Seedbed Preparation Techniques and Weed Control Strategies for Strip-Planting Rhizoma Peanut into Bahiagrass Pastures

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Introduction

Despite the demonstrated potential of rhizoma peanut (*Arachis glabrata* Benth.; RP) for grazing in the southeastern USA, high establishment cost has limited its use to primarily hay production systems. Planting RP in strips into bahiagrass (*Paspalum notatum* Flügge) pastures may be a lower-cost alternative to achieve a grass-legume mixture, but research is needed to determine the best seedbed preparation methods. The objectives were to quantify the effects of four seedbed preparation techniques and four post-emergence weed control strategies on RP establishment when strip-planted into existing bahiagrass pastures.

Materials and Methods

Location: Beef Research Unit, Gainesville, FL.

Treatments:

Seedbed preparation techniques:

1) Glyphosate + tillage; 2) tillage only; 3) glyphosate + no-till; and 4) sod removal

Weed control strategies:

1) Control (no herbicide, no mowing); 2) mowing (every 28 d to 10-cm stubble height); and single application of herbicides 3) imazapic (0.29 L ha^{-1}); and 4) imazapic (0.29 L ha^{-1}) + 2,4-D amine (0.58 L ha^{-1}).

Results and Discussion

Sprout emergence was greater in treatments where tillage occurred (119, 90, 58 and 54 sprouts m^{-2} for glyphosate + tillage, tillage only, no-till and sod lifted, respectively) (Fig. 1).

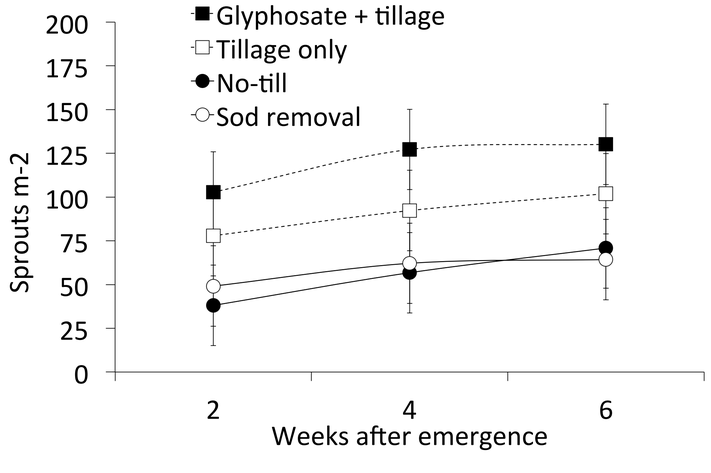

Figure 1. Sprout emergence of rhizoma peanut planted in strips in existing bahiagrass plots. Seedbed preparation and sampling date effects were significant ($P < 0.05$). Data are averages of 2 yr (2011 and 2012). Error bars represent treatment means (n = 24) ± one standard error.

Canopy cover of RP in glyphosate + tillage, no-till, and sod removal continued to increase through August compared with tillage only which plateaued in July (Fig. 2). In September, canopy cover in no-till was greater than the other seedbed preparation techniques. In the control treatment canopy cover of RP remained ~7%, while in the mowing treatment it increased to a max. of ~11% in July and to ~25% for imazapic and imazapic + 2,4-D in September (Fig. 2). By the end of the season there was no difference in canopy cover for imazapic and imazapic + 2,4-D amine treatments, but both treatments were greater than the control and mowing. **Frequency of RP** followed the same pattern as canopy cover (Fig. 2).

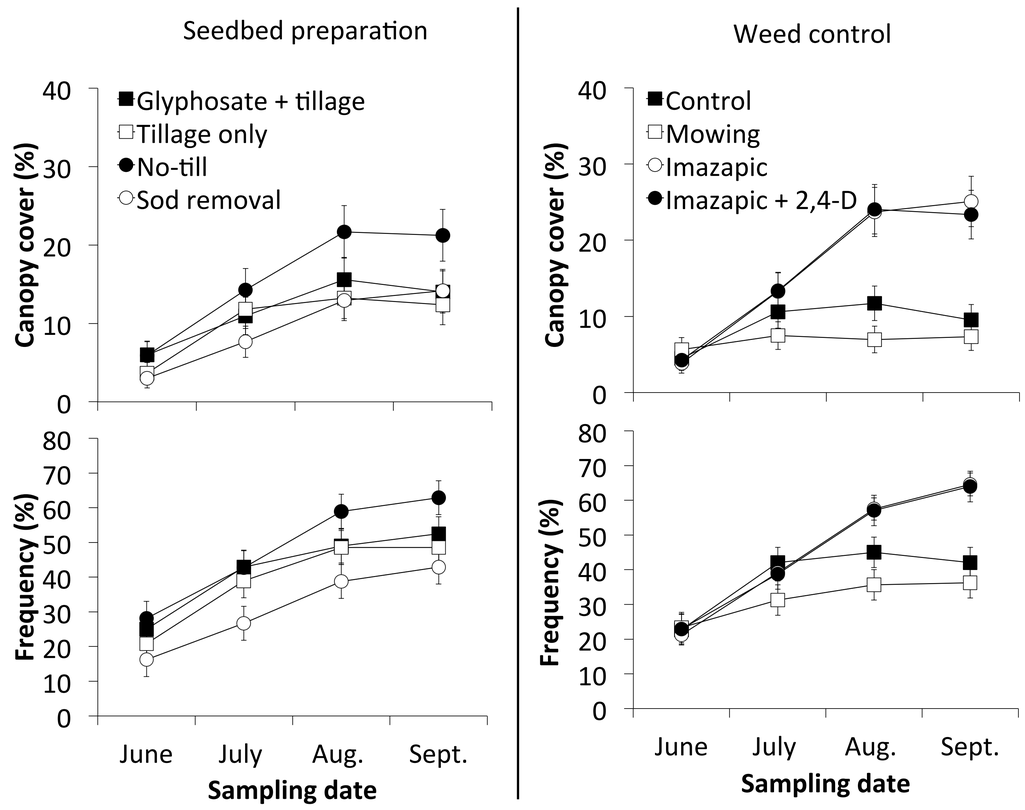

Figure 2. Canopy cover and frequency of occurrence of rhizoma peanut planted in strips in existing bahiagrass pastures as a function of sampling date interactions with four seedbed preparation techniques ($P = 0.04$) and four weed control strategies ($P < 0.01$). Data are means across 2 yr. Error bars represent treatment means (n = 24) ± one standard error.

Conclusions and Implications

- In spite of the advantages of tillage for sprout emergence, there was a strong trend ($P = 0.06$) for RP canopy cover to be greater for the no-till treatment (21%) than for glyphosate + tillage (14%), tillage only (14%), or sod removal (12%) treatments by September of the establishment year.
- Weed control strategies imazapic and imazapic + 2,4-D resulted in greater RP canopy cover and frequency than the control or mowing.
- Post-planting control of weeds or bahiagrass with imazapic or imazapic + 2,4-D was beneficial regardless of seedbed preparation treatment, but under the conditions of this experiment there was no additional benefit of imazapic + 2,4-D vs. imazapic alone.