Background
Mabel's Garden is a sustainable, organic, student-ran garden. This research looked at the impact of a regionally produced, sustainable, soil amendment on soil fertility and earthworm count.

Introduction
One of the growing concerns of farmers is soil fertility. Soil fertility is the ability of soil to grow and support plant life by minerals and nutrients needed for the plants. Healthy soil leads to better yields which lead to more food produced. Traditionally, soil fertility has been maintained with the use of chemical fertilizers. This research looked at an alternative method of increasing soil fertility: the addition of a soil amendment.

Conceptual Framework
Sustainability is something that is important for everyone. Chemical fertilizers can lead to an oversupply of Nitrogen which can make the plants more susceptible to diseases and pests. They can reduce the colonization of bacteria on plant roots and the symbiotic relationships in the soil. Leaching, pollution of water resources, destruction of beneficial organisms, and reduction in soil fertility are all potential side effects of chemical fertilizers (Chen, 2006).

Gardeners are looking for other soil amendments to increase their yield while also avoiding chemical fertilizers. One such alternative to chemical fertilizers is a soil rejuvenator made from organic byproducts. This rejuvenator is comprised of poultry litter, poultry carcasses, and wood products, such as wood chips, and bark chips. The product is then dehydrated and sterilized so that no unwanted insects, seeds, or bacteria are added into the soil. This is free of peat moss, chemicals, and other synthetic materials making it completely organic. The final step in the manufacturing process is to add deactivated beneficial bacteria. When the bacteria come into contact with water, they enter an active state and start to break down organic matter into nutrients that plants need (Rehab Mix, 2018).

Methodology
Ten plots were laid out in an area that no other garden have survived due to the water retention. Initial soil test was obtained. We collected soil from twenty different random locations throughout the chosen area for the garden. The soil was then laid out inside to air dry then sent in for lab analysis. Cardboard and newspaper were then laid down instead of tilling the soil. This preserves the soil health by lowering the potential of erosion. Municipal compost was used as a soil covering on 90% of the plots, 5% used swine compost, and 5% used horse compost. All compost was layered at least four inches deep. On 50% of the plots, three pounds of organic soil rejuvenator were scattered on top of the compost. Four inches of straw waste was placed on top of all of the plots. Soil was allowed to sit for a few weeks to decompose the cardboard and newspaper until seeds were planted in the compost. After the soil settled, Test #2 was collected. Samples were taken from the control and the three test samples. Hay, compost, and cardboard had to be penetrated to reach the soil for the samples. Caution was

needed so that seeds and plants were not uprooted. All samples were laid inside to air dry then sent in for lab analysis. Soil Test #3 will be taken in a new weeks.

Results/Findings

At the first soil test analysis on January 17, 2019, one earthworm was found. At the second soil test analysis on March 14, 2019, nine earthworms were found in the control while 16 earthworms were found in the organic soil rejuvenator. The first soil test analysis is still at the lab but results should be back soon.

Conclusions/Recommendations

An exponential increase in earthworm counts has been recognized. Positive long term effects towards soil health and plant performance is expected to continue as more tests are conducted. Further work is needed to analyze the quantitative soil test data. Further work is planned to look at long term impacts of the soil amendment on soil health and plant performance.

References

Chen, Jen-Hshuan. “The Combined Use of Chemical and Organic Fertilizers and/or Biofertilizer For Crop Growth and Soil Fertility.” 16 Oct. 2006, doi:10.1.1.474.2251.

“Rehab Mix.” *OrganiLock*, 2018, organilock.com/soil-and-hardware/organic-soil-amendments/recharge/.