

# Learn To Be An Aquaponics Farmer

In the past couple years, FARM SHOW has published articles about people setting up aquaponics systems for growing fish and vegetables together. Plants get required nutrition from fish grown in water tanks. In turn, plants filter the water and make it safe again for the fish. Here are a couple outfitts that teach the business of aquaponics.

## Friendly Aquaponics

Tim and Suzanne Mann in Hawaii designed and built their own aquaponics system in 2007 and tested 90 different species of vegetables to get information on what grew best, optimum planting densities, and expected production volume. Then they built a fish hatchery and grow-out tanks. By 2010, they had nearly 7,200 sq. ft. of growing area. At the same time, they learned an effective way to breed and raise tilapia to populate their aquaponics tanks and also how to raise Malaysian Giant River Prawns. From that experience, they designed and built a simplified 250 sq. ft. backyard system and a smaller 64 sq. ft. system for people interested in their own aquaponics venture.

In 2008, the Mann's developed a commercial aquaponics training program that provides an intensive 4-day course at their farm. More than a dozen of their students now have aquaponics systems in operation, including 6 commercial systems and 5 that are certified organic. People unable to attend a course at the Mann's farm can purchase a 112-page course manual that includes computer-drawn construction plans, a 47-page construction manual, a day-by-day operations manual, and numerous production tips. These do-it-yourself plans have allowed people in Singapore, Hong Kong, Jamaica, Trinidad, Arizona, Idaho, California, and Kauai to build commercial aquaponics systems of their own.

The Manns now offer their live Hawaii courses twice a year, in October and April,



Suzanne Mann of Friendly Aquaponics holds a huge head of green lettuce grown in the family's aquaponics operation.

and have added a fifth and sixth day to the course to cover building and operating methane biodigesters. They also have 5 day training classes at Randy Campbell's Today's Green Acres Farm in Elora, Tennessee.

Friendly Aquaponics recently designed and built a Micro Aquaponics System that can be 64 or 128 sq. ft. in size. Plans cost \$99.95 for this system, which can be built for under \$700 worth of materials.

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## Aquaponic Austin

"With aquaponics you can grow twice as much food in half the time, using fish to produce organic fertilizer that feeds the growing plants," says Arturo Arrendondo, who hails from the Rio Grande Valley of Texas. "In this system you don't use commercial fertilizers and don't use herbicides or insecticides. It's organic farming without soil. A person can grow food year-around using just a fraction of the water they would use in an irrigated soil operation."

Arrendondo recently organized the Texas Aquaponic Trans Farming Group, an organization that teaches people how to start their own aquaponics venture. He provides informal classes that cover topics such as the different types of aquaponic systems, how different systems fit into different environmental settings, options for fish and plants, daily work requirements with a

system, and harvesting information. Most of his classes have less than a half-dozen people and usually last 2 hrs., so it's a good learning atmosphere for those attending.

After taking one of his classes, Arrendondo says a person can set up and operate his own system. Aquaponics can use different types of fish such as tilapia, bass, perch or crappies. Any of those fish excrete ammonia, which naturally occurring bacteria consume, converting it to nitrites and then nitrates. Leafy green plants, vegetables and tomatoes are commonly grown using aquaponics. With their roots immersed in the nitrogen-rich water, plants grow quickly and produce a bumper crop.

Arrendondo says a typical startup system will cost about \$500 and include a tank, plant trough, pumps, tubing, timers, stones, test equipment and a thermometer. His classes



Roy Viel turned an old 20-ft. wide Deere grain platform into this skid loader-mounted snow blade. "It works just as good as a commercial rig," he says.

## Giant Snow Blade Made From Old Grain Platform

"I made a great snow pusher for my skid steer from an old Deere grain platform," says Roy Viel of Winnebago, Ill. "It works just as good as a commercial rig and I built it for less than a fourth the cost."

Viel started his project by purchasing a retired old 20-ft. wide Deere 220 grain platform. He stripped the reel and auger from the header, and then cut away the metal floor from in front of the sickle bar back to the base of the vertical wall. That left a sturdy 3-ft. tall back frame anchored by a 5-in. tube across the rear of the platform.

"It would've been nice to use the full 20-ft. width for a pusher," says Viel, "but my skid steer was only big enough to handle half that size. To make it work I cut about 5 ft. off each end of the platform, then built new 30 by 36-in. side panels out of 3/8-in. sheet steel." He reinforced the end panels with diagonal braces, which also help support the vertical back section.

To create a smooth surface at the bottom of the pusher Viel welded a 10-ft. piece of 1/2-in. by 5-in. steel to the support tube at the base of the vertical wall. He bolted a 1/2-in. by 6-in. cutting edge to the back wall and

made adjustable skid shoes for each end of the pusher.

Viel uses a universal skid loader plate to attach the pusher to his skid steer. The plate is welded into the opening on the platform that was made for the combine feederhouse. "I had to make some filler pieces because the loader plate wasn't large enough, but the setup worked great when I got it done," Viel says. "Now there's a sturdy metal frame all the way around that platform opening." A sheet of diamond plate that covers the loader plate and fillers along with a pendulum level indicator and a fresh coat of black paint give Viel's big snow moving tool a "factory made" look.

Viel uses the pusher with his Deere 270 skid steer and says it works great. "We had four good size snows in the winter of 2012-2013 and I used it after all of them," Viel says. "The 270 weighs about 5 tons and has 77 hp, so it can easily lift and maneuver the 1,200-lb. pusher. The pusher and the skid steer make a terrific combination."

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cost \$55 for a 2-hr. session. He also does consulting for starting an aquaponics system and charges \$25 per half hour for that service.

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Sweeper Wheels work on power tools like the Stihl Power Sweep (left) and the Stihl Bristle Brush.

driveways."

The stationary Sweeper Wheels are \$105 for a Stihl and \$135 for an Echo, Shindaiwa, Husqvarna and Red Max. Angle brackets for the Stihl setup are \$47.50. Shipping and handling are extra.

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## Wheel Kit For Landscape Sweepers

"Those hand-held power sweepers and bristle brushes that mount on landscape power heads work great, but they take a lot of arm power," says Russ Kempf, a retired engineer who's now a consultant for RCI Engineering in Wisconsin. "I came up with a sweeper wheel kit that takes the arm stress out of using those tools and lets a person get the job done a lot faster."

Russ calls his invention Sweeper Wheels, and they're now available as a kit direct from his company's website, or from a handful of Wisconsin dealers who handle the Stihl Kombi System. "Initially I made the wheels for a Stihl Power Sweep, because that's what my son was using to sweep gravel from his lawn back onto the road," Kempf says. "He has a corner lot and said it took him more than 6 hrs. to clear the grass of gravel from the snowplow."

Russ came to his son's rescue by putting the handheld bristle sweeper on wheels. He designed aluminum brackets that supported the sweeper head and attached 5-in. lawn mower wheels to bracket arms that extend down along each side of the sweeper. The operator pushes the sweeper on the wheels. Raising or lowering the power head can make minor pressure adjustments to the depth of the cut. The brackets also have additional holes to move the wheels and vary the pressure.

"The first time my son used the device it worked like a charm," Russ says. "He told me he was able to clean up gravel in less than half the time without any arm stress. Sweeping is such an easy job now that my son's wife can even help out."

"They make it a lot easier to clean up along driveways, alongside gravel roads and even remove water and light snow from