Hawaiian Spirulina & “Certified Organic”

Cyanotech Corporation/Nutrex Hawaii has been cultivating microalgae on the Big Island of Hawaii since 1984. We grow our algae most closely to the way it’s grown in nature, photosynthesizing outdoors utilizing the energy of the sun. For 3.5 billion years Spirulina has grown and thrived in high alkaline salt or soda lakes in Africa and South America. Our outdoor systems provide similar contained ponds for algae to grow, thrive and ultimately offer nutrient dense Spirulina superfood to consumers. 14 out of 16 of the nutrients that we feed our microalgae qualify as organic per the Organic Materials Review Institute list (OMRI).

Over the past 36 years, we have seen organic standards built on terrestrial agriculture practices become less applicable or relevant to algae aquaculture. We believe that organic standards should be developed specifically for algae aquaculture which are cultivated in culture systems that are separate from soil and whose requirements are distinctly different from rooted soil-based plants.

In October of 2005, the USDA National Organic Standards Board (NOSB) ruled that the primary nutrient source for Spirulina production, Chilean Sodium Nitrate, should be limited to 20% of total nitrogen as an input despite it being a non-synthetic natural source. This form of nitrogen is necessary in Spirulina cultivation systems because the microalgae is not a nitrogen fixing organism, and thus needs a high solubility source of nitrogen that sodium nitrate provides.

The objections to Chilean nitrate are twofold: a) in land-based cropping systems mined Sodium Nitrate can leach into soil if it is not completely absorbed by the plant material present in that location and b) a general concern about the mining practices in Chile.

In aquaculture for microalgae, the crop is grown in completely lined and contained culture systems in which there is limited avenue for runoff or leaching. We believe that an exception should be made for closed culture pond aquaculture systems in which the concern for runoff is not present.

With regard to mining practices at the source, the Chilean Ministry of Mining has enacted one of the most stringent and complete environmental mining laws in the Americas (Muniz, 1996) The Chilean nitrate we source is an approved ingredient on the OMRI source list.

The alternatives to Chilean nitrate are biological, not mineral. Compost teas of manures or plants can easily result in high bacterial loads and heavy metals in microalgae products. As stated earlier, in its natural state, Spirulina sources its nitrogen principally from minerals, not composted plant or animal manures.

Regarding sustainability, algae production utilizes carbon dioxide (CO_2) that is recovered, and food grade purified for human consumption. Aquaculture systems perform tremendous carbon capture, through the fixation of CO_2 during the photosynthesis and growth of algae. Annually, our Spirulina system CO_2 conversion efficiency of more than 1 million pounds is 97%. While CO_2 from nonbiological sources is not an NOSB approved input, the environmental benefits of the carbon offset should receive greater recognition.

The Federal USE IT Act supports carbon utilization of this type and is laying the foundation for governmental collaboration in the construction and development of carbon capture, utilization, and sequestration (CCUS) facilities and CO_2 pipelines. The USE IT Act specifically includes CO_2 fixation through photosynthesis of algae. This legislation and the inclusion of algae in the 2018 Farm Bill legitimizes the sustainability of algae aquaculture.

Because algae aquaculture production mitigates global warming, contributes to sustainability, and uses 88% approved natural inputs, we believe that NOSB Organic Standards should be developed specific to microalgae aquaculture.
