding commercial cultivars with resistance and planting of such cultivars by growers.

FOV race 1 (FOV1) had long been the most common form of FOV in the U.S. Symptoms often occur no earlier than the onset of flowering. FOV1 requires the presence of the root-knot nematode (RKN) (*Meloidogyne incognita*) to infect cotton. Controlling RKN with nematicides was an effective means of managing Fusarium Wilt. In 2004 a form of FOV that did not require the presence of RKN was found on the west side of the San Joaquin Valley (SJV) of California. Subsequent surveys of the U.S. found several FOV races and unclassified biotypes. Certain of these were highly virulent; they attacked and killed young cotton young plants. The SJV FOV was determined to be FOV4, a type previously found in India. FOV4 has now spread throughout the SJV and is a factor in the demise of the Acala cotton industry. Root-rotting FOVs, whose phenotypic effects resemble those of FOV4, have been found in Alabama and Georgia. A highly-virulent FOV that shares certain genes with FOV4 was first officially reported in Far West Texas this past spring. The virulent FOVs pose a serious threat to U. S., cotton production; they are capable of devastating cotton stands, persist for many years, and are not amenable to any known management except host plant resistance. Clearly a well-supported research program focused on host plant resistance breeding against the FOVs is needed.