

Inoculation of *Methylobacterium oryzae* CBMB20 reduces stomatal conductance in salt stressed tomato

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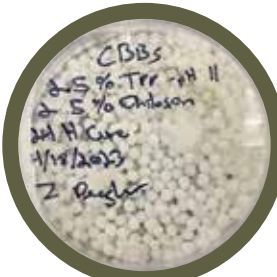
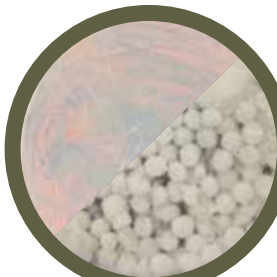
INTRODUCTION

Increasing produce quality without sacrificing yield is a top priority. Hydroponic growing achieves high yield but often at the cost of fruit quality. *Methylobacterium oryzae* is a plant growth promoting bacteria that has been shown to increase plant nutrient uptake, stress tolerance, and photosynthetic efficiency.^{1,2}

METHODS

Tomato cultivar BHN 589 (n=32) were treated with a soil, foliar, combination, or control inoculation of *M. oryzae* upon transplantation and grown semi-hydroponically under high electrical conductivity conditions in a greenhouse for seven months.

TREATMENTS

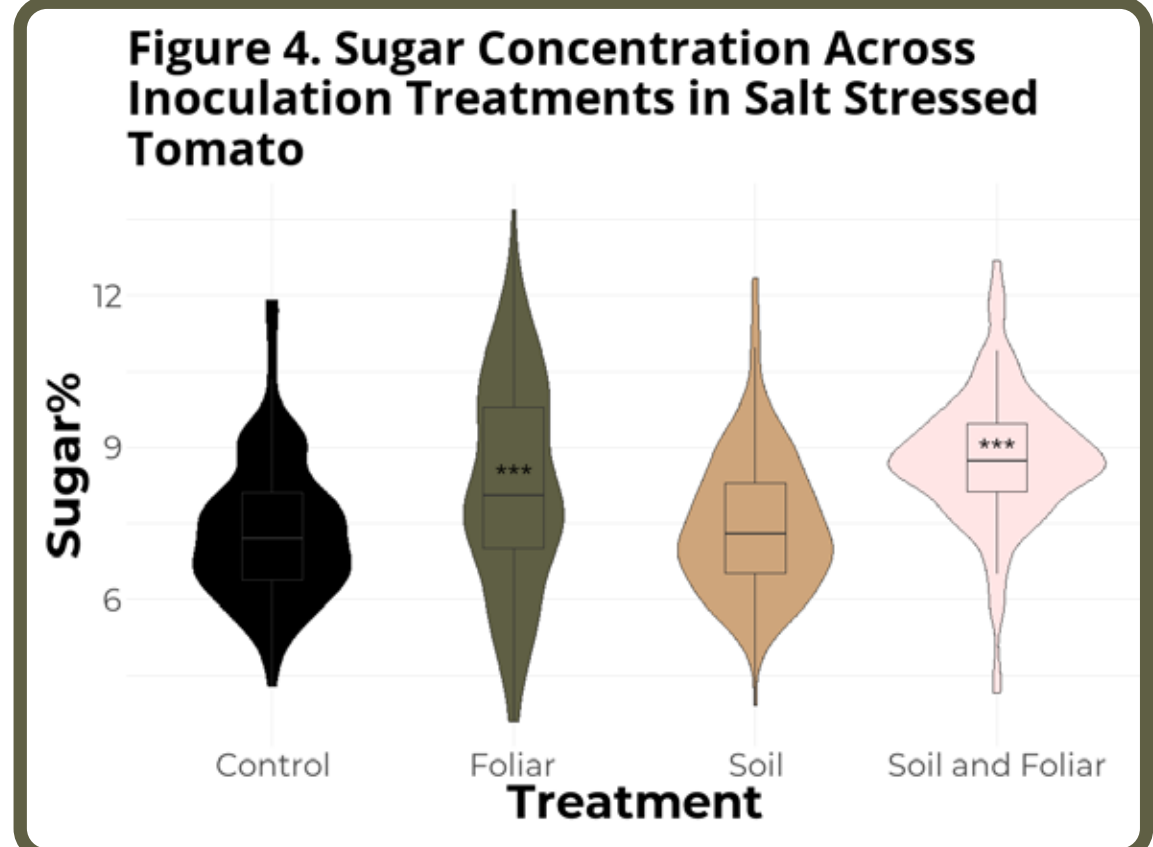
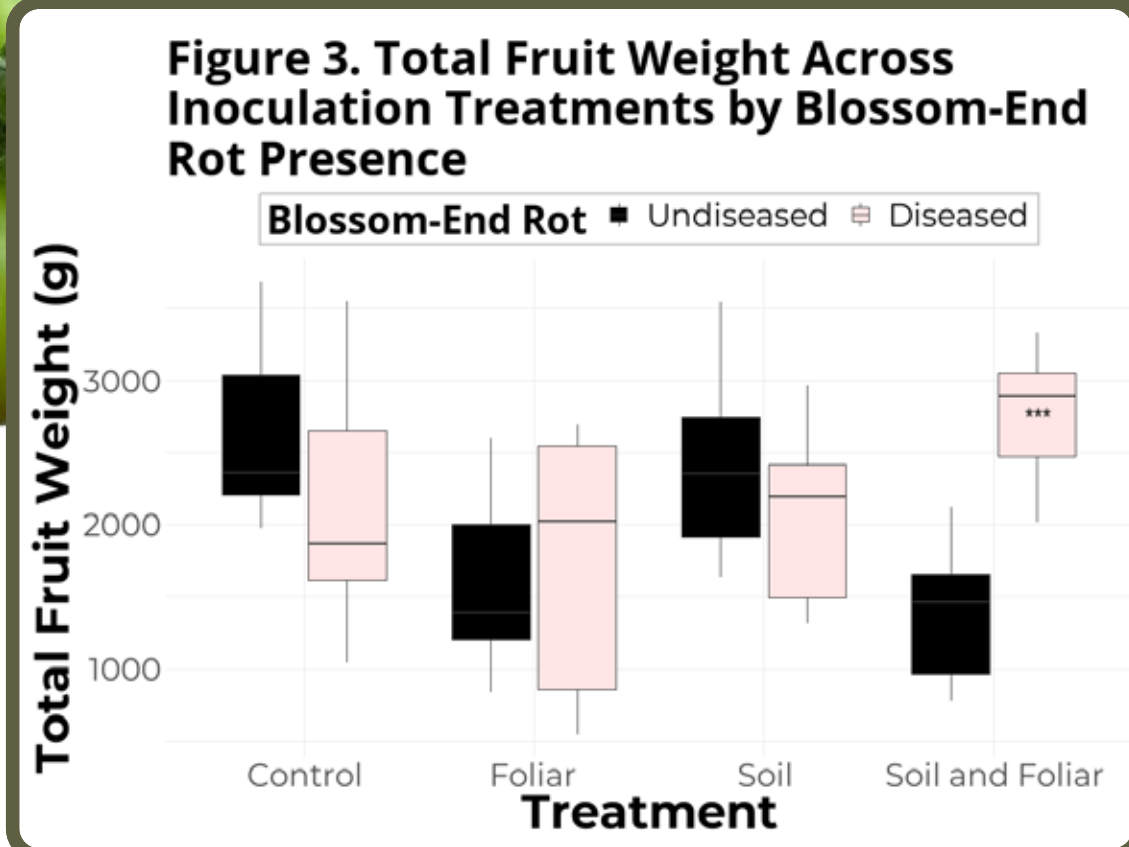
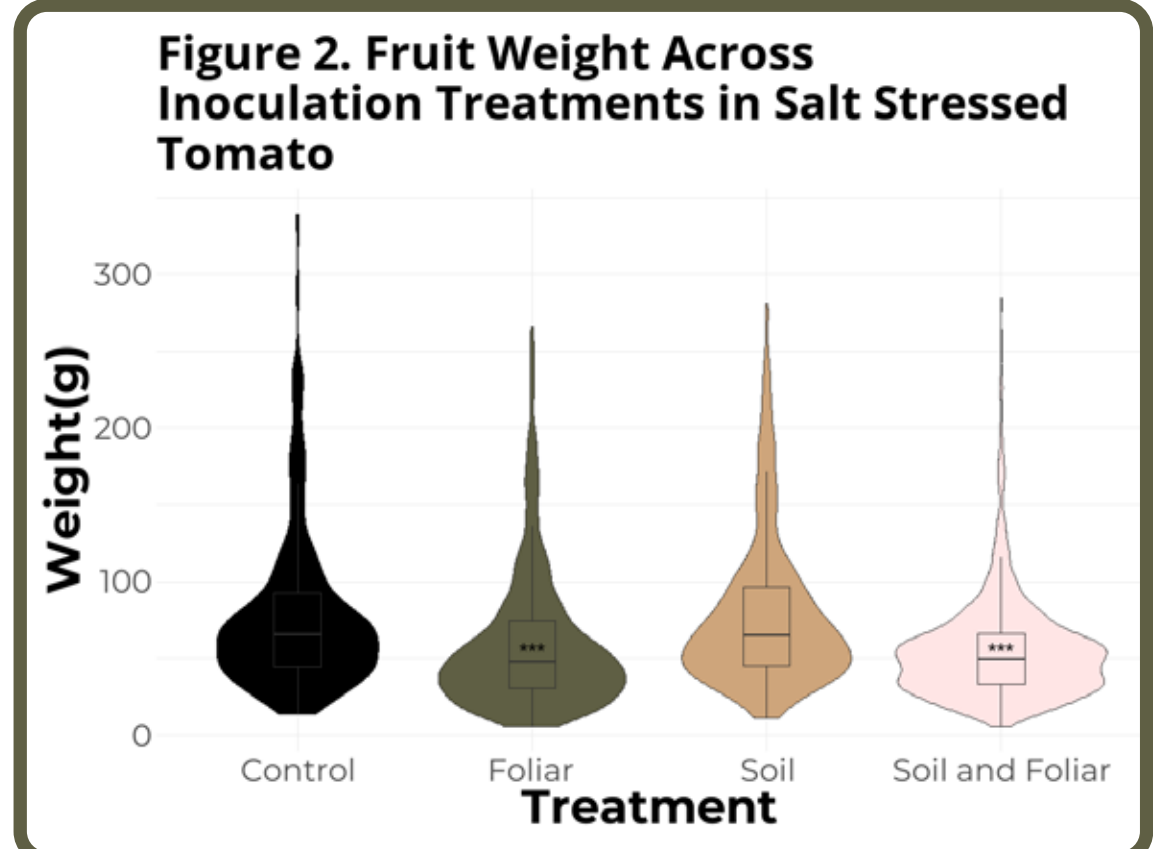
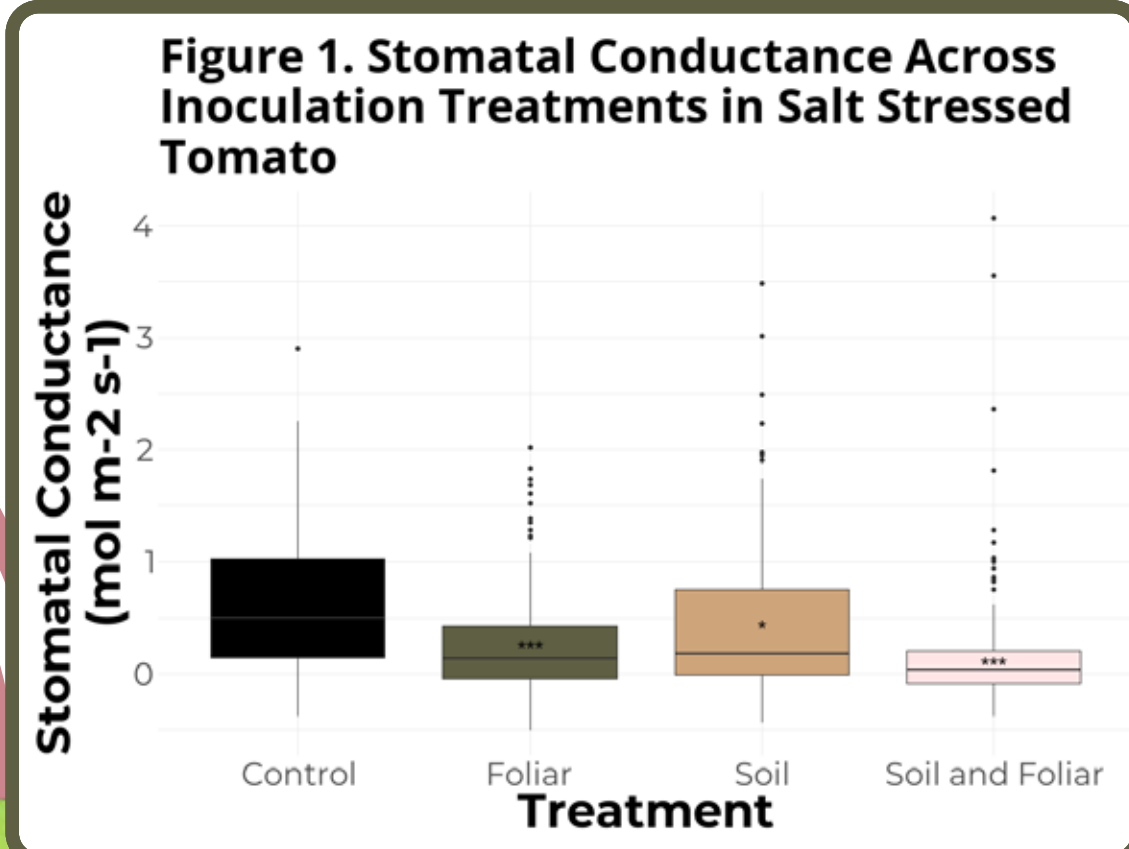
- **Foliar**
Inoculation with a spray of *M. oryzae*
- **Soil**
Inoculation with chitosan- encapsulated *M. oryzae* beads
- **Soil + Foliar**
Inoculated with both methods

DATA COLLECTION

Fluorometric parameters were measured regularly with a Li-COR Li-600 and a PhotosynQ MultispeQ V2. Fruit were harvested upon ripening and assessed for weight, blossom-end rot presensce, and sugar content.



RESULTS



CONCLUSIONS

- Soil Inoculation**
Decreased stomatal conductance
- Foliar Inoculation**
Decreased stomatal conductance
Decreased fruit weight
Decreased fruit yield
Increased fruit sugar content
- Foliar+Soil Inoculation**
Decreased stomatal conductance
Decreased fruit weight
Decreased fruit yield
Increased fruit sugar content

DISCUSSION

These results align with previous results found by the authors showing reduced stomatal conductance in tomato when inoculated with *M. oryzae* under salt stress, but contrast with literature findings that suggest fruit yield should increase when inoculated under salt stress. More data and further analyses are required to shed light on flourescence parameters.

AUTHOR INFORMATION

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REFERENCES

- Lee et al., 2011. *Foliar Colonization and Growth Promotion of Red Pepper (Capsicum annuum L.) by Methylobacterium oryzae CBMB20*. J. Appl. Bio. Chem. 54(2).
- Chanratana et al., 2019. *Physiological response of tomato plant to chitosan-immobilized aggregated Methylobacterium oryzae CBMB20 inoculation under salinity stress*. 3 Biotech 9:397.