Seedbed Preparation of Rhizoma Peanut Living Mulch for Cereal Production

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Introduction

Low input systems decrease the use of external chemical inputs. A perennial leguminous rhizoma peanut (RP) living mulch can provide nitrogen input instead of fertilizer through biological nitrogen fixation. Seedbed preparation can potentially provide weed suppression in the absence of herbicides as well as mitigate inter-species competition. Balance within such a production system is difficult to attain.

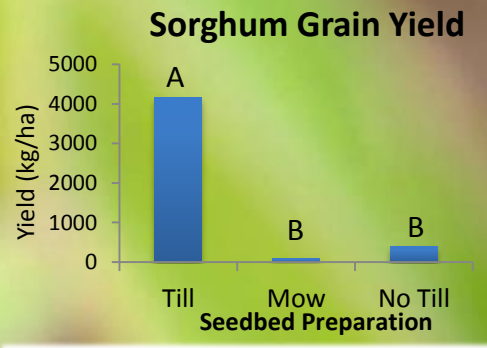
Objectives

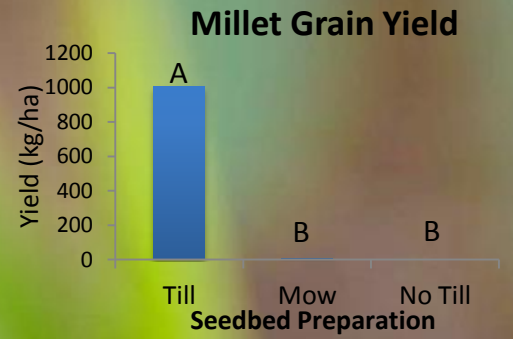
Measure effects of seedbed preparation methods (till, mow, no-till) of RP living mulch on:

- RP persistence
- weed suppression
- cereal grain yield
- cereal biomass dry matter yield.

Methods

We prepared seedbed strips within an established RP field and then planted strips of pearl millet and grain sorghum in early (T1) and late (T2) season. Weeds, cereal biomass, and cereal grain were harvested and compared. We counted RP upon management and the following spring.





Results

- Tillage yielded the greatest cereal grain yields ($P \leq 0.05$). (See above)
- Biomass yields were similar.
- Weed mass was greatest ($P \leq 0.05$) under tillage at T1.
- Tilling yielded the greatest ($P \leq 0.05$) 2014 RP reemergence.
- Grain and biomass yields did not favorably compare to conventional systems.

Conclusions

Competition among RP, weeds, and cereal species was difficult to mitigate in a way that did not negatively affect herbage or grain yield. Seedbeds that suppressed weeds tended to reduce grain and forage production of the cereal species. Tillage, however, led to the greatest herbage and grain production and post-season RP persistence. Future research is needed to recommend this system over conventional systems.

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