

# MYCORRHIZAL SEED TREATMENT IMPROVES YIELD AND HARVEST INDEX IN CORN



Brandon Odam, Robert Johnson, Sushil Thapa  
Department of Agriculture, University of Central Missouri

## INTRODUCTION

- In 2022, about 90 million corn acres were planted in the United States (USDA, 2022).
- Over three million acres were dedicated to corn production in Missouri with an annual on-farm value greater than \$2.2 billion (MU, 2023).
- With the annual decline of agriculture acres being planted in the United States, producers are looking for methods, such as improving their soil biology, to produce higher crop yields.
- Mycorrhizal fungi below the soil surface generate branching filaments that tie into the crop roots and help extracting water and nutrients.

## OBJECTIVES

- To compare the growth and yield of corn treated with mycorrhizal culture to the untreated corn.
- To develop recommendation for corn producers who are looking for ways to improve their crop yields.

## MATERIALS AND METHODS

- Location: Prussing Farm, University of Central Missouri, Warrensburg.
- Planting: April 15, 2022.
- Hybrids: P1197, P1222, P1359 (Pioneer seeds).
- Planting method: Disced, cultivated, 30-inch rows, 32,000 seeds/ac.
- Seed treatment: MycoGold 2 oz/50 lb seed at planting.
- Experimental design: Split-Plot (Stripe-Plot) Design with 4 replications.
- Measurements: The normalized difference vegetation index (NDVI), plant height, biomass, and grain yield.
- Weed management: Post-plant herbicides, Roundup and Atrazine.
- Nutrient management: Plots were applied with P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O each at 40 lb/ac in fall 2021. The field had cover crop cereal rye (*Secale cereale* L.) broadcasted in fall 2021. Corn was top-dressed at 50 lb N/acre.
- Harvesting: September 21, 2022 (5 adjacent plants).

Table 1. Minimum and maximum temperature for corn field period ([www.timeanddate.com](http://www.timeanddate.com)).

Temp/ Precip	April	May	June	July	Aug	Sept
Tmax, °F	85	92	99	100	96	96
Tmin, °F	27	44	56	64	59	42
Precip, In	2.2	6.3	2.6	3.5	2.8	1.2

## RESULTS

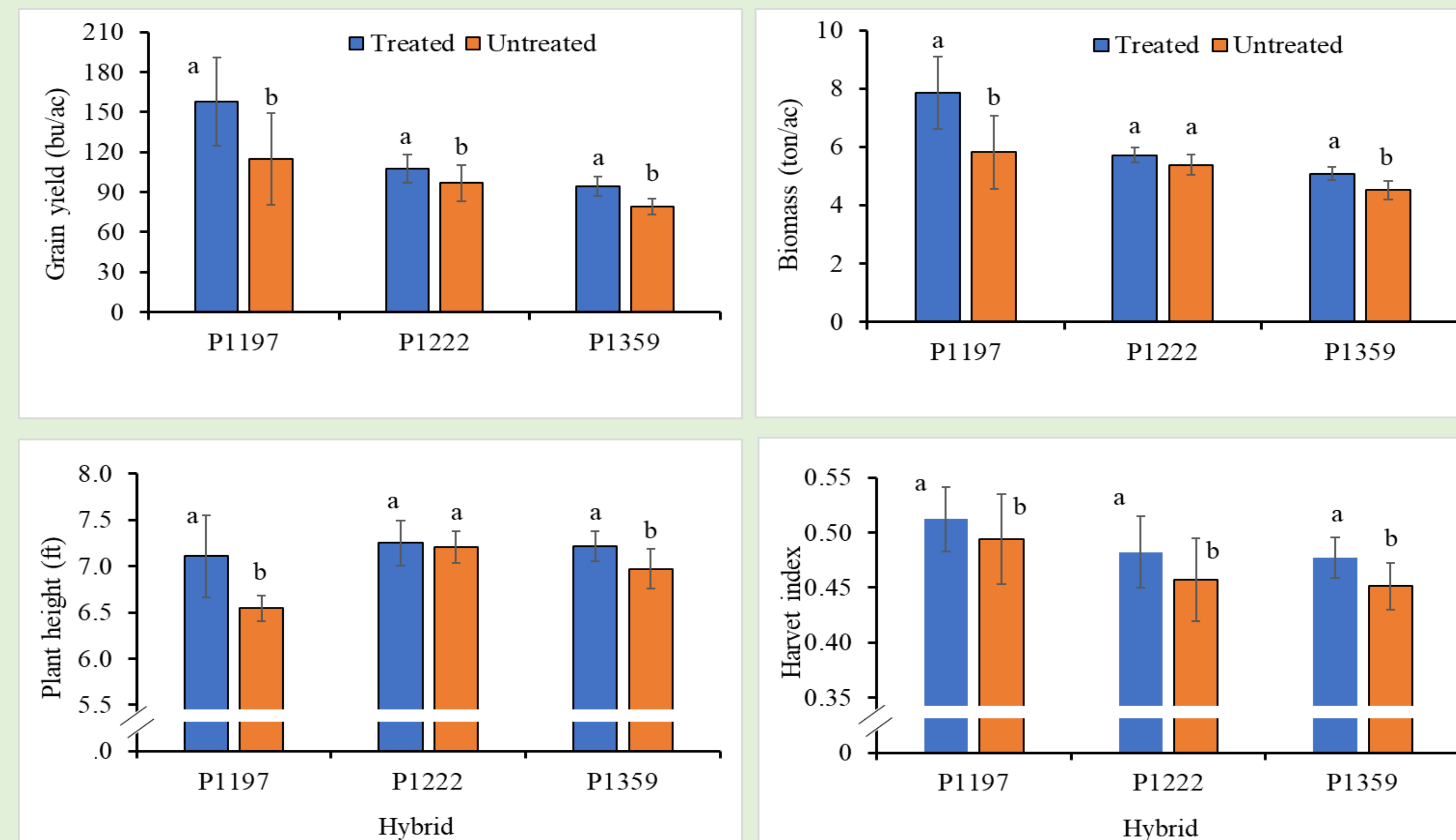


Figure 1. Grain yield, aboveground biomass, plant height, and harvest index for treated and untreated corn. Close bars with different letters are significantly different at p<0.05.

Table 2. Aboveground biomass, grain yield, plant height, and harvest index for different hybrids.

Hybrid	Biomass (ton/ac)	Plant height (ft)	NDVI	Grain yield (bu/ac)	Harvest index
P1197	6.83 a†	6.83 a	0.75 a	136.29 a	0.50 a
P1222	5.55 ab	7.23 a	0.76 a	102.14 b	0.47 b
P1359	4.80 b	7.09 a	0.77 a	86.97 c	0.46 b

†columns with different letters are significantly different at p<0.05.



Figure 2. Measuring NDVI (left) and threshing corn (right).



Figure 3. Treated corn root system (left) vs. untreated corn root system (right).

## SUMMARY

- The treated corn in all three hybrids yielded higher than the untreated corn.
- Along with the yield difference, treated corn also had higher average totals in biomass, plant height, and harvest index.
- Hybrid P1197 outperformed other hybrids (P1222 and P1359) in terms of biomass, grain yield, and harvest index, while there was no difference in plant height among the hybrids.
- Mycorrhizal seed treatment for corn is recommended for growers to achieve greater crop production.

## REFERENCES

- MU, 2023. Corn and Sorghum, University of Missouri Extension. <https://extension.missouri.edu/>
- USDA, 2022. Newsroom-Corn, United States Department of Agriculture. <https://www.nass.usda.gov/Newsroom/>

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