

PEANUT RESPONSE TO SOIL-APPLIED GLYPHOSATE

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INTRODUCTION

Glyphosate is one of the most widely used herbicides for weed control in many crops. Glyphosate has an average ½-life in soils of 30 days with a range of 5.7 to 40.9 days. The majority of research suggests that soil-applied glyphosate is tightly bound/adsorbed and therefore, has a low potential to cause plant phytotoxicity. However, there have been some reports of soil applications causing unacceptable crop injury depending upon numerous factors including species sensitivity, rate, soil type, and phosphate fertilizer competition. Limited research has focused on the potential negative effects of soil-applied glyphosate on peanut. Therefore, the objective of this research was to determine the effects of soil-applied glyphosate on peanut growth and yield.

MATERIALS AND METHODS

An irrigated, small-plot field trial was conducted in 2020 at the UGA Ponder Research Farm near Ty Ty, Georgia. The soil type at this location was a Tifton sand (0.61% OM, 94% sand, 2% silt, 4% clay, 6.0 pH, and 2.2 CEC). Twin-row 'GA-06G' peanuts were planted on May 4, 2020. Treatments were arranged in a randomized complete block design with a 2 (timing) X 6 (rate) factorial arrangement with 4 replications. Timings were 6 days before planting (PPLNT) and 1 day after planting (PRE). Glyphosate rates were 0, 1.13, 2.25, 3.38, 4.50, and 5.63 lbs ae/A (Roundup PowerMax® II). Treatments were applied with a CO₂-powered backpack sprayer calibrated to deliver 15 GPA (40 PSI, 3.5 mph, 11002AIXR nozzles). The plot area was maintained weed-free using a combination of labeled herbicides and hand-weeding. Data collected included peanut plant density, canopy height/width, and yield. All data were subjected to ANOVA and means separated using Tukey's HSD (P = 0.10).

Figure 1. Peanut Response to Glyphosate – 105 DAP.



Figure 2. Peanut Plant Density as Influenced by Glyphosate Rate*.

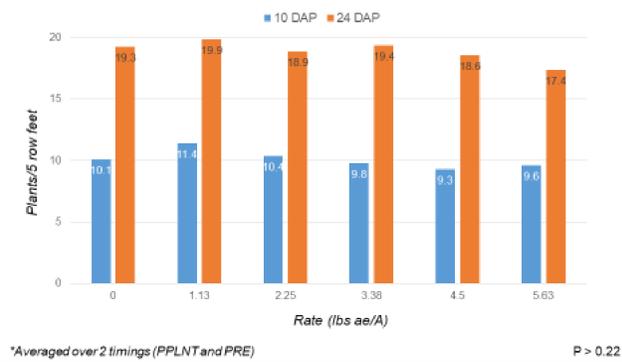


Figure 3. Peanut Canopy Height/Width (50 DAP) as Influenced by Glyphosate Rate*.

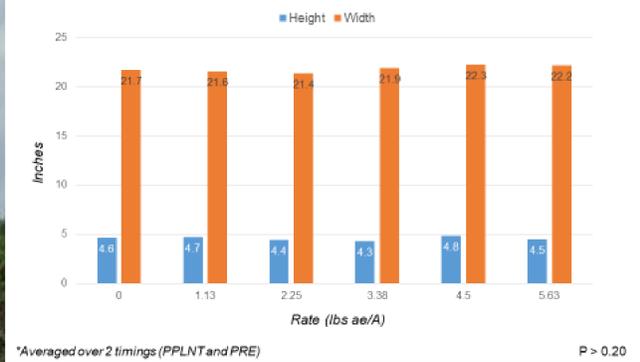
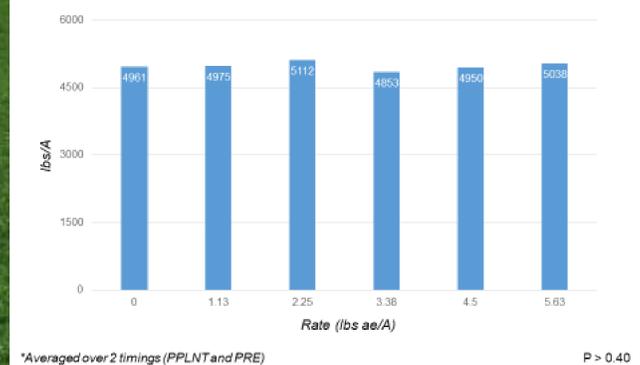


Figure 4. Peanut Yield as Influenced by Glyphosate Rate*.



RESULTS AND DISCUSSION

- 1) There were no interactions between glyphosate timing and rate (P > 0.14).
- 2) When averaged over rate, timing had no effect on peanut plant density, canopy height/width, and yield (P > 0.15). *Data not reported.*
- 3) When averaged over timing, rate had no effect on peanut plant density, canopy height/width, and yield (P ≥ 0.20). (*Figures 1, 2, 3, and 4.*)

CONCLUSION

- 1) Glyphosate can be used for PPLNT/PRE weed control programs in peanut without causing undesirable crop injury.