MACRO SYSTEMS

SCALABLE · SURVIVABLE
SUSTAINABLE
PREDICTABLE · PROFITABLE

PROJECT OVERVIEW

MacroSystems is proposing a broad array of innovative solutions to cover the entire seaweed production process, from hatchery to harvesting, including specialized propagation and seeding technologies that would enable large scale seed production, novel and survivable cultivation systems for offshore performance, and remotely operated harvesting machines.

The MacroSystems team, with Ocean Rainforest, Inc. (ORF) as prime contractor, proposes to implement features of a large scale macroalgae cultivation system. The objective of Phase 2 is to de-risk all major cost drivers identified in the Phase 1 Techno Economic Assessment for the Arpa-e mariner program. Our vision is to make macroalgae cultivation a commercially attractive business investment by developing a scalable cultivation system that can survive open ocean conditions, is sustainable, predictable in yield and profitable in operation.

The disruptive cultivation systems developed in MacroSystems will minimize capital and operating expenditures per unit of output by maximizing yields, using scalable cultivation systems that reduce the need for labor and energy, and overcoming nutrient limitations that may diminish farm productivity.

TEAM AND CONTRACTORS

The team consists of a highly experienced group of macroalgae cultivation entrepreneurs and researchers.

OCEAN RAINFOREST
SUSTAINABLE NORDIC SEAWEED

PRIMARY OCEAN

HORTIMARE

ProAssist

Maine Marine Composites

BACKGROUND

- Identified more than 500,000 hectares of suitable space for M. pyrifera cultivation located in the CA Bight
- Designed and tested direct precision specialized seeding aparatus to facilitate high throughput and large scale capabilities
- Engineered and developed a state of the art cultivation system that has been modeled and validated through a finite element analysis
- Completed thorough technoeconomic assessment to identify major drivers and risks

TASKS AND OBJECTIVES

YEAR 1

- Deploy long-lines to de-risk and optimize the horizontal line depth
- Compare effectiveness of the different seeding methodologies used by Category 5 team (i.e. seeding string vs. direct seeding)

YEAR 2

- Determine the best combination of grow line length and grow line spacing
- Test three innovative methods: continuous seeding with glue, propagule seeding, and spot (dots) seeding

YEAR 3

- Harvest biomass at two experimental depths below the surface
- Evaluate difference in yield and regrowth with three and four harvests per year

$4.5 million
Phase I and II

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