

Evaluation of Root-knot Nematode (RKN) Resistant Peanut Varieties and the Effects of a Plant Growth Regulator (PGR) on 3 Peanut Varieties 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) and one susceptible variety (06-G, as the control) were evaluated for yield, as were the effects of the PGR product Kudos[®] on the yield of 3 different runner-type peanut varieties (06-G, TifNV-HG, and CB7).

Materials and Methods

6-row plots of 4 RKN-resistant varieties (TifNV-hiol, Georgia 22-MPR, TifNV-HG, and Georgia 14N) and 1 non-resistant variety (Georgia 06G) were planted in a single row pattern into 3 replicates with an area of approximately 0.6 acres on May 30th, 2024. Measurements of plant stand counts, % Tomato spotted wilt virus (TSWV) infection, and visual observations were taken throughout the growing season. The peanuts were inverted on November 25th, 2024 (179 DAP) and harvested on December 2nd, 2024 (186 DAP). In the PGR trial, Georgia 06G, TifNV-HG, and CB7 peanuts were planted on May 28th, 2024 as 6-row plots into 3 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 2nd, 2024 (66 DAP) and again on August 18th, 2024 (82 DAP). The trial was inverted on November 25th, 2024 (181 DAP) and harvested on December 3rd, 2024 (189 DAP).

Results

In terms of yield, TifNV-HG yielded the highest at 5346 lbs/acre. The other RKN-resistant varieties ranged from 5146 lbs./acre (TifNV-hiol) to 5267 lbs/acre (Georgia 22-MPR). The susceptible variety, 06-G, yielded much lower (2994 lbs/acre) due to the severe nematode pressure in the field. Statistically, there were no differences in %TSWV infection across varieties. In the PGR trial, the TifNV-HG and CB7 varieties exhibited a greater yield when the PGR was applied, but the 06-G suffered a yield reduction.

Conclusions and Acknowledgements

The data suggests that our newer RKN-resistant varieties have a greater yield potential than some of our older resistant varieties such as TifNV-hiol as well as our most popular non-resistant variety (Georgia 06G) when planted in fields with RKN pressure. 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 increasing yield in some peanut varieties, but not all. It remains to be seen, however, exactly which varieties benefit the most from PGR applications. 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 Moore 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.