

2019MA132B Reckhow Report

Microbial Community Characterization And Pharmaceuticals Analysis Of Agricultural Soils Irrigated With Calcium Hydroxide (lime)-treated Urine From The Grow Food Northampton Community Garden In Florence, Massachusetts

Project Type: **Annual Base Grant**

Project ID: **2019MA134B**

Project PI Name, Position, University and Department:

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Project Impact:

This project explored the potential benefits and effects of using urine treated with calcium hydroxide (lime) as a fertilizer for non-food crops. Urine was treated and collected from the Grow Food Northampton (GFN) community garden in Florence, Massachusetts. The objective of this work was to provide an assessment to the garden management team and the broader community of the effects of fertilizer applications of lime-treated urine on plant growth and the soil microbial community.

Two 7-week agricultural experiments took place at the University of Massachusetts Amherst between Fall 2019 and Fall 2020 using sunflowers as a model species. In both experiments, applications of lime-treated urine diluted 1:10 were found to increase plant growth, including the number of leaves per plant, leaf area, and overall plant biomass. However, in the second experiment, the nutrient “match” increased the number of leaves per plant and leaf area significantly more than the lime-treated urine. We also found that plants treated with the nutrient “match” retained significantly more water in their leaves and had more total chlorophyll compared to plants treated with the lime-treated urine or water alone. However, no differences in photosynthetic efficiency or soil microbial diversity were observed between the exposure groups. The results of this project imply that fertilizer applications of diluted lime-treated urine on non-food crops could increase plant growth without altering the soil microbial community.

Information Transfer: N/A

Products:

1 manuscript to be submitted to a peer-reviewed journal, in prep

Students supported (Number of students, degree pursued, Major):

1 undergraduate student supported, pursuing a B.S. degree from Plant and Soil Sciences