Program 9C-2

▸ Cotton Disease Management Strategies

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A number of different diseases are capable of infecting cotton throughout the growing season. The seedling disease complex (caused by *Pythium* spp., *Rhizoctonia solani* and *Thielaviopsis basicola*) are capable of infecting emergence, stand establishment as well as growth and development. While seed treatment fungicides come standard on all commercially available seed, new products and combinations are routinely be evaluated. Bacterial blight, caused by *Xanthomonas axonopodis pv. malvacearum*, is capable of infecting cotton during any stage of development. The pathogen is capable of surviving short periods of time in residue in the soil and is known to be seedborne. Acid delinting greatly reduced the prevalence of bacterial blight, the identification of resistance genes and subsequent commercialization of resistant varieties has lessened the impact of this disease; however, there has been a resurgence of Bacterial blight over the past three to five years. In addition to these diseases, wilt diseases such as Fusarium and Verticillium are also capable of reducing yields under conducive conditions. Cool conditions tend to favor Verticillium wilt, caused by the soilborne fungus *Verticillium dahliae*. Management of Verticillium wilt requires an integrated approach with the use of partially resistant varieties serving as the cornerstone of any effective program. Recent studies have shown the excessive irrigation can exacerbate the disease, as well as increase populations of the fungus in the soil. Research is currently being conducted to use soil inoculum and mid-season soil temperatures to predict Verticillium wilt severity. By better understanding these factors, producers can adjust irrigation schedules accordingly to minimize disease development and maximize yield. Additional studies are being conducted to evaluate what effect(s) cultural practices, such as crop rotation, reduced seeding rates, planting date and tillage, have on the disease. Symptoms of Verticillium wilt are similar to those of Fusarium wilt, which is caused by *Fusarium oxysporum* f. sp. *vasinfectum*; therefore, proper disease diagnosis in required when employing management strategies

for this disease. Unlike Verticillium wilt, Fusarium wilt is generally associated with the root-knot nematode (*Meloidogyne incognita*), thus management strategies effective at minimizing nematode damage will indirectly impact the severity of Fusarium wilt. Currently, there are no chemical management options available for Fusarium wilt, but differences in the performance of varieties has been demonstrated. Likewise, chemical management options for nematodes in cotton (mostly root-knot and reniform (*Rotylenchulus reniformis*)) are limited. Temik is considered the commercial standard nematicide; however, its recent removal from the marketplace has resulted in the need for alternative methods. Applications of soil fumigants, such as Telone II, are effective at reducing nematode populations; however, high cost, availability, the need for specialized equipment and sporadic performance under dry conditions has limited its use. The use of seed applied nematicides has increased as a result of the loss of Temik; however, they are not considered a 'stand-alone' replacement. Vydate is the only nematicide labeled for use in season and many studies are being conducted to properly time applications. There is also much interest in screening new compounds for activity against nematodes. It is likely that new products will be labeled for use within the next two years. As with the other diseases mentioned, the development of resistant varieties will greatly benefit growers who are managing nematodes in cotton. Resistance to reniform nematodes has been identified in wild cotton species and introgressed into upland types; however, the commercial release of any reniform resistant varieties is to be determined. Fortunately, advances in the development of root-knot resistant varieties have resulted in a number of varieties being released within the past few years with additional varieties (possessing multiple genes for resistance) being developed. Results from field studies examining different management strategies for the aforementioned diseases will be presented.