

Tomorrow's farmers may take more fruitful dives for crops

11 July 2015, by Nancy Owano



We raise crops on land. Could we do the same underwater? Use the oceans to provide alternative sources of plant production where land is not as kind? Why not? [asked Fast Company](#). "The temperature doesn't fluctuate, so there's no frost. Aphids can't get anywhere near the plants, the pumped-in atmosphere is CO₂-rich. And the plants—apparently—love it."

A number of sites this month have been looking at an underwater greenhouse growing strawberries and other types of food. They are growing off the coast of Italy in a greenhouse 20 feet under water.

Placement off the coast in Italy is able to take advantage of some of the sea's natural properties to grow plants, leveraging constant temperatures and high amounts of carbon dioxide. The structures are described by *The Washington Post* as "balloon-like biospheres" —their shape of the greenhouses allows for water to constantly evaporate and replenish the plants. "What's more, the high amounts of carbon dioxide act like steroids for the plants, making them grow at very rapid rates."

The greenhouse is anchored to the floor of the sea just off the coast of Noli, said Robert Gebelhoff, who covers health and science news for *The Washington Post*. The air of the greenhouse stands at 79 degrees with humidity hovering around 83 percent, he said.

In addition to strawberries, other edibles growing there are basil, lettuce and beans. These biospheres, said *The Washington Post*, are complete with live Web streaming and sensors. They are collecting data realtime on oxygen and [carbon dioxide](#) levels.

Glenn McDonald, writing in *Discovery News*, described the biospheres too. The five structures, he said, "resemble old-fashioned diving bells. Air is trapped under a transparent dome suspended beneath the waves, with rings of shelving along the interior housing soil beds for fruits and vegetables."

This botanical facility is called Nemo's Garden. The project is operated as part of the Ocean Reef Group, a family-run group of two companies based out of San Marcos, California, and Genova, Italy. Sergio Gamberini is CEO of Ocean Reef and head of the Nemo's Garden Project.

With a local government permit, the group is allowed to set up biospheres for four months in a year, from May to September.

What's next: The company has several plans, one of which is to launch a crowdfunding campaign to support further development.

McDonald in *Discovery News* said the group has plans to expand the program with other crops, especially [mushrooms](#), which the researchers anticipate would thrive in the humid environment.



Gebelhoff said. "The company plans to roll out a much smaller aquarium version of the biospheres that people can experiment with in their own homes, with hopes that a broader use of the technology could lead to new insights."

First things first, nonetheless. This is an experimental facility and continued testing and monitoring will provide valuable lessons.

Sergio Gamberini said in *The Washington Post* article, "We want to test first because we want a project that's professional. We want to do this in the right [way](#)."

What is the impact of these structures on ocean life? How can the biospheres and natural ocean creatures interact without harming each other? The biospheres are attracting wildlife, said Gebelhoff. "Octopuses seem to like taking shelter under the structures, and endangered seahorses have gathered beneath the biospheres to develop nurseries. Crabs have also been known to crawl up the anchors and into the greenhouses. So far, none of the animals have posed a threat to the [plants](#)."

More information:

www.facebook.com/NemosGarden/timeline

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