### Introduction

- Understanding the mechanisms behind nitrogen loss in soil through leaching of inorganic nitrogen helps us better understand mechanisms for retention.
- **Hypothesis:** we should see different levels of soil inorganic nitrogen in various agricultural treatments, due to the effects these treatments have on soil microbial communities.
- Fungi use N less efficiently than bacteria
- Fungal-dominated soils should have more inorganic N than bacterial-dominated soils

### Methods

- Five soil samples were taken from three treatment plots for a total of 15 samples.

  - 3E (Legume cover crop)
  - 3W (Non-nitrogen fixing cover crop)
  - SF (Compost)

- 2M KCl solution was then used to extract inorganic nitrogen (N) from samples.
- Soil moisture content was measured.
- Nitrate and Ammonium concentrations were determined colorimetrically through spectrophotometry.
- DNA was extracted from samples and amplified using PCR
- qPCR was used to determine the abundance of bacteria and fungi in soil.

### Results

**Figure 1:** Mean soil moisture in the three treatments. Bars are ± 1 SE.

**Figure 2:** A. Soil nitrate concentrations and B. ammonium concentrations in each treatment.

**Figure 3:** Quantity of bacterial DNA in each treatment. The SF samples had no bacterial DNA.

### Discussion

- The levels of inorganic nitrogen varied widely across the three treatment plots.
- Bacterial concentrations in SF were too low to perform PCR. This is most likely due to the high soil moisture which deprived bacteria of oxygen.
- Fungal microbes were not present at high enough levels for DNA amplification across all treatment plots.

### Future Research

- The same experimental design will be conducted on samples taken in the summer months. This will allow us to see a more robust fungal community and represent a Bacteria:Fungal ratio.
- In future sampling, we can also quantify organic soil nitrogen pools
- We will use 15N tracers to quantify gross fluxes of nitrogen among organic and inorganic pools

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