Effects of Gurbani, Biochar, and Compost on Bush Bean Vigor over Two Generations.

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Introduction

- The **interconnectedness** of air, water, and earth (abiotic and biotic factors), in part, help sustain life on this planet as **understood independently**, in part, through the **scientific** and **spiritual processes**.
- **Compost** is a source of **nutrients** for plants, while **both** compost and biochar, as soil amendments, can **benefit** cation exchange capacity, aeration, water retention, and microbial communities.
- **Phytoacoustics** is the study of the effects of sound on plants. **Gurbani** has **not** yet been **used** as a treatment. Effects of **sound** on **soil** and **water** have been seldomly studied.
- **Enquiry** into this interconnectedness, **by respecting** and **using** both the **scientific** and **spiritual processes**, may allow for a **more holistic understanding** of the reality we live in.

Methods

Generation 1: Beans were arranged in a **completely randomized factorial design** with 16 treatment combinations repeated thrice (n = 48)

- Beans were **planted (02/06/2025)** into pots of mineral soil with the following amendments:
    1. Control (no amendment)
    2. Compost (Anaconda Systems, Burnaby, BC) @ 510.0 g/gal
    3. Biochar (BC Biocarbon, Carrot River, SK) @ 56.7 g/gal
    4. Compost and biochar (rates as above, mixed for two weeks before amendment)
- **Half** of the potted beans were **treated** with **Gurbani** during the **growing season**:
    1. Recorded Gurbani, and Ambient sound, on weekday mornings (47:42 minutes/day)
    2. Irrigation with water exposed to recorded Gurbani and Ambient sound

Generation 2: 8 bean seeds (n = 192) from each surviving parent plant were randomly selected, by a classmate, and arranged in a split-plot design:

1. Whole-plot unit: parent plants (n = 24) and Sub-plot unit: Stress level (high and low)
2. Grown for 10 days in growth camber (21.5 ° C, 77 - 78 % humidity, and 8 hours of light)
3. Shoot and Root lengths were recorded

Compost increases bush bean *vigor* and *survival*; offsprings of Gurbani exposed plants have *stronger response* to *temperature stress*

Results

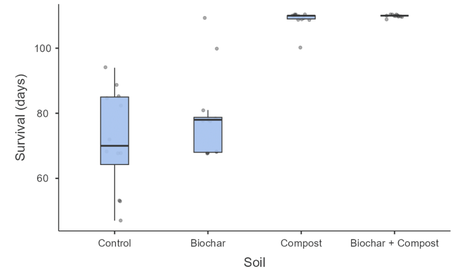

Figure 1. Days survived by generation 1 as affected by soil amendments: control, biochar (56.7g/gal), compost (510.0g/gal), biochar + compost (rates as mentioned and mixed for two weeks before amendment). Experiment was terminated on day 110. Compost vs (control and biochar) was significant ($p < 0.00001$ and $p = 0.00002$, respectively). Biochar + compost vs (control and biochar) was significant ($p < 0.00001$, for both).

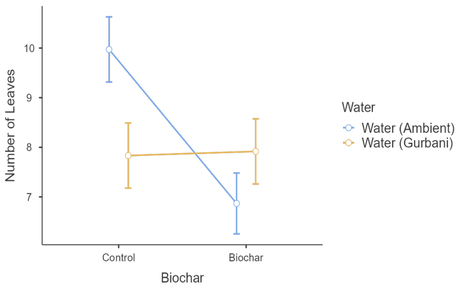

Figure 2. The number of leaves from generation 1 as affected by the following treatments: biochar and water. Water vs (biochar and control) was significant ($p = 0.01454$). Error bars indicate standard error.

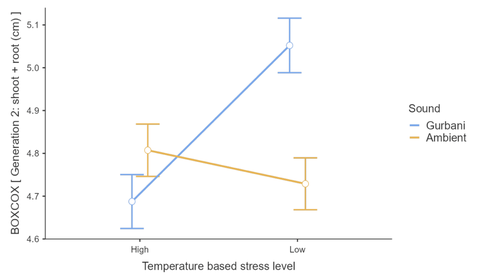

Figure 3. The data was transformed using BOXCOX to conform to the assumptions of homogeneity and normality. The graph depicts the shoot + root lengths (cm) of generation 2 as affected by the following interaction: sound and temperature stress. This interaction was significant ($p = 0.00038$). Error bars indicate standard error.

Acknowledgments

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