

Combined biological and chemical pest management in outdoors algal cultivation ponds

Global Algae Innovations

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Algae can provide a new and abundant, renewable feedstock source for affordable, reliable biofuels, bioproducts, and bioenergy that does not compete with existing feedstocks. A major barrier to the scaling and intensification of algae cultivation is the partial or complete loss of productivity due to pests. Cultivation of algae requires active pest management approaches to maintain robust productivity. Crop protection is a significant and complex issue. a holistic approach throughout the cultivation process including everything from biological mechanisms to mechanical/operational strategies.

Global Algae Innovations (Global Algae) utilizes a holistic crop protection strategy with a combination of biological, mechanical, and operational. This strategy prevents system crashes from pests; however, pests are believed to be the cause of some of the unexplained periods of low and high productivity typically observed in cultivation. Furthermore, little is known about the impact and level of effort required for each approach incorporated in the strategy or about the interactions of different approaches in the strategy. The complexity of the microbiome in algae cultivation and the general lack of data on the microbiota composition is the most significant contributor to the current lack of optimization and knowledge about the approaches in the crop protection strategy.

In this project, datasets on the microbiota will be generated and new treatments will be developed to support an improved crop protection strategy that proactively maintains a healthy culture and prevents periods of low productivity. A comprehensive technoeconomic analysis and life cycle analysis model will be to develop a strategy that increase productivity, reduces production costs, and improves the life cycle.

The overall goal of the project is to advance our baseline holistic crop protection strategy to improve the economics, productivity, and reliability of large-scale algae cultivation and provide a sound scientific platform for further advances as well as adaptations to identify and handle new pests that come in the future.