Interaction between biochar amendment rate and feather meal fertilizer application on cabbage growth

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Introduction

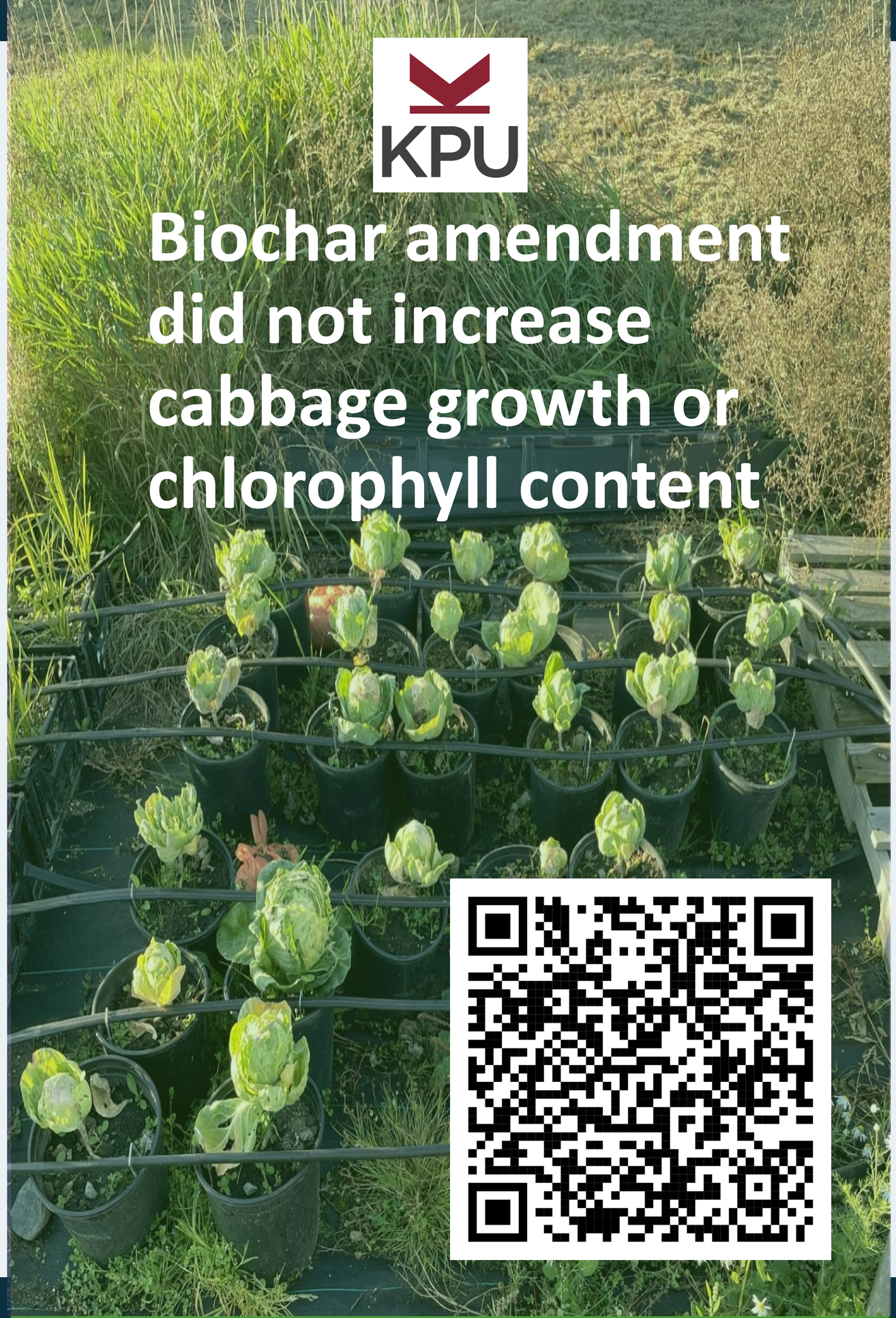
- Biochar is carbon-rich charcoal derived from incomplete combustion in an oxygen-limited environment (pyrolysis)
- Biochar has been used as a soil amendment to improve nutrient and water holding capacity and sequester carbon
- Biochar may enhance low-input vegetable production in nutrient-limited environments, which are common on organic farms

Objectives

- Determine if biochar improves cabbage growth
- Test for any interaction between biochar application rate and soil fertility
- Determine if biochar, with or without feather meal fertilizer, influences cabbage leaf chlorophyll content

Methods

- Randomized complete block factorial design with 5 replicates and 6 treatments
  - 3 levels of biochar (0, 5, 10%)
  - 2 levels of fertility (+/- feather meal)
- Single 2 week-old cabbage seedlings (cv. Tiara) transplanted into each pot and harvested after 13 weeks
- Analyzed by linear regression



Results

- Feather meal fertilizer improved cabbage growth and chlorophyll content (Fig. 1)
- Biochar application rate did not influence cabbage weight or chlorophyll content (Fig. 1)

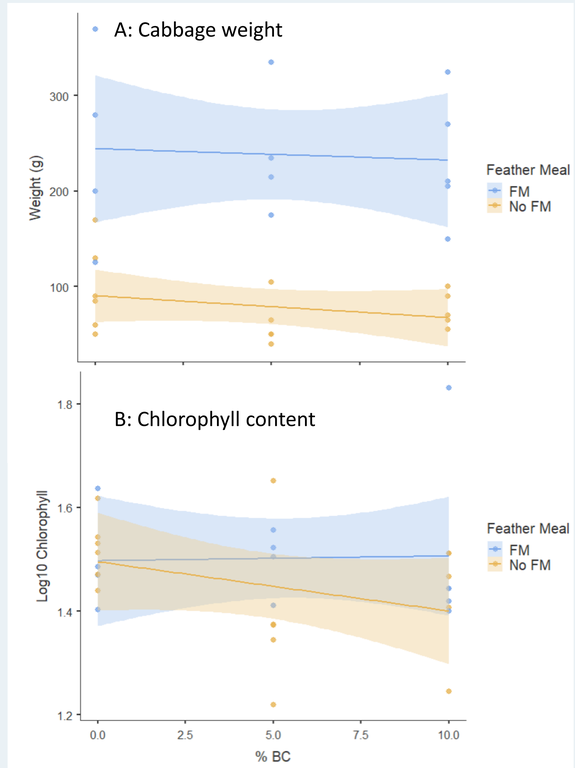


Figure 1. Relationships between biochar application rate (% BC) and cabbage weight (A) or leaf chlorophyll content (B) in unfertilized soil (No FM) or soil fertilized with feather meal (FM). Shaded zones denote standard error around best-fit regression lines.

Discussion

- Feather meal improved overall plant performance but biochar did not. No interaction was detected between these experimental factors.
- Poor cabbage performance in all conditions may have been due to high pest pressure or limited growing area in pots.

Acknowledgements

Thanks to Mike Bomford, Ben Alles, Sahar Zandieh, and Georg Janssen (Preterra Biocarbon Solutions Ltd.)