

Evaluation of Root-knot Nematode (RKN) Resistant Peanut Varieties and a Plant Growth Regulator (PGR) in Southwest Georgia

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Introduction

Southwest Georgia row crops fields are notorious for having both Root-knot nematodes (RKN) and highly variable soil types. RKN are microscopic parasites that feed on the plants which leads to decreased root size, shorter shoots, and in severe cases, plant death. RKN symptoms include stunting and chlorosis. The fewer pegs and pods produced can result in significantly lower yields. Recently, the development of RKN-resistant peanut varieties has allowed peanut producers to obtain high yields while cutting the cost of using nematode treatment products like nematicides. Additionally, with highly variable soil types in the area, in places where RKN may not be a pressing issue, management of excessive vine growth may be. Plant Growth Regulators (PGRs) containing the active ingredient prohexadione calcium are marketed to reduce canopy growth and improve row definition to assist with harvest. In this trial, 4 RKN-resistant varieties (TifNV-hiol, Georgia 22-MPR, TifNV-HG, and Georgia 14N) were evaluated for yield, as were the effects of the PGR product Kudos® on the number of nodes and height of the peanut mainstem.

Materials and Methods

6-row plots of 4 RKN-resistant varieties (TifNV-hiol, Georgia 22-MPR, TifNV-HG, and Georgia 14N) and 2 non-resistant varieties (Georgia 06G and FloRun 52N) were planted in a single row pattern into 3 replicates with an area of approximately 0.6 acres on May 9th, 2023. Measurements of plant stand counts, taste, % Tomato spotted wilt virus (TSWV) infection, and visual observations were taken throughout the growing season. The peanuts were inverted on October 2nd, 2023 (146 DAP) and harvested on October 6th, 2023 (150 DAP). In the PGR trial, Georgia 06G peanuts were planted on May 27th, 2023 as 6-row plots into 4 replicates each of treated (with Kudos®) and untreated, with each treatment area measuring approximately 0.7 acres. In compliance with the Kudos® label, it was applied at 5.4 oz with 1 pt of ammonium sulfate (AMS) and 1 qt of crop oil concentrate (COC) on August 8th, 2023 (73 DAP) and again on August 22nd, 2023 (87 DAP). The mainstem height and number of nodes per mainstem from 5 randomly selected plants in each replicate were measured at 28 DAT and again at 42 DAT. The trial was inverted on October 27th, 2023 (153 DAP) and harvested on October 31st, 2023 (157 DAP).

Results

In terms of yield, TifNV-HG yielded the highest at 5958 lbs/acre. The other RKN-resistant varieties ranged from 5013 lbs./acre (TifNV-hiol) to 5529 lbs/acre (*Georgia 22-MPR). Surprisingly, a non-resistant variety (FloRun 52N) yielded well (5459 lbs/acre), probably due to the only moderate nematode pressure in some areas of the field. Statistically, there were no differences in %TSWV infection across varieties, but the Georgia 22-MPR and Georgia 14N did have significantly more plants/ft

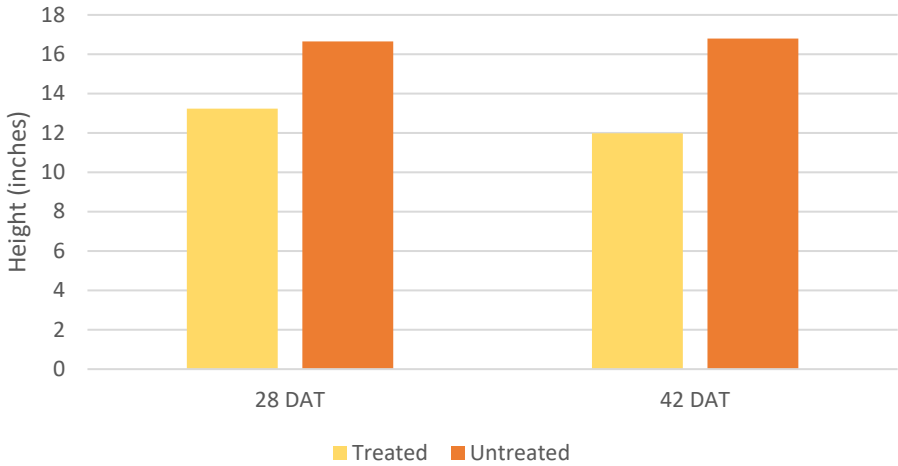
than the other varieties (4.53 and 4.5, respectively). The taste test results (on a scale of 1-10) from a blind panel of 4 judges are displayed in Table 1 along with the %TSWV infection per variety. In the PGR trial, there was a statistically significant difference in both the mainstem height and height-to-node ratio at both 28 DAT and 42 DAT. At both times, the treated group had a significantly lower mainstem height and a significantly lower height-to-node ratio.

Conclusions and Acknowledgements

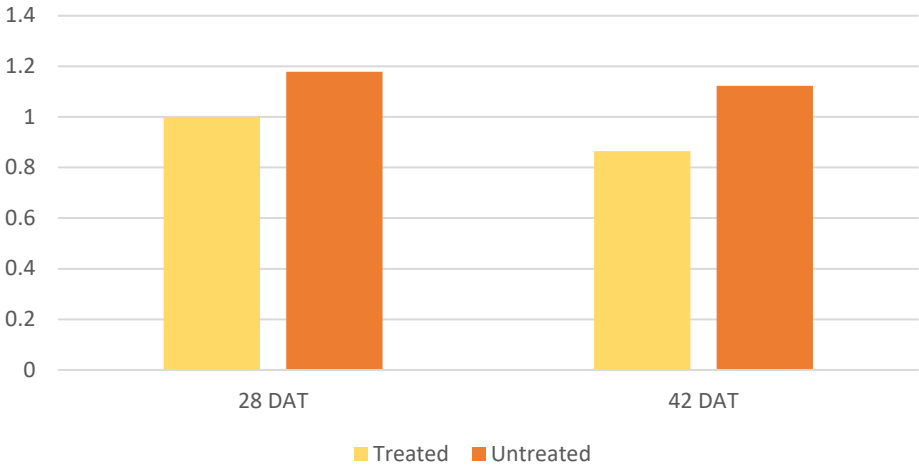
The data suggests that our newer RKN-resistant varieties have a greater yield potential than some of our older resistant varieties (Georgia 14N and TifNV-hiol) as well as our most popular non-resistant variety (Georgia 06G) when planted in fields with RKN pressure. Interestingly, another newly developed variety that is not RKN-susceptible (FloRun52N) has exhibited great yield potential in the presence of RKN. These results provide hope for the future of the development of high yielding varieties that are also RKN-resistant. Additionally, the data also suggests that the PGR product Kudos[®] does assist with managing fine growth by reducing the plants' mainstem height and lowering the height-to-node ratio, resulting in a compact row orientation. It remains to be seen, however, if the use of PGRs increases yield potential and can be applied in a manner that also produces economic benefits. Further testing of these factors will be of the utmost importance going forward, so that peanut producers can remain profitable. The authors would like to thank Jason Blankenship, Dillard Farms, Justin Tanner from Georgia Seed Development, Scott Rogers, and the staff of the Southwest Georgia Research and Education Center for their collaboration on this project.

Appendix

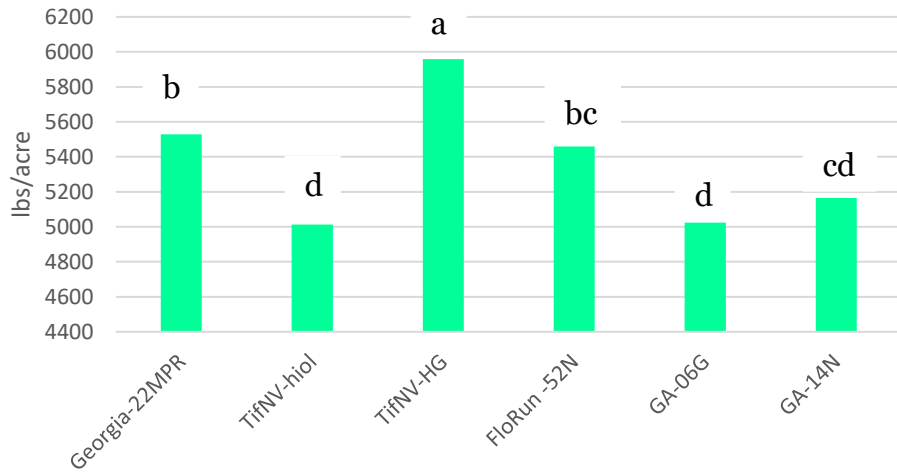
Mainstem height over time



Height-to-node ratio



Yield Results



Plant Population

