

# UNLIKELY RELATIONSHIPS

## Plant Growth Promotion With Fish Waste Microbes

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### Introduction

- Aiding plant growth is becoming more important as climate conditions continue changing in key wildlands and farmlands.
- Future Fresh Farms has created a product from fish waste, addressing this need.
- This study aimed to compare the outcomes of plants grown with MicroRevive, derived from fish waste, against plants grown with other growth promoting bacteria (PGPB).



Figure 1: Experiment setup showing a control group (left) next to a MicroRevive group.

### Methods

- We planted 196 sterilized seeds in 49 sterilized magenta boxes in one part potting mix, one part sand, one part clay.
- One of seven different bacterial treatments were added to each seed.
- After inoculation, we watered every box until the soil was saturated and watered again one week later.

### Germination Rates

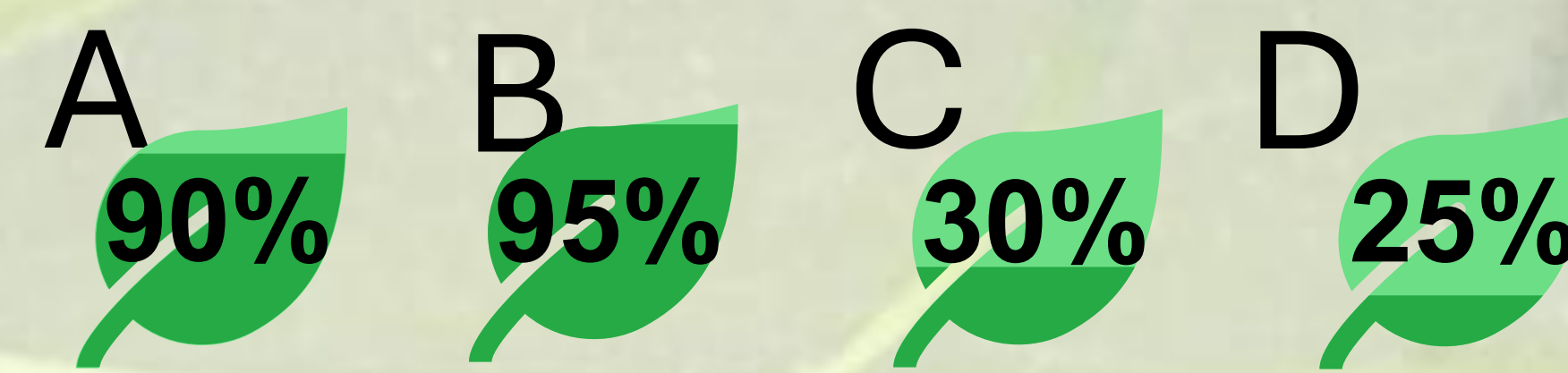


Figure 2: Germination rates of seeds with each treatment – (A) MicroRevive with PGPB (B) MicroRevive without PGPB (C) Only PGPB (D) Controls

### Plant Growth Results



Figure 3: Comparison of the longest plant from each treatment. From left to right – MJAS, MJS, MJ, MAS, MA, MS, M, JS, J, AS, A, S, C (M-MicroRevive, J-Utah Rhizobium, A-Utah Halophilic Bacteria, S-Salt added, C-Control)



Figure 4: Comparison of MAS to MA treatments

### Root Length Results

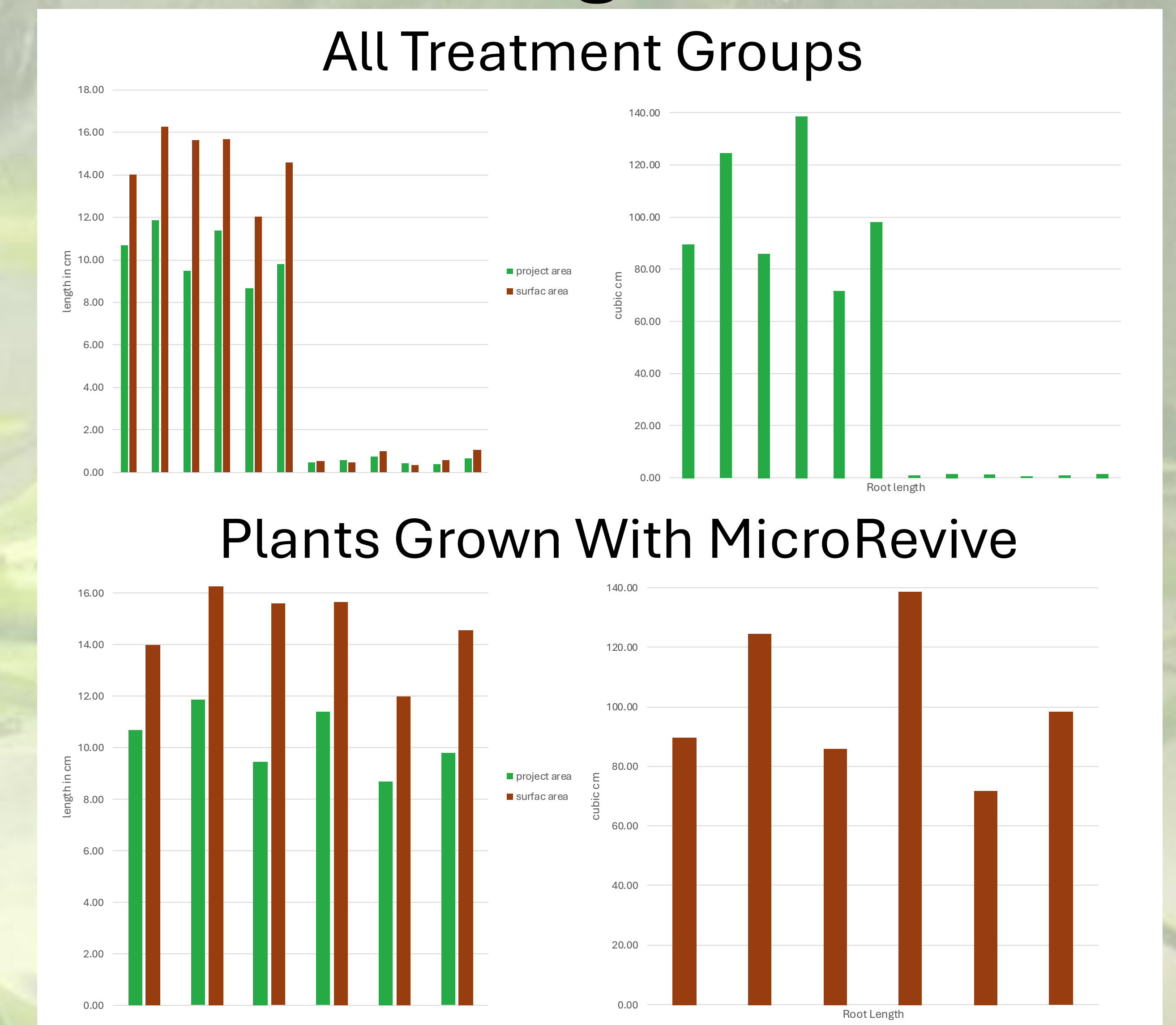


Figure 4: Root length and area compared by MicroRevive, PGPB, salt, and no salt. Top order, same as Figure 3. Bottom order MJS, MJ, MAS, MA, MS, M

### Discussion

Fusarium in the soil inhibited plants without MicroRevive. Fusarium grew 51% less through MicroRevive.

Microbes had a significant affect on plants grown with salt at P=0.064.

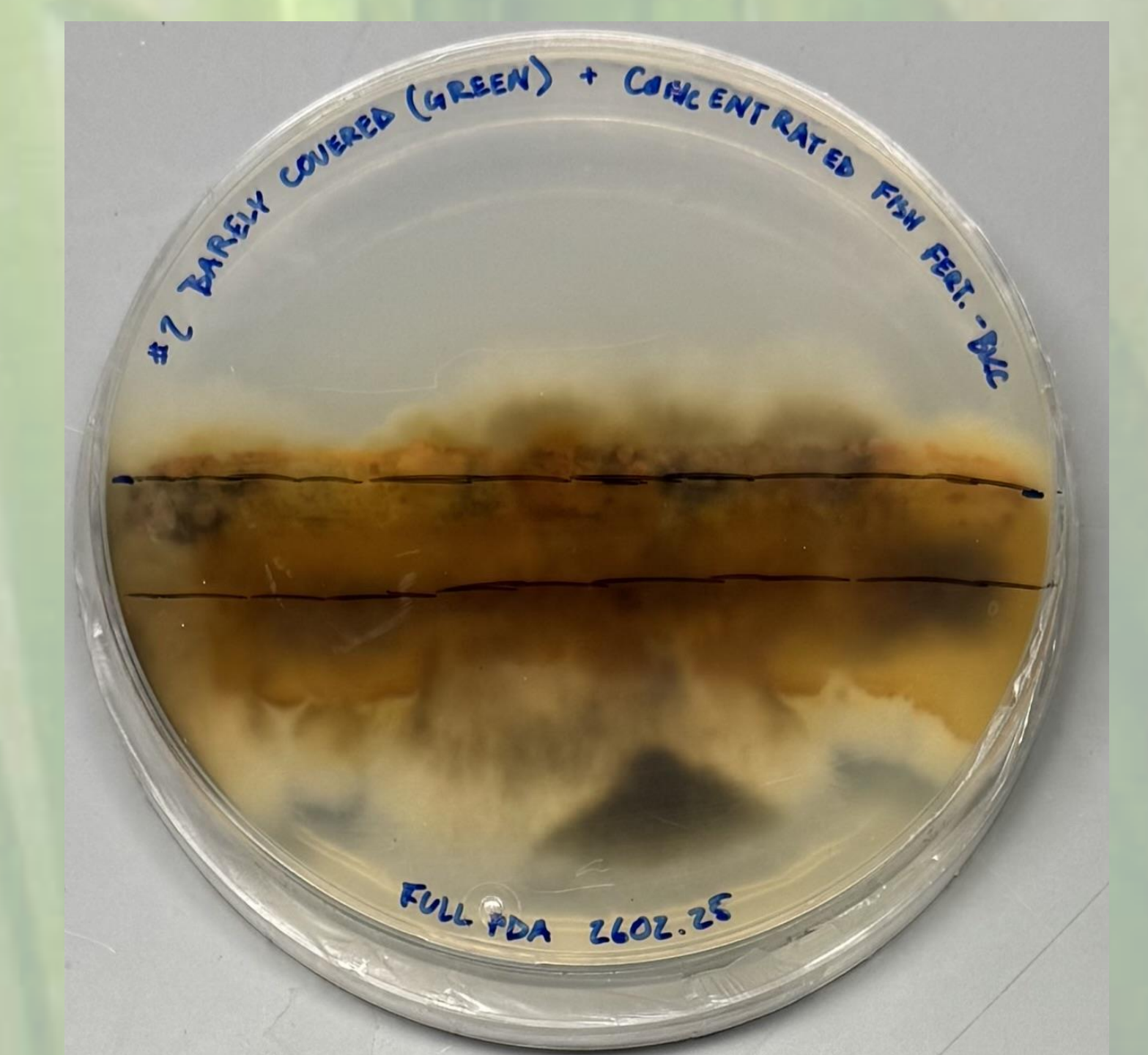


Figure 5: Fusarium and other pathogens grown next to a line of MicroRevive.