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SPOTLIGHT TOP STORY

Building the better fishbowl: Aquaponics combines fish, greens to create cleaner food

By Jimmy Magahern, Tribune Contributing Writer Jan 28, 2017



LarryMangino

Mesa, Arizona USA. Mesa Community College Peter Conden Director of Sustainable Agriculture and Urban Horticulture with Dr. George Brooks Jr. professor of sustainable agriculture and aquaponics.

Aquaponics is an ancient farming discipline with roots extending back either to Aztec agricultural islands or Far Eastern polycultural farming systems (depending on who you talk to). East Valley eco-innovators are counting on aquaponics to become the next wave in the good food movement.

But can a rag-tag community of sustainability soldiers and survivalists sell greens grown with fish poo to the “Shark Tank”?

George Brooks, an Arizona-born urban agriculture specialist, teaches an aquaponics course at Mesa Community College’s Center for Urban Agriculture and runs NxT Horizon Group, a consulting firm focusing on sustainable food systems.

“Have you ever read ‘Crossing the Chasm’?” asks Brooks, referring to the 1991 marketing textbook by Geoffrey A. Moore that examined the gap between early adopters of innovative new products and the “pragmatists” who typically maintain a more wait-and-see stance.

“Right now, aquaponics is at that chasm, before it makes the jump into the mainstream. We can see the potential on the other side, but in order to get there, there are a lot things that need to be worked out: national and state regulations, cost issues, marketing strategies.

“Someone has to come up with just the right innovation that’s going to make everything work. We’re looking for our Henry Ford or our Steve Jobs right now.”

Brooks, 61, an alumni of the University of Arizona’s College of Agriculture who holds a Ph.D. in Wildlife and Fisheries Conservation and Management, could be poised to become that figure himself. Next month, he plans to release a book, tentatively titled ‘The Three-Hour Farm,’ that he says will instruct any team of four do-it-yourselfers how to build their own backyard aquaponics farm in just three hours. But he’s counting more on one of his young

students to become the Steve Jobs of aquaponics.

"I would love to be that kind of innovator, who'll be able to take aquaponics to the next level," Brooks admits. "But it is going to be somebody who knows 21st century business. You've got to be able to do the 'Shark Tank' thing, you've got to be able to go to a pitch session and woo those investors. That's just the way it works these days."

Problem is, the aquaponics community is a highly fragmented group, comprised of a variety of eco-conscious types that generally steer away from big business sharks: supporters of the local food movement, ecological sustainability soldiers, food justice warriors and even a fair share of post-2012 survivalists still storing up for Armageddon.

Brooks says this fragmentation is particularly evident in the East Valley. Innovators range from Dennis and Danielle McClung, whose backyard "Garden Pool" stands as one of Mesa's longest-running experiments in self-sufficiency, to Mark Rhine, a former electrical contractor who stumbled onto the science of aquaponics and whose Rhibafarms in Chandler now produces pounds of aquaponic lettuce, wheatgrass, veggies and fruit for an impressive roster of Valley restaurants, juice bars and farmer's markets.

"There are people all over the place here who have picked up on this bug and are doing their own things," Brooks says. "But they're all very independent, and there's not a lot of unity. In Tucson, they have a very nice group called the Tucson Aquaponics Project that comes together every month at the University of Arizona. Here, it's all very scattered. The closest thing we have to unity is we do have a Facebook page," he adds, with a laugh. "But that's a start."

Like a comedy skit

The commercial for the AquaFarm, a three-gallon fish bowl topped with a lid for growing potted plants that its inventors call "a self-cleaning fish tank that grows food," pretty much sums up the way aquaponics works—even if the pitch, at times, sounds like some green-techie hipster satire straight out of a "Portlandia" skit.

"The fish feeds the plants, and the plants clean the water," exudes the product's young co-inventor Nikhil Arora, who, with a bro-hug from fellow UC Berkeley grad Alejandro Velez, demonstrates the almost Apple-looking contraption on a stark white kitchen counter.

"The fish, they poo and they pee," says Velez, over an animation of a purple fish dropping pellets in the tank that get drawn up through a tube at the center and absorbed by the floating roots of the plants potted in the lid.

"And all that waste, which normally just builds up in regular aquariums, actually gets pumped up to the grow bed and broken down by the plants into perfect organic fertilizer."

The animation shows the poo in the water disappearing, the plants growing and the fish smiling.

"The clean water just falls right back into the tank."

Fueled by a Kickstarter campaign that surpassed its \$100,000 goal by almost an additional \$200,000, the AquaFarm has become a hit for Arora and Velez's Oakland-based start-up, Back to the Roots, which scored its first smash with a grow-your-own mushroom kit. And thanks to the success of innovations like the AquaFarm, aquaponics is finally getting some mainstream attention.

A curriculum for students

As the science instructional specialist for the Roosevelt School District in South Phoenix, Cassandra Kellaris helped develop a science curriculum for the district that includes frequent field trips to the Roosevelt Center of Sustainability, a retired school turned into a 13,000-square-foot greenhouse just west of the Tempe border.

There, kindergarten through eighth grade students get to experience hands-on lessons in growing healthy greens using soil, hydroponics and aquaponics. But Kellaris says by far the favored gardening method among kids is aquaponics.

"I think with aquaponics, it's just adding the element of live animals to something that's already very interesting, which is watching plants grow and experience creating food," she says.

In addition to organizing the field trips to the Center, Kellaris also partnered on a grant with Mesa Community College to get five cabinet-sized aquaponic systems into the district's classrooms. She says the teachers spend time introducing the young students to a variety of food-growing techniques.

“Both hydroponics and aquaponics are similar in that they don’t use soil,” she says, “The difference is, with hydroponics, you are putting the nutrients directly into the water, and they get filtered through the system that the roots have direct access to in the water. But in aquaponics, the nutrients come from the fish waste.”

That’s the part that always gets the chuckles from the kids.

“They also like composting, and playing with the worms,” Kellaris says. But fish poop is good for more than just a few gross-out jokes.

“There’s actually nitrogen in the waste in the form of ammonia that, with the help of bacteria, gets converted into a form of nitrogen that plants really like called nitrates. So, the fish waste actually becomes really powerful nutrients for the plants, and then the plants picking up those nutrients help filter the water so that clean water is then going back into the fish tank portion of the system.

“All you have to do is feed the fish. It’s sort of a closed ecosystem.”



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