**Poster Abstract for 2023 Plant Science Symposium**

Global agriculture relies on synthetic nitrogen fertilizer to boost yields to meet the current demand for food. Unfortunately, the average nitrogen-use efficiency (NUE) of maize (Zea mays) is approximately 50%1. Improving the NUE in maize is essential for meeting the growing global food demand and decreasing negative environmental impacts caused by losses of nitrogen fertilizer due to runoff and volatilization. Harnessing the symbiotic relationship between plants and the soil microbiome is one method for decreasing excessive usage of nitrogen and for increasing the NUE of maize. Here we are testing potentially beneficial bacterial species on maize in low nitrogen growth conditions. Based on a previous study2, amplicon sequence variants (ASVs) of soil microbes were identified that may contribute to increasing plant fitness and NUE. These ASVs were matched to 16S sequences in our bacterial culture collection and 64 isolates were identified. We are currently testing the phenotypic effect of these isolates on maize in low nitrogen conditions by measuring changes in growth in the presence of the bacterial isolates. At the end of the initial assay, approximately 15 bacterial isolates will be selected for re-testing. In summary, identifying bacterial isolates that offer positive phenotypic effects in low nitrogen conditions may move us closer to improving NUE in crops, while continuing to meet the global food demand.