

Gauging spotted wilt incidence in newer cultivars and its contribution to yield loss in peanut production

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Rationale and economic significance:

Spotted wilt caused by *Tomato spotted wilt virus* remains a major constraint for peanut production in GA. Spotted wilt incidences seem to fluctuate from year to year. Our statewide field surveys in 2016 and 2017 indicated that the incidence of spotted wilt ranged from 0 to ~40%. The cultivars used today are more resistant to TSWV than those planted in the past. But it is worth mentioning that there has been very few TSWV resistance sources, most of the resistance used today can be traced back to the same or similar resistant parentage. Also, none of these cultivars are immune to the virus or exhibit complete (or hypersensitivity-based) resistance. Therefore, it became critical that we estimated how these cultivars responded to TSWV infection under field conditions, and how much yield losses occurred. Further, for the first time in 2018, we empirically assessed the frequency and incidence of asymptomatic infections, and the effects these asymptomatic infections have on yield.

Results from the 2018 field season:

In 2018, we attempted to quantify losses due to TSWV in three newer cultivars (GA 06G, GA 16 HO, and TUFRunner 511) and in GA Green, and what TSWV infection meant economically. We followed spatial and temporal spread of spotted wilt by tagging individual plants, and attempted to correlate yield loss with infection timing (based on symptoms). Trials were conducted on both Tifton and Attapulgus UGA research farms. We also assessed the prevalence of asymptomatic infection and its relevance to economic yield loss.

Results indicated that TSWV infection increased in almost a linear fashion with time, and much of the infection occurred later in the season (35 through 120 days' post planting). The incidence of spotted wilt between 30 and 45 days' post planting was approximately 8 to 10 times less than at 120 days' post planting. The incidence of spotted wilt was identical in GA Green and in more field-resistant newer cultivars. These results were also consistent across both locations.

Results, in general, revealed that yield losses were inversely proportional to the timing of infection. That said, more than 50% yield loss due to TSWV infection was recorded even at 90 days after planting. The quality and grade losses are currently being assessed, and data will become available shortly. Incidence of TSWV infection in asymptomatic plants was heavily scrutinized using at least two standardized tests, and results seem to vary substantially with the test used. Altogether, evidence in 2018 suggests that asymptomatic infections were not so common, and yield losses to such infections could be minimal. Another season's data will help address this better