

# POTENTIAL FOR SUNN HEMP TO SUPPRESS NEMATODES IN SUGARCANE CULTIVATION

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## INTRODUCTION

- Plant-parasitic nematodes are significant pathogens of sugarcane, costing the Australian sugar industry more than \$80 million in productivity annually. (Blair and Sterling, 2007)
- There are limited management options available for controlling pathogenic sugarcane nematodes.
- Sunn hemp is believed to be a poor-host legume that can suppress plant parasitic nematodes through allelopathic activity and soil modification (Wang and McSorely, 2026)
- The aim of this study is to evaluate the efficacy of two sunn hemp cultivars, Crescent Sunn and Freyr, in suppressing nematodes under controlled conditions.

## METHODS

Nematode suppression was evaluated under five treatment conditions at SRA Woodford Pathology Station. (Figure 1.)

### Treatments:

- 1) Cres soil: Potting mix in which the cultivar Crescent Sunn had been grown.
  - 2) Freyr soil: Potting mix in which the cultivar Freyr had been grown.
  - 3) Cres soil + tissue: Cres soil mixed with shredded Crescent Sunn plant tissue.
  - 4) Freyr soil + tissue: Freyr soil mixed with shredded Freyr plant tissue.
  - 5) Sterilised potting mix, no sunn hemp added, used as a control treatment
- Sugarcane cultivar Q208<sup>(1)</sup> was pre-germinated, planted in a 10-replication trial using the five soil treatments for each nematode species using randomised complete block (RCB) design. (Figure 2.)
  - Root-knot trial pots were inoculated with 5000 nematode eggs and root-lesion trial pots were inoculated with 2000 nematodes.
  - Plants were harvested after eight weeks and nematodes extracted and enumerated under a compound microscope.

## REFERENCES

Blair BL, Stirling GR, 2007: *The role of plant-parasitic nematodes in reducing yield in fine-textured soils in Queensland, Australia. Australian Journal of Experimental Agriculture* 47: pages 620 – 634.

Wang K-H, McSorely R, 2026: *Management of Nematodes and Soil Fertility with Sunn Hemp Cover Crop*. University of Florida, IFAS Extension, ENY-717.



Figure 1. Sunn hemp plants growing in soil



Figure 2. Sugarcane cultivar Q208 growing in an airconditioned bench

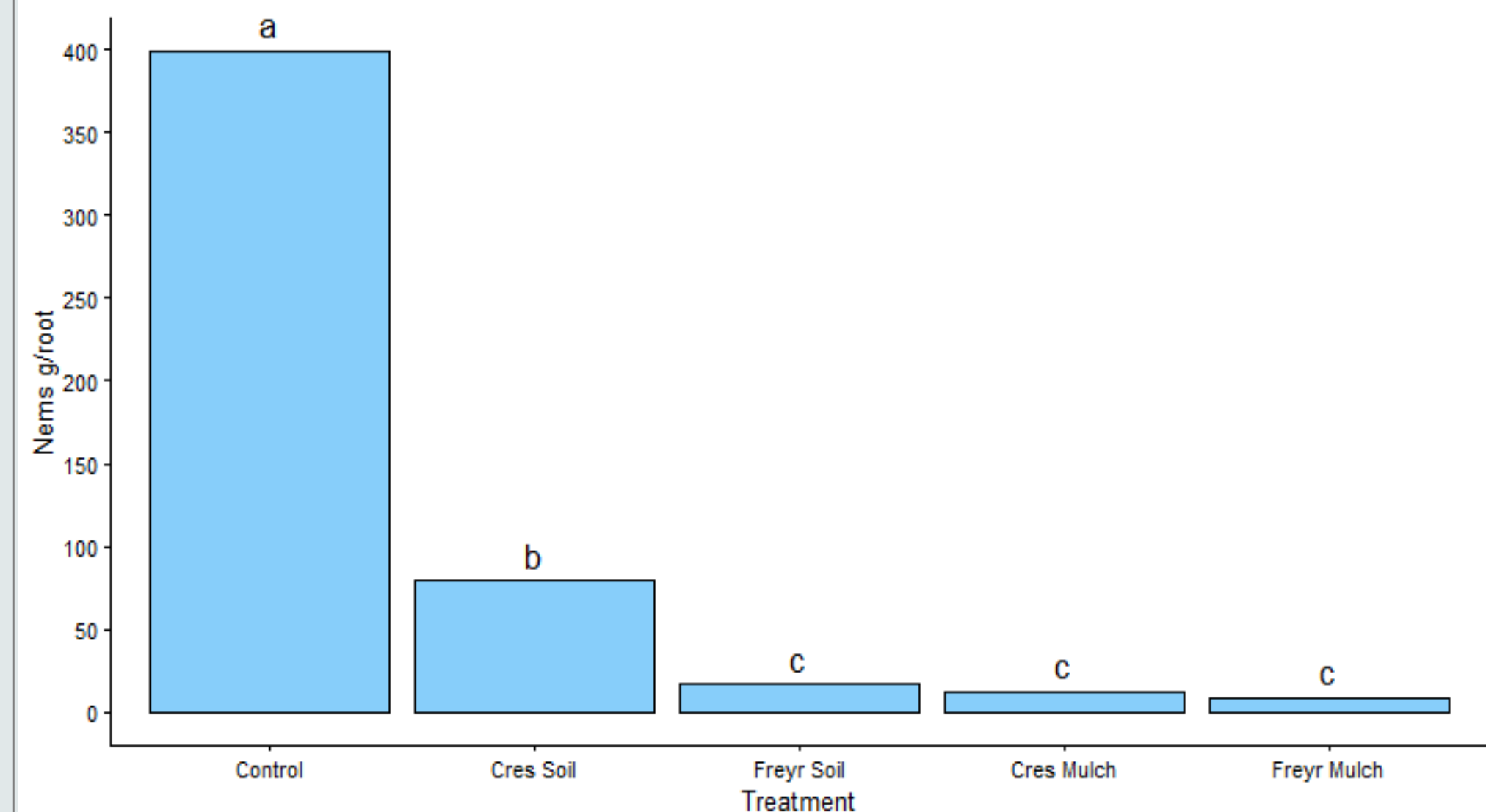


Figure 3. Effects of sunn hemp on the suppression of root-lesion nematodes. Each bar represents the mean of ten replications. Bars labelled with the same letter are not significantly different using Fisher's least significant difference (LSD) test (P=0.05)

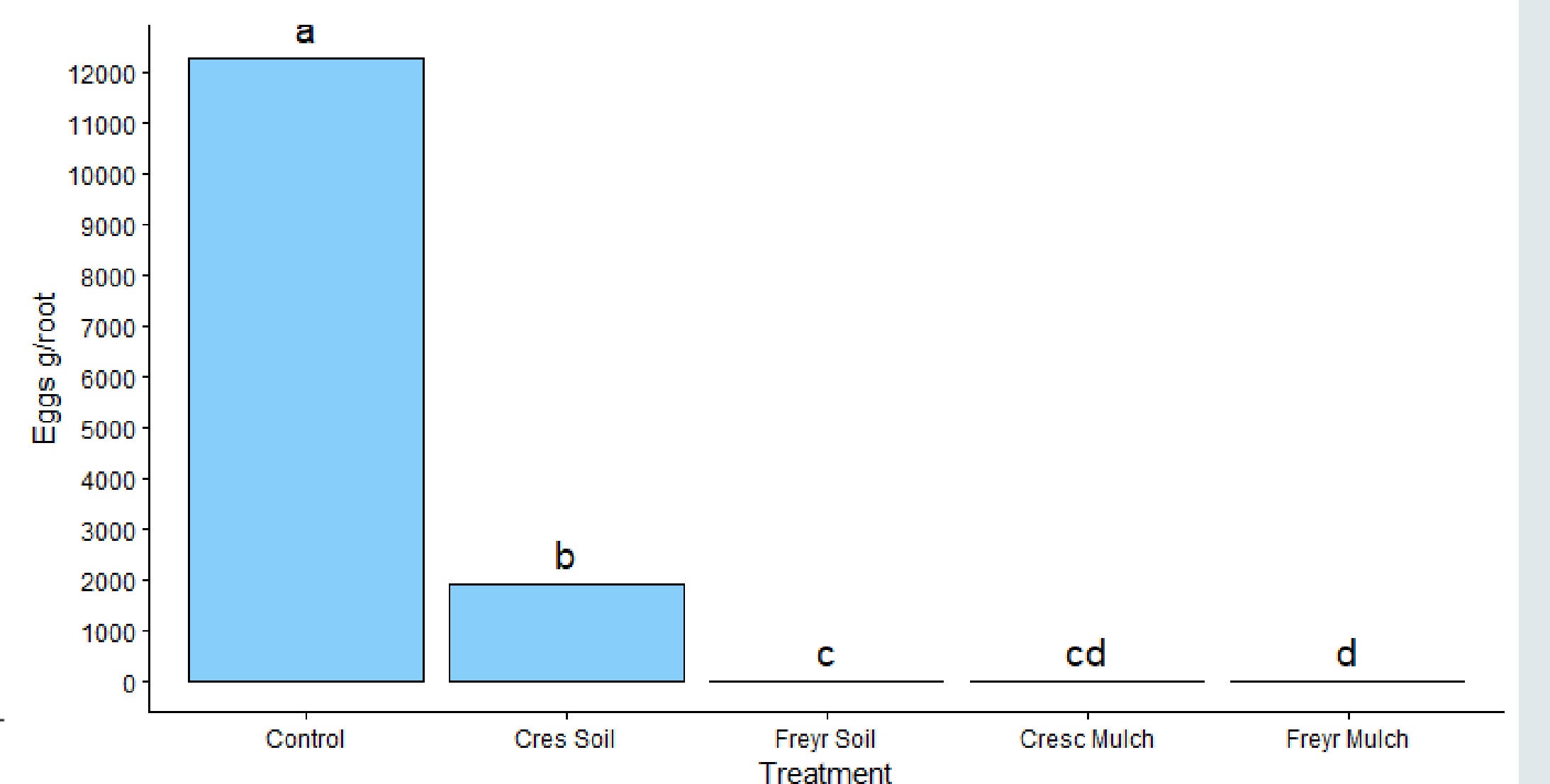


Figure 4. Effects of sunn hemp on the suppression of root-knot nematodes. Each bar represents the mean of 10 replications, bars labelled with the same letter are not significantly different (Fisher's LSD test (P=0.05))

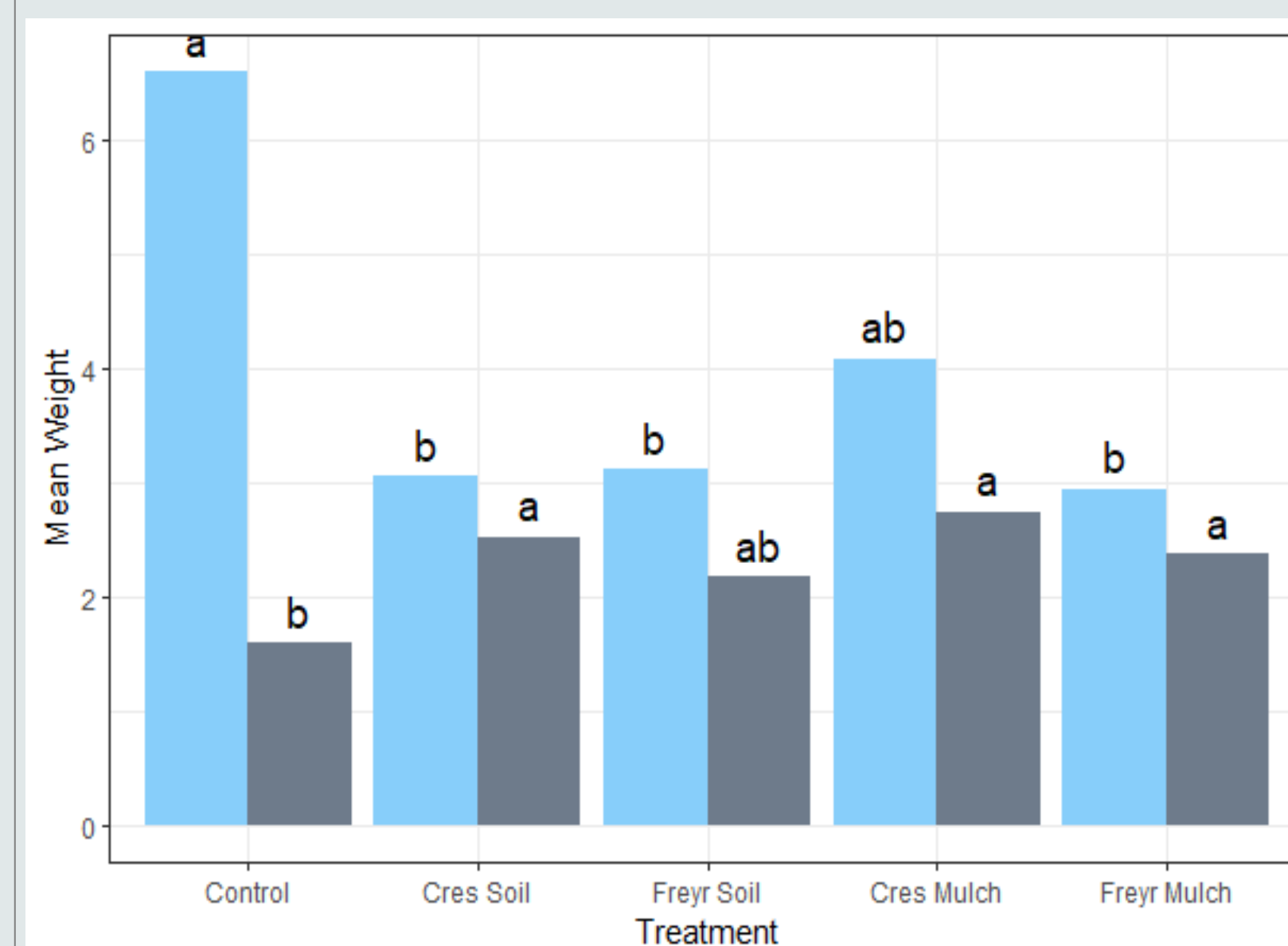


Figure 5. Root and shoot biomass of sugarcane, treated with sunn hemp and inoculated with root-lesion nematodes.

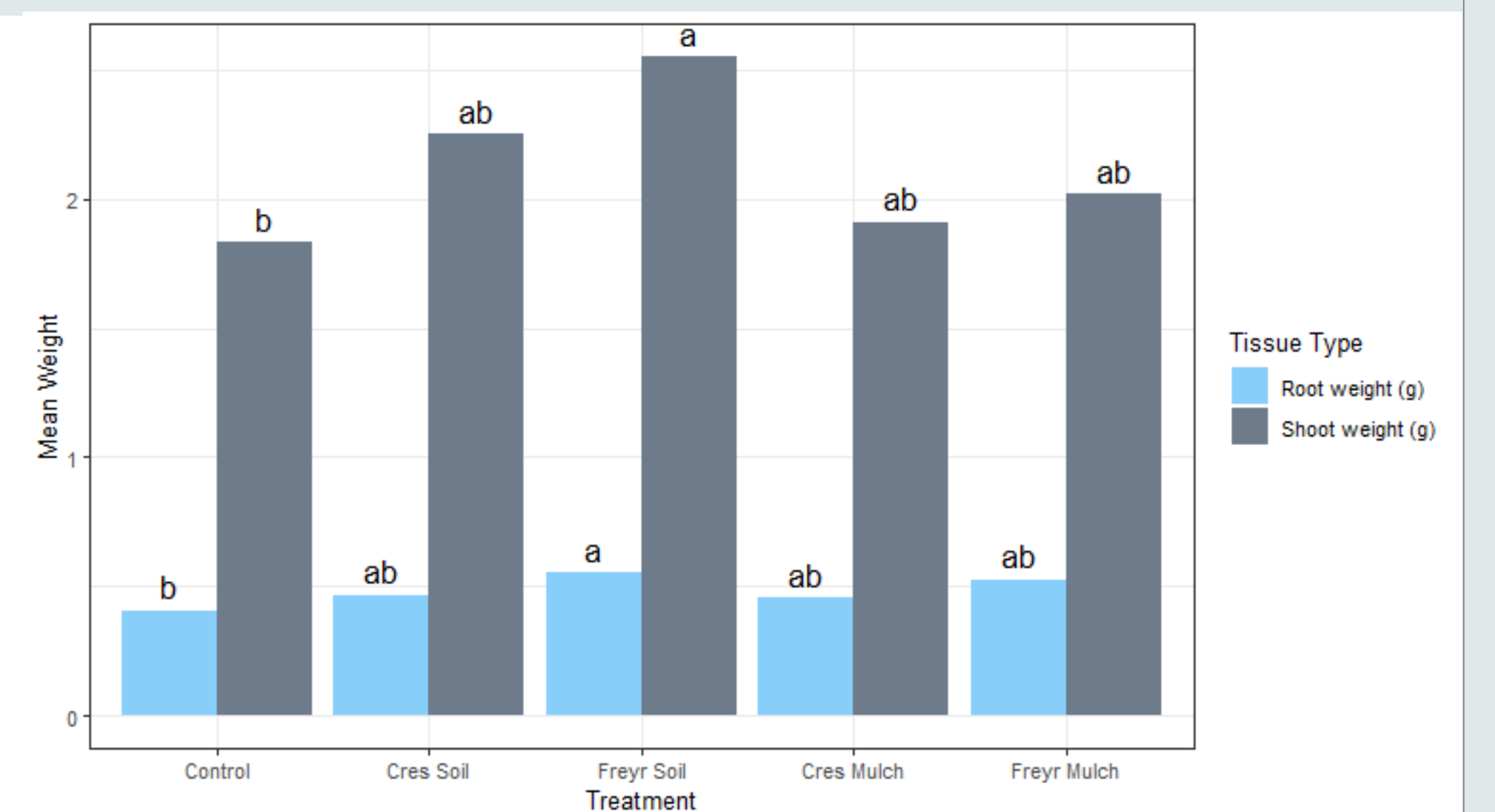


Figure 6. Root and shoot biomass of sugarcane, treated with sunn hemp and inoculated with root-knot nematodes

## RESULTS

### Root-lesion nematodes:

- Control plants had very high nematode populations (400 nems/g of root) with significant differences observed among treatments ( $p < 0.05$ ). (Figure 3.)
- All sunn hemp amended treatments reduced populations to fewer than 5 nematodes/g of root, demonstrating strong suppression.
- Root biomass was elevated in control due to residual soil at harvest. Shoot biomass was lowest in control and consistently higher in sunn hemp treated soil. (Figure 5.)

### Root-knot nematodes:

- Control plants had very high egg numbers (>12000 eggs/g of root), significantly greater than all sunn hemp treatments. (Figure 4.)
- All Freyr treatments in both nematode trials provided stronger nematode suppression results compared with Crescent Sunn.
- Root and shoot biomass were lower in the control treatment compared to sunn hemp treated soil. (Figure 6.)

## CONCLUSION

- Sunn hemp cover crops show potential to be used in an integrated nematode management strategy for the Australian sugar industry.
- The study demonstrated that Crescent Sunn and Freyr cultivars suppress pathogenic nematodes affecting sugarcane under glasshouse conditions.
- Further research is required to confirm the effectiveness of these cultivars under field conditions.
- It is also important to investigate the effects of sunn hemp cultivars on other soil nematodes.
- Also, the residual effects need to be considered, specifically the longevity of sunn hemp's effectiveness in suppressing nematodes in sugarcane soil throughout the crop cycles.