

Port aquaponics enterprise taking root

Written by KRISTYN HALBIG ZIEHM
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Pat Wilborn searching for sustainable market for fish-fertilized produce

Pat Wilborn stood in his shirtsleeves Monday, surveying the greens growing around him in his Town of Port Washington aquaponics facility.

Four types of lettuce were in various stages on styrofoam slabs in contained pools of water. Several tomato plants, including an heirloom tomato, are producing fruit in a nearby pond, surrounded by watercress and a papyrus plant.

In a nearby room, three tubs are home to the 600 small yellow perch needed to sustain the plants as they grow.



“It’s a young system,” Wilborn said. “It needs to balance out, to mature. It’ll take two, three, maybe four months to mature. “It (aquaponics) is very rewarding, but it’s also very challenging,” he added. “If it weren’t so rewarding”

It’s easy to understand that sentiment when you realize it’s been a five-year journey for Wilborn and his PortFish Ltd., to get to this point.

Back in 2008, he was a lone voice preaching the benefits of aquaponics and seeking

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permission from the City of Port Washington to create an aquaponics facility on the coal dock. It was a way to renew the city's fishing heritage and create an anchor for the downtown, he said.

The concept was so new that Wilborn had to explain to officials what aquaponics is — the marriage of aquaculture, or raising fish, and hydroponics, or growing plants in water.

But the city eschewed his concept for a more recreational focus to the coal dock. Undeterred, Wilborn created a small aquaponics facility at his downtown home.

In late 2009, he and his wife Amy enjoyed their first fish fry from yellow perch they raised via aquaponics.

Two years later, Wilborn received approval from the Town of Port Washington to create his facility in a building he leases off Highway KW, behind the former Port Feed Mill building.

The business is zoned for agricultural use rather than commercial activities.

"We can't process any food," Wilborn explained. "We just gather the goods, put them in containers and take them to where they're going to be processed or sold."

Wilborn uses four bays in the building — a former storage building associated with the feed mill — for his aquaponics operation as well as a 1,500-square-foot greenhouse he erected on the south side of the structure. A thermal curtain traps warm air inside the building, providing a 30% savings on the heating bill, and offering shade.

Vents on one end of the greenhouse and fans on the other kick in when the temperature hits 75 degrees, ensuring the building doesn't get too hot.

One of the bays is home to three tanks of water, each containing 200 small yellow perch. The fish, which are fed by Wilborn, produce waste that is sent to a conversion table in an adjoining bay.

There, one type of microbe consumes the ammonia in the waste and turns it into nitrites. A second microbe converts the nitrites into nitrates that plants can absorb.

The water is then piped into the large pools in the greenhouse, where it provides the medium in which Wilborn's plants grow.

Wilborn starts the plants in his propagation room inside another of the building's bays. There, he plants the seeds for his greens in small plugs, then sets them under lights to begin growing. Once the roots start to peek out from the bottom of the plugs, he hardens the seedlings and moves them to the greenhouse.

The plants are placed on large styrofoam and whiteboard insulation panels that float on the water. The roots grow through large holes in the panels.

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Wilborn has four plant tanks now and plans to add four more in the next several months. A second nitrification table is also in the works.

With aquaponics, Wilborn said, he can extend the growing season year-round.

“With a balanced system, we should be able to produce lettuce in 30 to 35 days,” he said.

Since the system isn’t yet balanced, he added, he’s only producing a crop of lettuce every 60 to 70 days.

Balancing the system can be tricky, Wilborn said.

“I’m not a science person. I’m not a chemistry teacher,” he said. “It’s a matter of waiting for the balance to happen.”

At his home facility, Wilborn noted, the fish overwhelm the system while at the Town of Port facility he needs larger fish to help balance it.

The plants, not the fish, are the main goal of aquaponics, Wilborn added.

“We’re consuming whatever lettuce is coming out, and sharing it with friends,” Wilborn said

In time, he said he would like to expand his aquaponics operation.

“This is not what you would call a money-making operation,” Wilborn said, noting he needs to identify more revenue sources to get larger and produce enough greens to sell them wholesale.

“Nothing is going to happen until I can go to a customer and guarantee them 100 heads a week,” he said.

“We’re just learning the issues involved in producing bulk materials. This could be ratcheted up considerably given the right investment.”

The fish, he added, may never be a commercial crop. It takes a year to 18 months before the fish are of a marketable size, and if he harvests them, he simply has to replace them in the system.

“If I could get \$20 a pound, it might be worth it,” he said, noting the cost of processing the fish is considerable. “At \$14, it’s not.”

And, he added, he will likely be producing about 200 pounds of edible fish each year instead of the 1,000 pounds needed for a commercial operation.

Part of the reason he uses perch for the system is its popularity and the scarcity in the lake, Wilborn said.

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“We could do koi or catfish,” he said. “It could be bluegills or tilapia. We could use goldfish.”

Those fish each require specific changes to the system, Wilborn said, noting that tilapia would require warmer water.

He is considering using some koi, noting he could then sell it for use in backyard ponds, but for now is happy with the perch.

Wilborn said he is moving forward to achieve one of his primary goals, teaching people about the need to know where their food is coming from.

Even with all the challenges he’s faced and the work to come, Wilborn said he’s happy with the way things are going.

“Elated,” he said.

Image Information: AS HE HELD up a tray of lettuce grown in his Town of Port aquaponics facility, Pat Wilborn showed off the way the roots grow into the water, which nourishes the plants. Photo by Sam Arendt