

Effects of Biostimulant and Mycorrhizal Inoculant Applications on Dry Direct-Seeded Rice

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INTRODUCTION

- Rice is commonly transplanted in flooded systems for weed suppression.
- Flooded fields emit methane, have a high freshwater requirement, and degrade soil quality.
- Dry direct-seeded rice production systems can be more profitable and less harmful to the environment.
- Biostimulants and mycorrhizal inoculants are marketed to promote rice growth, especially in these alternative systems.

Tested Amendments:

- Mykos Gold:** mycorrhizal inoculant powder, intended to increase water & nutrient uptake
 - Used with **K3NEO Seed Spray:** biostimulant intended to increase fertilizer uptake;
- Yeast Guard:** biostimulant foliar spray intended to increase root systems, tillering, & grain yield;
- Tecamin MAX:** biostimulant foliar spray intended to promote growth by increasing water retention and absorption.

OBJECTIVES

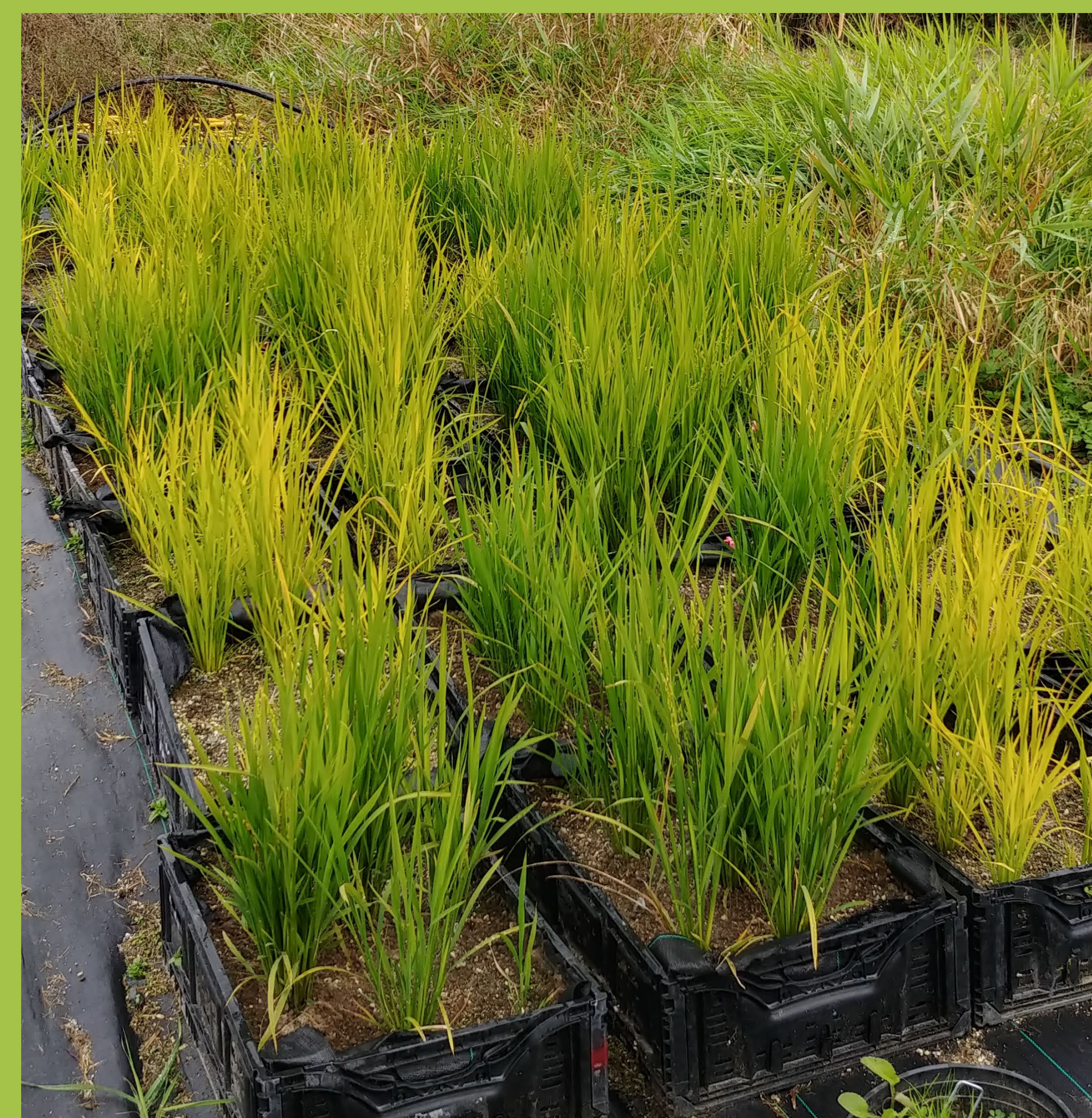
To assess which amendments increase direct-seeded dryland rice growth, measured by root and shoot dry matter accumulation in low and high fertility environments.

METHODS

- Study was conducted in an open area lined with landscape fabric at the KPU Farm
- 32 experimental crates (37 x 56 x 25 cm) lined with landscape fabric
- Growing medium: 50% sand, 23.5% perlite, 23.5% vermiculite, 3% biochar with 3.78 g of Gaia Green 4-4-4 organic fertilizer in each experimental crate



Dryland rice production was enhanced by Gaia Green fertilizer, but not by Mykos Gold, Yeast Guard, or Tecamin MAX biostimulants



METHODS CONT'D

- Completely randomized factorial design with 2 replicates, 4 factors, 2 levels each:
 - Gaia Green: High or low fertility
 - Mykos Gold: +/-
 - Yeast Guard Foliar Spray: +/-
 - Tecamin MAX Foliar Spray: +/-
- Data Collected: Plant count; root and shoot fresh and dry weights

RESULTS

Table 1. ANOVA *p*-values for treatment and 2-way interaction effects on each dependent variable.

	Treatment effect <i>p</i> -value by dependent variable					
	Plant count	Dry weight	Shoot dry weight	Root dry weight	Root:shoot ratio	Weight /plant
Main effects						
Gaia Green fertilizer	ns	0.005**	0.005**	0.009**	ns	0.004**
Mykos gold	ns	ns	ns	ns	ns	ns
Tecamin Max	ns	ns	ns	ns	ns	ns
Yeast Guard	ns	ns	ns	ns	ns	ns
2-way interactions						
Gaia Green * Mykos Gold	ns	ns	ns	ns	ns	ns
Gaia Green * Tecamin Max	0.039*	ns	ns	ns	ns	ns
Gaia Green * Yeast Guard	ns	ns	ns	ns	ns	ns
Mykos Gold * Tecamin Max	ns	ns	ns	ns	ns	ns
Mykos Gold * Yeast Guard	ns	ns	ns	ns	ns	ns
Tecamin Max * Yeast Guard	0.048*	ns	ns	ns	ns	ns

ns = not significant; * *p* < 0.05; ** *p* < 0.01

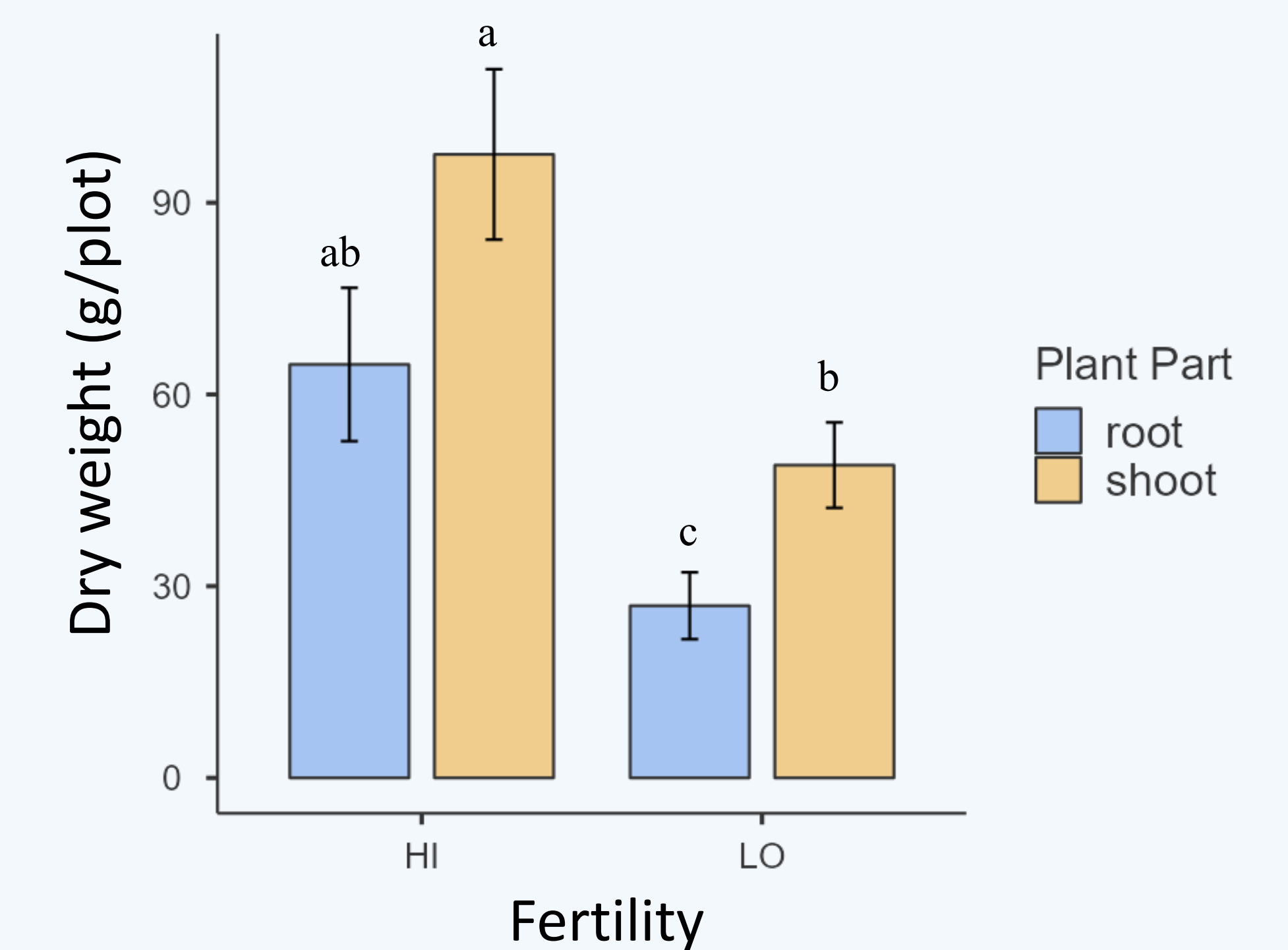


Fig 1. Dry weight (g) of roots and shoots in high and low fertility rice plots. Error bars denote standard error. Bars with same letters do not differ significantly (Tukey test, $\alpha = 0.05$).

CONCLUSION

Rice plants grew better in the higher fertility environments with more Gaia Green fertilizer, but none of the other tested amendments improved growth.

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