

Comparison of Susceptibility to *Tomato spotted wilt virus* in PVH 2310 and NC 196 Varieties of Tobacco

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Introduction

The leading tobacco disease in Georgia is spotted wilt caused by *Tomato spotted wilt virus*. Previous research has shown there is no difference in resistance to *Tomato spotted wilt virus* (TSWV) between common varieties of tobacco. No source of resistance has been identified or incorporated into commercial tobacco. However, trials conducted in 2018 and 2019 suggested that PVH 2310 may be more susceptible to TSWV than other popular varieties such as NC 196. PVH 2310 is often selected to utilize barn space more efficiently due to its early maturity and competitive yields. Thus, determining whether PVH 2310 exhibits higher incidence of TSWV compared to another common variety does have value to tobacco growers in South Georgia.



Figure 1. Setting plants at the Lanier County trial site, April 7, 2020.

Materials & Methods

Treated and untreated PVH 2310 plants were compared to treated and untreated NC 196. The treatment consisted of separate applications of Actigard[®] 50WG and AdmirePro[®]. Actigard[®] 50WG was applied as a foliar spray in the greenhouse at the rate of 1.0 oz per 100,000 seedlings. Six days later, AdmirePro[®] was applied as a spray-on/rinse-off tray drench at a rate of 0.8 oz per 1,000 tray cells.

Plants were transplanted into six trials between April 7 and April 9, 2020 (Figure 1). Each trial site consisted of treated PVH 2310, untreated PVH 2310, treated NC 196, and untreated NC 196 in a randomized complete block design (RCBD) with three replications. Incidence of spotted wilt was visually evaluated on all plants of each treatment at two-week intervals, beginning two weeks after transplanting and ending 12 weeks after transplanting (Figures 5 & 6).

Results

The untreated PVH 2310 (2310-CK) had higher incidence of TSWV than the untreated NC 196 (196-CK) across all trials. The treated PVH 2310 (2310-AA) also had higher incidence of TSWV than the treated NC 196 (196-AA) across all trials throughout the 12-week evaluation period (Figure 2). The final mean percent of TSWV was 23.0% in untreated PVH 2310, 14.7% in treated PVH 2310, 15.8% in untreated NC 196, and 10.5% in treated NC 196 (Figure 3).

The response to treatment was equal for both varieties. The Actigard[®] / AdmirePro[®] treatment resulted in 36.1% control in PVH 2310 and 33.5% control in NC 196. The percent control was not significantly different ($p = 0.05$) between varieties.

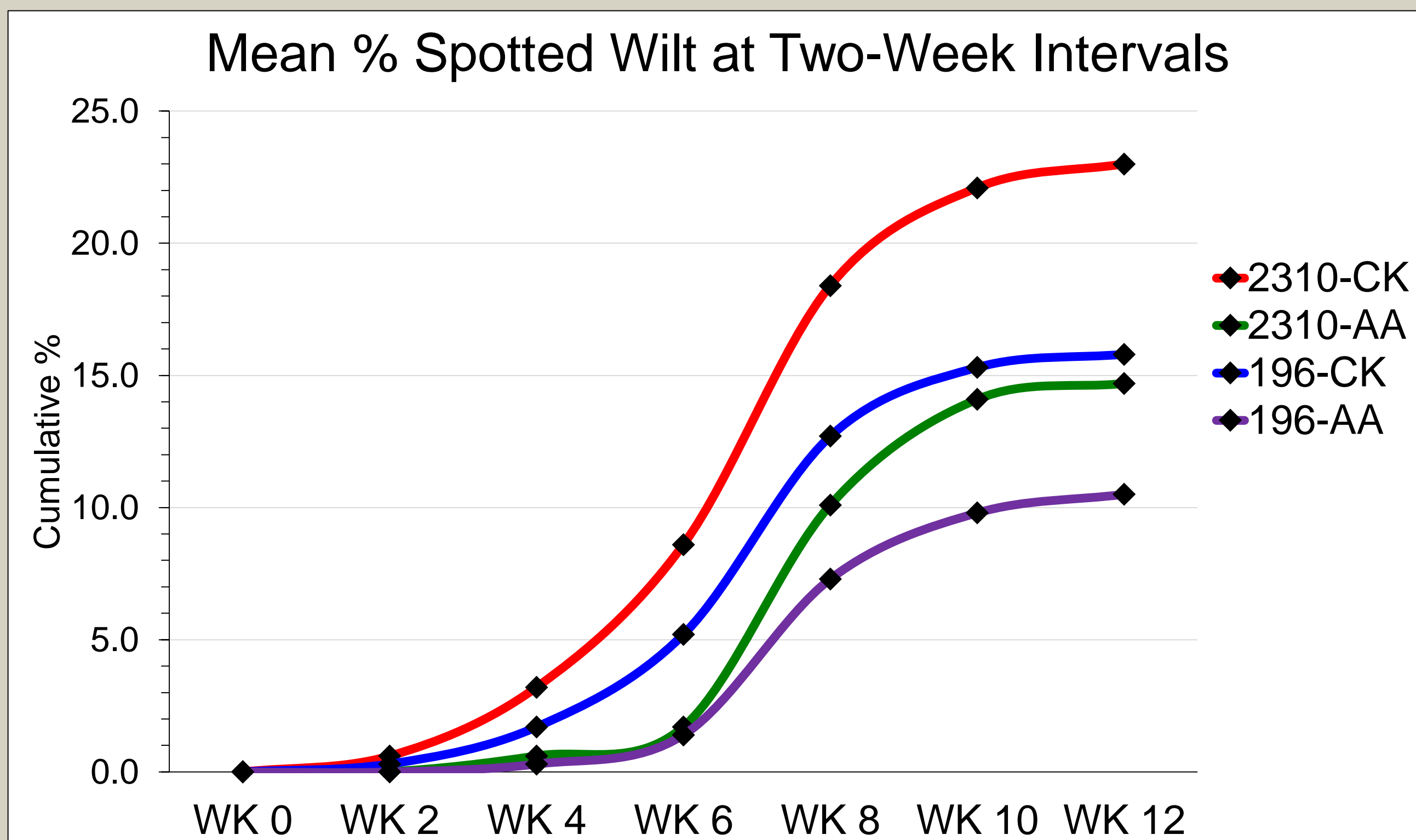


Figure 2. Mean cumulative percent spotted wilt across all trials in each treatment at two-week intervals after transplant.

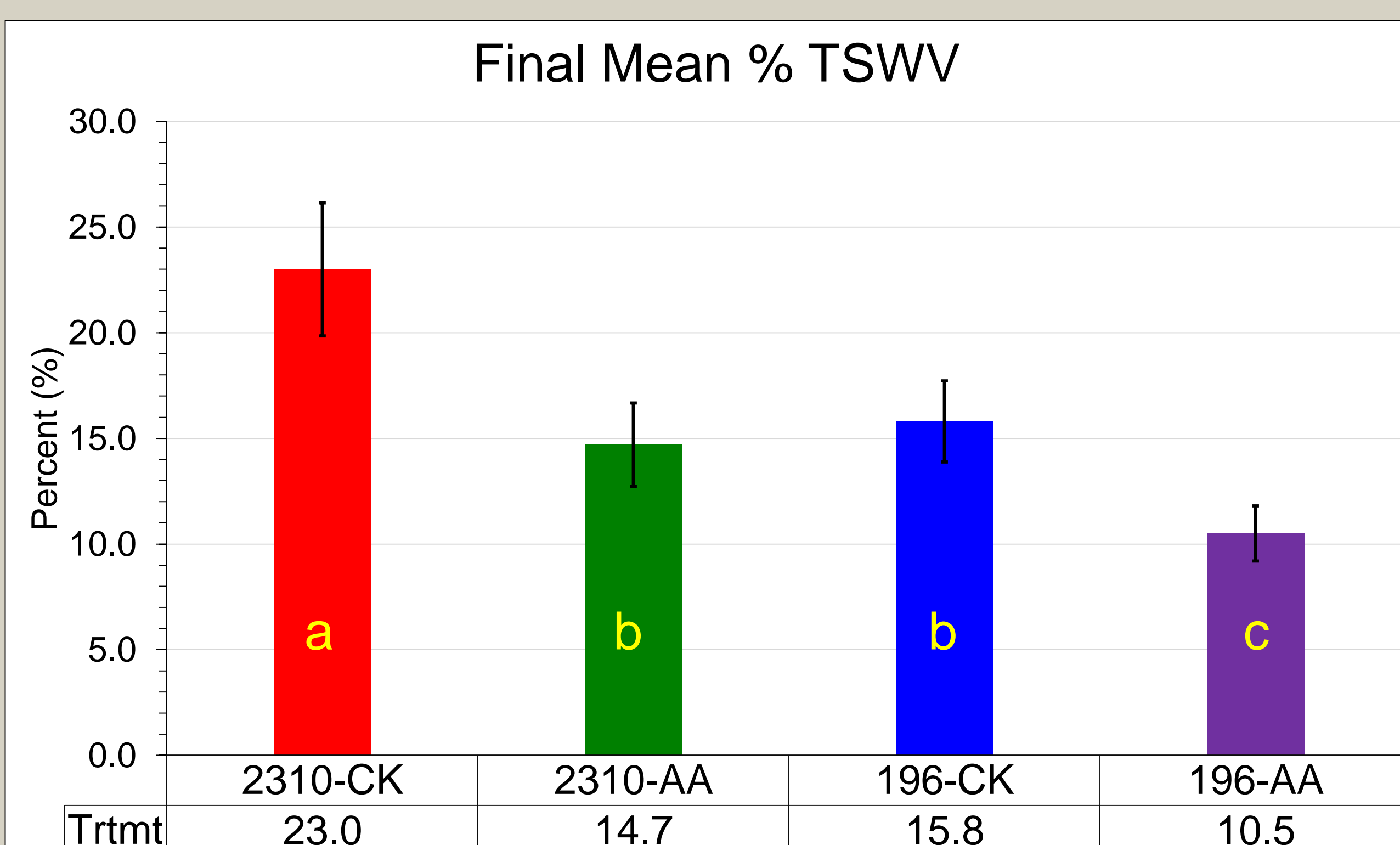


Figure 3. Final mean percent spotted wilt across all trials in each treatment. Bars containing a different letter are significantly different ($p = 0.05$).



Figure 4. Lanier County trial site at the Week 4 evaluation. Treated plants are noticeably smaller than untreated plants at this stage.

Conclusions

The data indicates that PVH 2310 is more susceptible to spotted wilt than NC 196, regardless of whether it was untreated or received Actigard[®] 50WG / AdmirePro[®] treatment. The reason for this is unknown. The ultimate conclusion is growers should exercise caution when choosing PVH 2310 as an early-maturing variety to fill barns, as its higher incidence of TSWV may not be worth the risk.

Even though resistance to TSWV has not been found, breeders should be aware that increased susceptibility does exist and take this into account in planning crosses.

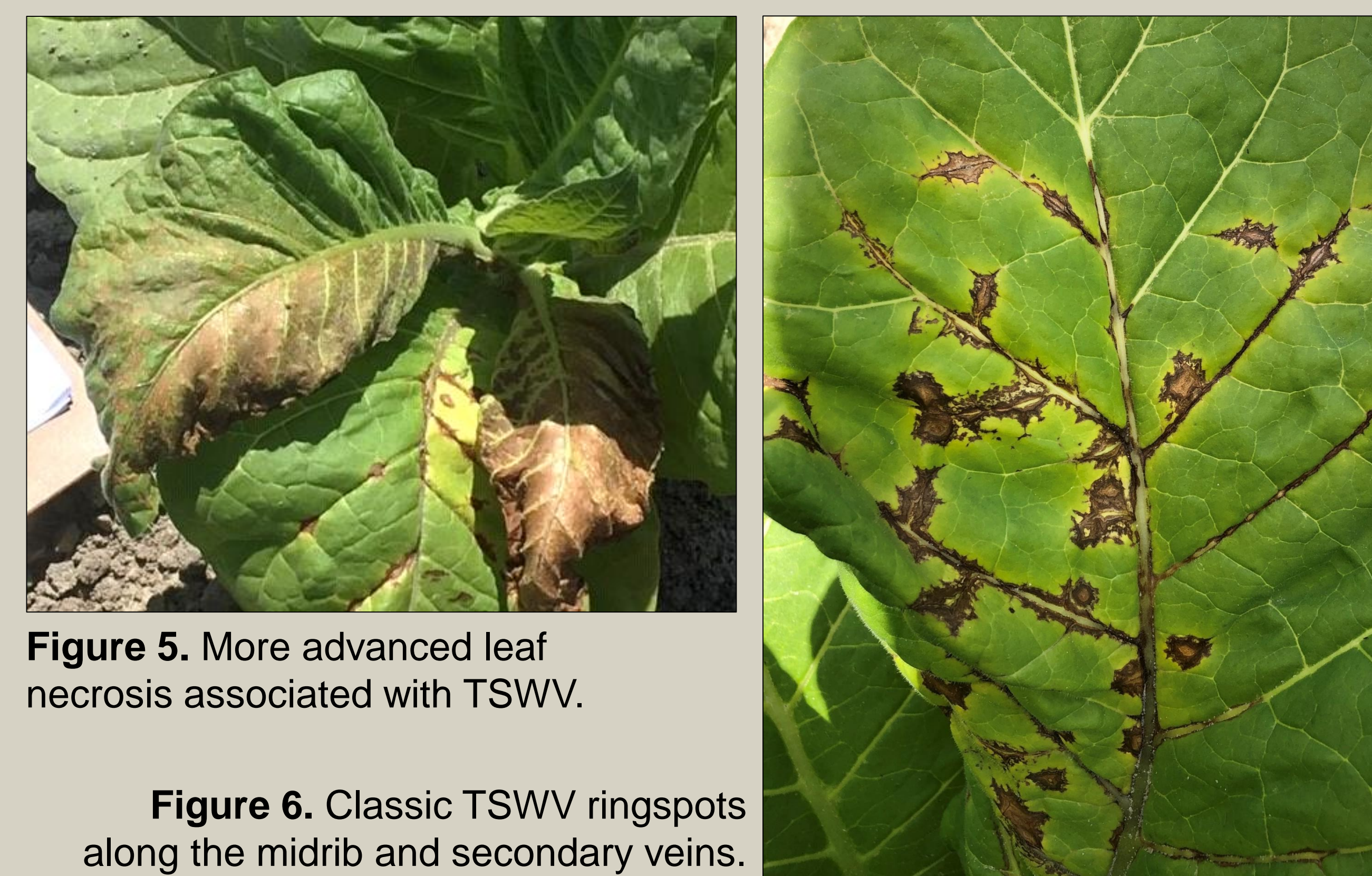


Figure 5. More advanced leaf necrosis associated with TSWV.

Figure 6. Classic TSWV ringspots along the midrib and secondary veins.



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