Evaluating Peat and Coconut Coir-based Growing Media for Kale Seedlings with Biochar, Wool Pellet, and Wollastonite Amendments

Sylka DiBiase
Department of Sustainable Agriculture
Kwantlen Polytechnic University

INTRODUCTION

- Peat is a cheap, yet unsustainable resource widely used in growing media
- Mining peatlands causes oxidation of sequestered carbon into carbon dioxide, a greenhouse gas
- Sustainable alternatives would allow crop growth without environmental harm

OBJECTIVES

- Compare coconut coir to peat as a growing medium base
- Evaluate biochar, wool pellets, and wollastonite as amendments

METHODS

- Completely randomized factorial design with two factors (growing medium and amendment) and three replicates
  - 3 growing media levels (pure peat, pure coir, peat/coir blend)
  - 8 amendments levels (none, biochar, wool, wollastonite and all two and three-way mixtures of these)
- Crop: Kale (cv. 'Black Magic')
- Data collection: Leaf area, dry weight of roots and shoots

Kale seedlings grew better in a blend of peat and coconut coir than in pure peat or coconut coir.

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Michael Bomford and the KPU farm staff for support and guidance in planning and executing this experiment.
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RESULTS

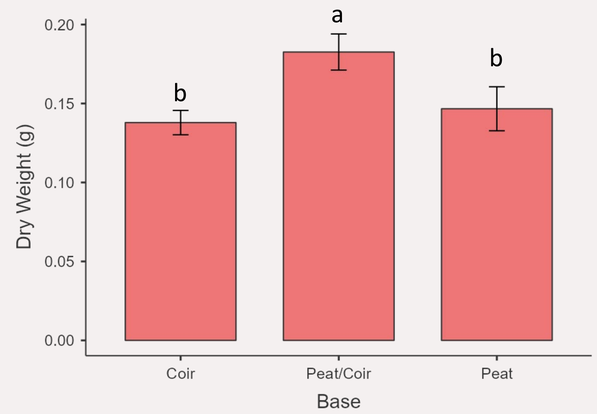

Figure 1. Dry weight of kale seedlings after seven weeks in growing media based on coir, peat, or a blend of peat and coir. Error bars denote standard error. Means labelled with the same letter do not differ significantly (Tukey's test, $p < 0.05$, $n = 24$).

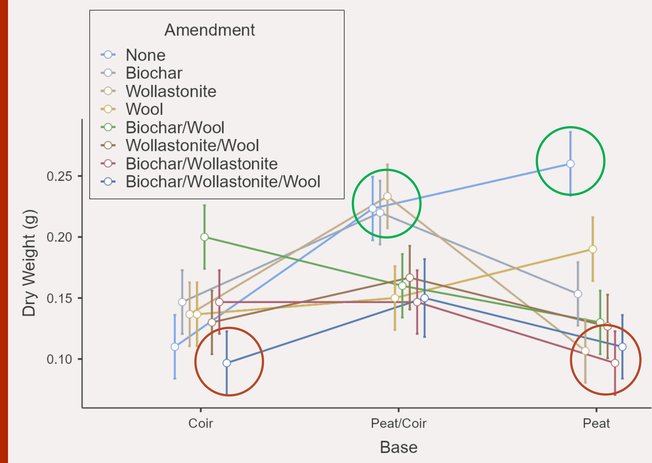

Figure 2. Interaction between base medium and amendment effects on dry weight of kale seedlings after seven weeks. Bars denote standard error. Highest means (inside green circles) are significantly greater than lowest means (inside red circles) (Tukey's test, $\alpha = 0.05$, $n = 3$).

CONCLUSION

- Kale seedlings grew best in media based on a blend of coconut coir and peat
- None of the tested amendments increased growth of kale seedlings
- Biochar and wollastonite amendments did not reduce growth in the peat/coir blend
- Peat can be partially, but not entirely, replaced with coconut coir in growing media without reducing growth.