

Note on Benefits of Algaculture

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DESCRIPTION

Algaculture is a type of aquaculture in which commercial algae species are cultivated. Algae are often a category of photosynthesis-capable aquatic plant species. Algae are divided into two types: microalgae and macroalgae. Microalgae, also known as microphytes, are microscopic algae that can't be seen with the human eye. They are phytoplankton that may be found in both freshwater and marine environments. They can be found alone or in chains or clusters. Macroalgae, often known as seaweeds, are a polyphyletic category of multicellular algae with varied species that thrive in the littoral zone to a depth in which photosynthesis is possible. Several things must be addressed when cultivating algae and various algae have varied requirements. The water must be at a temperature that is suitable for the algae species being produced. Nutrients must be managed so that algae are not "hungry" and nutrients are not wasted. It's important that the light isn't too bright or too dim.

There are three fundamental systems for growing algae, each with its own set of benefits and drawbacks:

Open pond

Large, shallow ponds are the simplest and most cost-effective approach to raise algae. The water is frequently separated into concentric lanes or raceways, with paddlewheels moving the algae mixture in a circular motion. This aids in bringing algae to the surface, where they can be exposed to light, as well as mixing nutrients and CO₂ into the liquid. When compared to other approaches, the open-pond method yields less algal biomass. Evaporation causes it to lose water, thus more must be added. Contamination by predators or unwanted algae is also possible.

Closed pond

Similar to an open pond, but with the water covered by a Plexiglas greenhouse. This increases the expense but gives you more control over the procedure. It extends the growing season by reducing evaporation and pollution. If the room is heated, growers can raise algae all year.

Biophotoreactor

The Biophotoreactor is a closed device that comprises of glass or acrylic tubes through which algae are exposed to light. Water, fertilizers, and algae are moved through tubes and storage tanks by pumps. When the algae are ready, some reactors harvest them mechanically. This method allows growers the most control over the process and makes algae biomass production the most efficient. It is, however, the most expensive to set up and operate.

Harvesting and processing algae

The alga must be dried after harvesting. Flocculation, centrifugation, and micro-screening are the three main procedures for achieving this. Food elements including omega 3 fatty acids, natural food colorants and dyes, fertilizers, food, bio-plastics, chemical feedstock (raw material), and pharmaceuticals are just a few of the commercial and industrial uses for grown algae. Algal fuel can also help to reduce pollution.

Benefits of algaculture

Microalgae can be used to make biofuels and absorb CO₂ emissions from thermal power plants. Microalgae that can't be seen with the naked eye are being turned into third-generation biofuels by scientists. Seaweed has been used as a fertilizer for generations. It's also a good source of potassium, which is used to make potash and potassium nitrate. Microalgae can also be employed in this way. Agar is made from both microalgae and macroalgae.

Algae can better handle pollutants in effluents and sewage drained into the sea than sewage treatment plants. Algae is enhanced and used as soil conditioners during the fertilizer treatment process. We can also deploy a large basin of water with algae at city crossroads and on highways, as algae controls pollution 20 times better than trees and plants.

Algal biomass is formed through the cultivation of algae, which is seaweed. The biomass generated can be employed in a solid form (dry algae), a liquid form (bio diesel), or a gaseous form (biogas) also called biofuel. Despite being a relatively young sector of

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agriculture, algaculture has the potential to make a significant contribution to future generations' food security, particularly in areas where available farmland is anticipated to be insufficient owing to population growth. Governments should promote

research initiatives on the growth and processing of algae on a large scale, as well as enact laws that encourage its long-term production.