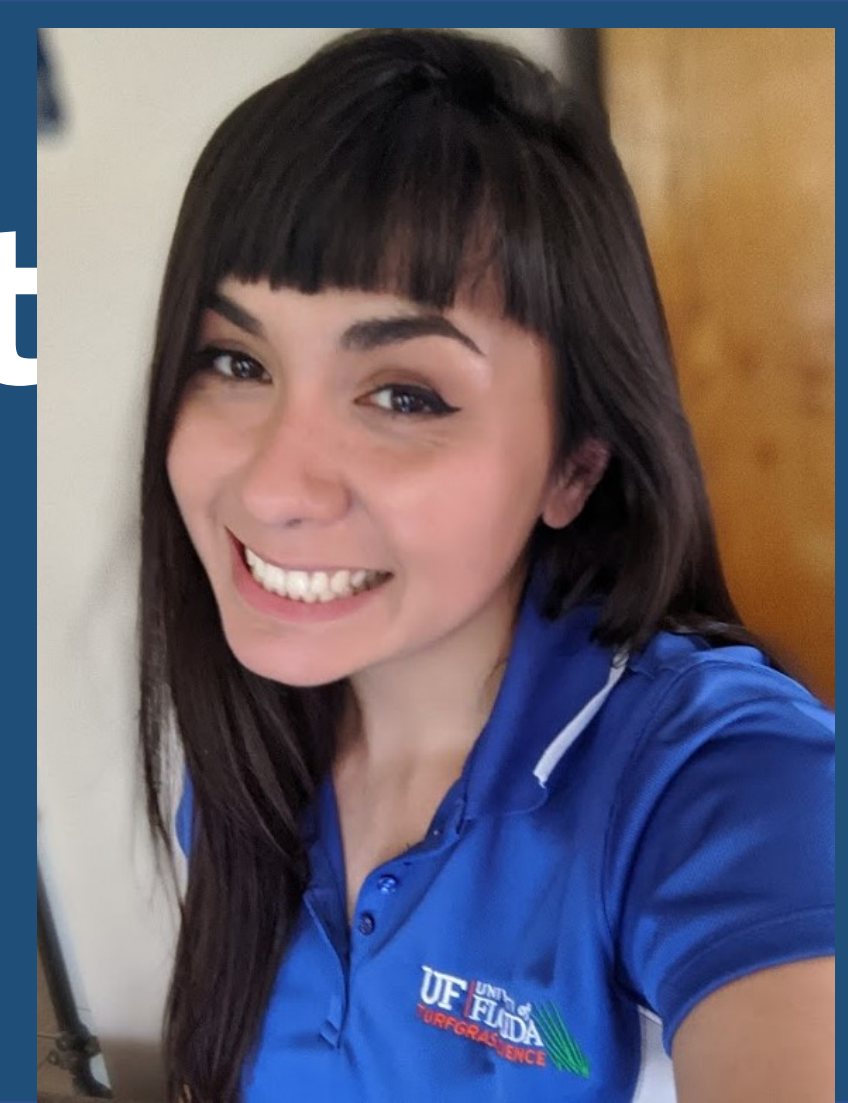


Effects of Commercial Arbuscular Endomycorrhiza Products on the Root to Shoot Ratio and Root Ball Quality of Gaura 'Siskiyou Pink'

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Background

Plant roots form symbiotic associations with various kinds of fungi, known as mycorrhiza. One of the most common forms is arbuscular endomycorrhiza (AM), which is present in around four-fifths of all land plants (Azcon-Aguilar & Barea, 1997). Inoculation with AM fungi can have numerous benefits including increased pathogen resistance, increased abiotic and biotic stress tolerance, improved water and nutrient uptake, and earlier flower and fruiting (Dunn, Leckie, & Singh, 2017; Azcon-Aguilar & Barea, 1997).

Hypothesis

Inoculation of *Oenothera lindheimeri* 'Siskiyou Pink' using multiple species of arbuscular endomycorrhizal fungi following transplant will increase the root:shoot ratio and improve the quality of the root ball.

Introduction

Gaura, *Oenothera lindheimeri*, is a commonly grown greenhouse plant and is popular as an ornamental. The use of AM fungi in floriculture and other horticulture systems has been explored and is considered feasible and rewarding (Azcon-Aguilar & Barea, 1997). This experiment aims to evaluate the effects of commercially available AM products on root growth of *Oenothera lindheimeri* 'Siskiyou Pink'.

Methods

1. Obtain 47 1.5" cuttings of *Oenothera lindheimeri* 'Siskiyou Pink'. Divide into 7 groups.
2. Incorporate the AM product into the planting hole. Half of the experimental group will receive product 1, half will receive product 2. Each treatment will receive the either the recommended rate, 2x, or 1/2x the recommended rate.
3. Transplant the plugs.
4. Collect data, weekly, on height, width, and a second perpendicular width for each plant.
5. After 7 weeks, take final measurements and measure EC and pH. Rate the root ball.
6. Perform destructive sampling to obtain wet and dry root:shoot ratio measurements.

The application of AMF products WOW Wallace Mycorrhizal Inoculant and Mycobloom is not recommended for greenhouse growers of Gaura 'Siskiyou Pink'.



References

- Azcón-Aguilar, C., & Barea, J. (1997). Applying mycorrhiza biotechnology to horticulture: Significance and potentials. *Scientia Horticulturae*, 68(1-4), 1-24. doi:10.1016/s0304-4238(96)00954-5
- Dunn, B., Leckie, R., & Singh, H. (2017, April). *Mycorrhizal Fungi*. Retrieved from Oklahoma State University Extension: <https://extension.okstate.edu/fact-sheets/mycorrhizal-fungi.html>

Results

- The group which received the multiple-species AMF product at 2x the recommended rate, P2R2, had the highest root:shoot ratio, it was 33% higher compared to the control group (Figure 1).
- The highest average root ball rating was in the group which received the single-species AMF product at 1/2 the recommended rate, P1R3 (Table 1).

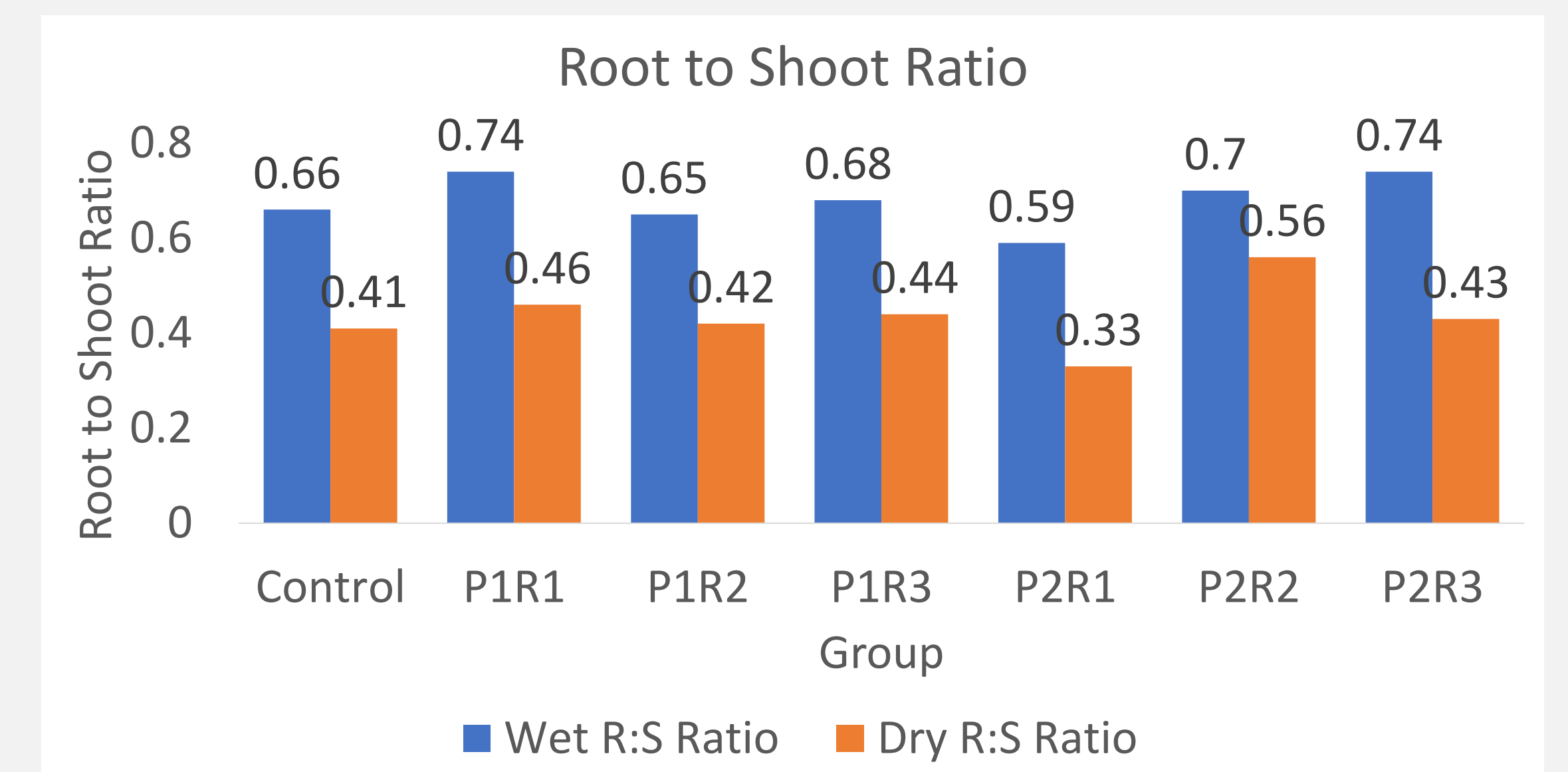


Table 1: Average Root Ball Rating

Group	Average Rating
Control	3.4
P1R1	3.8
P1R2	4
P1R3	4.2
P2R1	3.4
P2R2	2.8
P2R3	2.6

Conclusion

- Inoculation of Gaura using single species and multiple species AMF products did not significantly improve the root ball quality or increase the root to shoot ratio. Five out of six treatment groups saw an increase in shoot and root mass, but the root:shoot ratio remained proportional to the control group.
- The effects on the root to shoot ratio and root ball quality were not as dramatic as expected. Due to the inconsistency in results, application of AMF biotechnology for gaura can not be recommended for growers. Further research to evaluate effects on flowering and plant establishment may be useful.