

## USE OF SOIL MICROALGAE (*Chlorella vulgaris*, *Chlorella minutissima*, and *Scenedesmus acutus*) TO IMPROVE FERTILIZER NITROGEN AND PHOSPHORUS USE EFFICIENCY IN FLORIDA SOILS

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**Background/Objectives.** Application of synthetic inorganic fertilizers to agricultural land is the primary driver of eutrophication in the Florida everglades and other surface water bodies, resulting in harmful algae blooms (HABs). HABs have become a national threat and have economically impacted Florida. The influence of soil microalgae (ElixEarth) was evaluated on crop yield response, nutrient leaching, soil moisture holding capacity, and soil porosity under field and greenhouse conditions. ElixEarth is a consortium of *Chlorella vulgaris*, *Chlorella minutissima*, and *Scenedesmus acutus*. The objectives of this study were evaluate the effect of ElixEarth in reducing the application rate of inorganic nitrogen fertilizers without reducing crop yield, determine how ElixEarth influences leaching from fertilizer-algae agrosystems, and assess the influence of soil microalgae on soil moisture content and soil porosity.

**Approach/Activities.** Two greenhouse and one field experimental trials were conducted on corn fertilized with urea, ElixEarth, and a mixture of ElixEarth and urea at varying rates (56 kg N/ha, 112 kg N/ha, 168 kg N/ha and 224 kg N/ha). Plant growth parameters were taken during the growing period and at physiological maturity the aboveground biomass was harvested, dried, and weighed.

**Results/Lessons Learned.** The application of ElixEarth and urea at 224 kg N/ha produced the highest biomass yield in the two greenhouse experiments. Reducing fertilize N application rate by 25% did not significantly crop yield when spiked with ElixEarth. Growth parameters of plant height, girth, and number of nodes were not significantly influenced by the application of ElixEarth. N and P leaching were reduced by 10% and 30%, respectively, in treatments spiked with ElixEarth. The application of ElixEarth improved soil water content by 50%.