

Effects of Partridge Creek Farm Vermicompost on Cannabis Production: An Overview

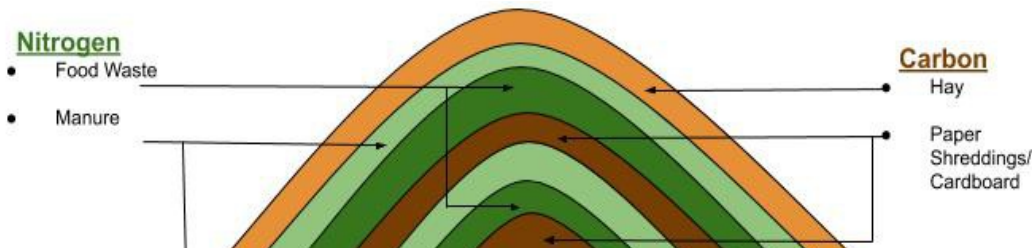
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Objective: To determine which ratio of Partridge Creek Farm's vermicompost has the most positive effect on cannabis plant growth and crop yield.

Methods:

For Compost:

1. Food waste, paper shreddings and cardboard were collected from local businesses tri-weekly.
2. Food waste, paper shreddings and cardboard were deposited into a large pile, manure and hay were added intermittently. The pile was layered as depicted in the graphic below.
3. The pile was let to sit for approximately one and a quarter years.
4. The pile was then mixed and sifted.
5. The sifted compost was put into five gallon bags for sale to consumers.



For Cannabis:

1. Twelve holes were dug with a depth of approximately 37 centimeters and a diameter of approximately 30 centimeters (size of a five gallon bucket).
2. The holes were equidistant from each other as indicated by the graphic below.
3. Partridge creek farm compost was mixed with the dug soil in corresponding ratios then placed back in the hole.

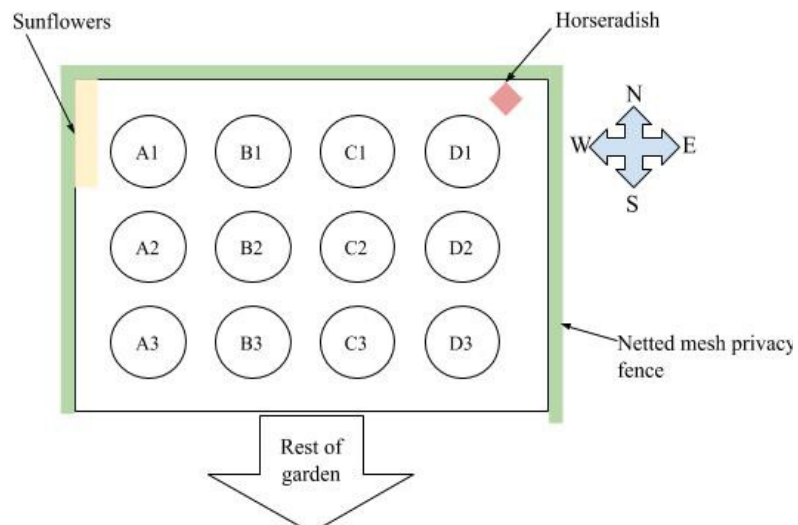
A Group: No compost

B Group: 1:6 Compost:Soil

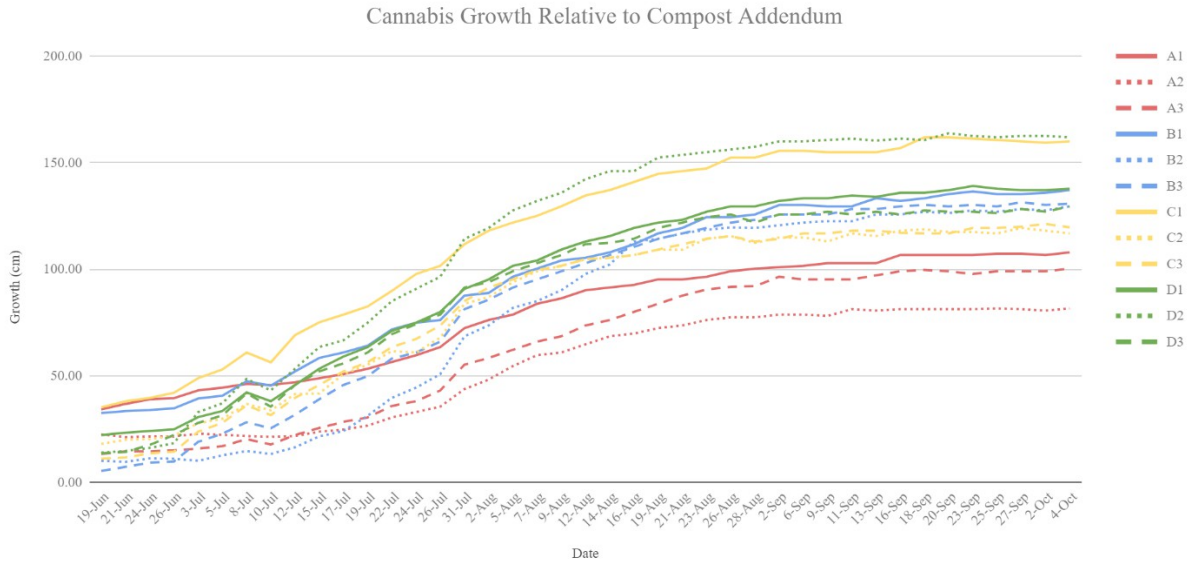
C Group: 1:3 Compost:Soil

D Group: 1:2 Compost:Soil

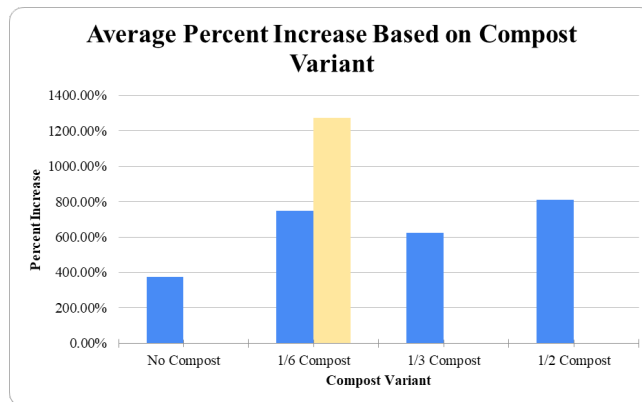
4. Cloned cannabis plants of approximately three weeks of age were planted in the prepared spots. Three different strains were used, one of each strain having a different compost ratio.
 - Group 1: Sunshine Daydream
 - Group 2: Mandarin Dream
 - Group 3: Sunset Sherbert
5. Measurements of plant height were taken thrice weekly until flower buds reached maturity.
6. At maturity the plants were cut and hanged to dry for approximately three weeks.
7. After drying, the plants were trimmed to separate flower bud from stem.
8. The flower bud and stems were then weighed.



Results:

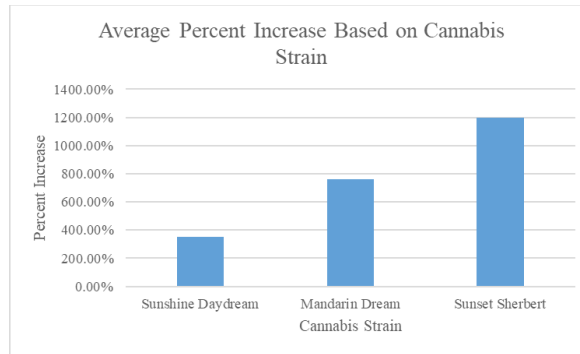


This graph depicts the growth of each plant. Greatest increase in height for all plants occurred in the month of July then steadied for approximately two months. Flowering occurred in late August and early September. Harvesting occurred in October.

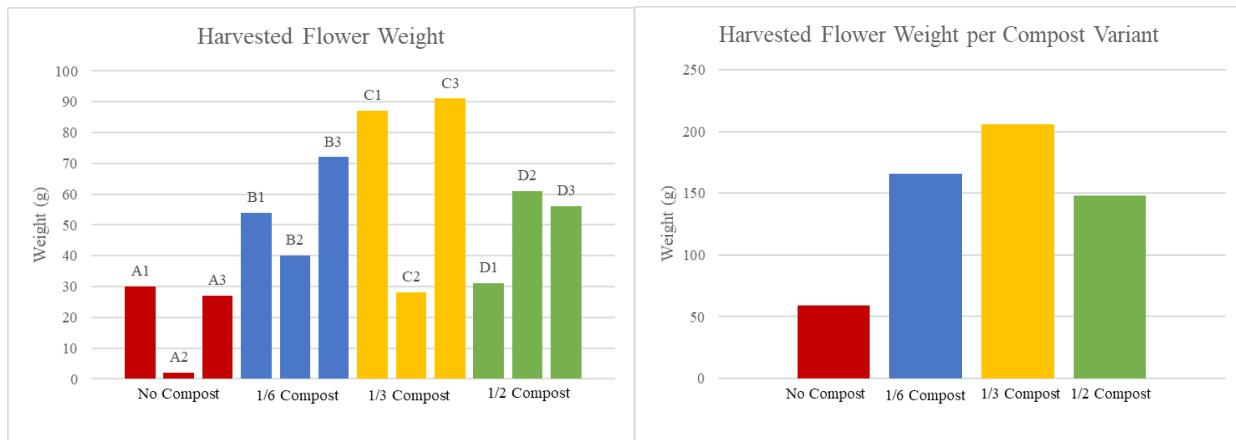


**The yellow value corresponds to percent increase if the measurement of an outlier is taken into account.*

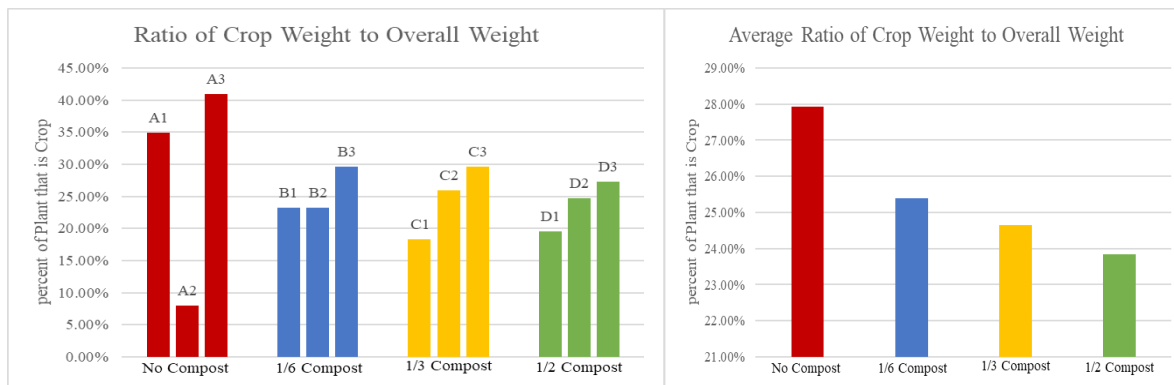
This graph shows that the average percent increase from planted height to harvested height was greatest with the most compost in the soil mixture and least with no compost. Addition of any compost had a positive effect on plant height.



This graph shows that the average percent increase in plant height was impacted by strain, with Sunset Sherbert having the greatest increase. *This could imply that growth rate is impacted by strain as well as compost variant.*

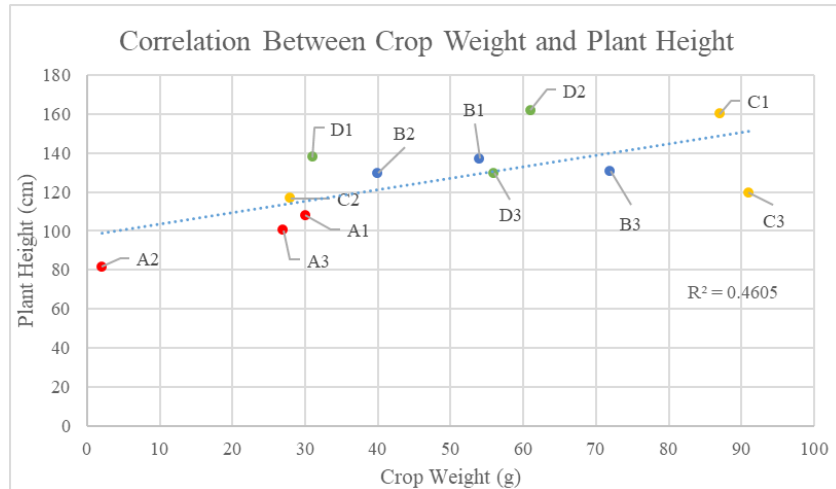


These graphs show the overall weight of bud harvested. The no compost group had a total of 59 grams harvested; the 1/6 compost group had 166 grams harvested; the 1/3 compost group had 206 grams harvested and the 1/2 compost group had 148 grams.



These graphs show the ratio of crop to overall plant weight. The no compost group had an average of 27.93%; the 1/6 compost group had an average of 25.39%; the 1/3 compost group had

an average of 24.64% and the 1/2 compost group had an average of 23.84%. Compost appears to have an overall negative effect on the ratio of bud to overall plant weight.



This graph shows the correlation between crop weight and crop height. The R^2 value of 0.4605 demonstrates that there is seldom correlation between crop yield and overall plant height.

Discussion:

The data suggests that use of Partridge Creek Farm vermicompost had a positive effect on the height of cannabis plants, with the 1/2 compost ratio having the tallest plants. However it was indicated that crop yield was not highly correlated with plant height therefore the application of vermicompost can only guarantee taller plants not a larger crop yield. It cannot be concluded that the 1/3 compost variant had the largest crop yield because of the effect of the compost. The plants regardless of compost variant showed similar average percentages of crop to overall weight (within 4% of each other). It should be noted that the cannabis strain could have had an impact on growth percentages and that the values could be inflated or deflated as a result of each strains ability to cope with the present environment. More testing must be conducted to assure that Partridge Creek Farm vermicompost has a positive effect on cannabis crop yield.

Possible Sources of Error:

- The placement of the plants could have resulted in different amounts of sunlight, effecting growth.
- Other plants within the garden (sunflowers and horseradish) could have been competing with the cannabis plants for nutrients.
- Construction of the mesh fence could have restricted sunlight in areas.
- Each cannabis strain could have had a different adaptability to the environment, skewing the results in favor for different plants.

- As a result of using cannabis clones, the root systems did not go directly into the soil mix but appeared to branch out more. This would have limited the effect of the compost.
- The plants could have been placed too closely together and encroached on each other.

Suggestions for Future Projects:

- Use only one strain of cannabis.
- Have either a larger garden or use less plants.
- Use cannabis seedlings if experiment is conducted in the ground. Use cannabis clones if experiment is conducted in pots.
- Grow indoor as to mimic many of the cannabis producers in the UP.
- Conduct the experiment in a more controlled environment.