



At the Chicago High School for Agricultural Sciences, the new Urban Agriculture Laboratory, which provides the site for the school's aquaponics system, has a grand opening celebration.

AQUAPONICS OFFERS HIGH SCHOOLERS A HANDS-ON WAY TO LEARN SCIENCE, MATH, AND MORE

WHEN BECKY AND JOHN Waterman decided to donate their aquaponics equipment, they made it their mission to have the most impact and they focused on education. Becky contacted Purdue University and spoke with Andrew Coursey, IISG aquaculture specialist, and an idea was hatched to introduce hands-on aquaponics to interested high schools in Illinois and Indiana.

Through aquaponics, students can learn how to raise and harvest fish and other seafood as well as plants. In this closed system the nutrition in fish waste feeds plants grown hydroponically. The cleaned-up water is then returned to the fish environment.

“Agriculture is expanding and evolving beyond rural farm fields to include controlled indoor environments,” said Coursey. “The more students learn about growing fish or plants for food this way, the better off they will be—they will understand what food systems in the future will be like as well as available jobs.”

Coursey divided the Waterman’s equipment among a few participating schools and helped them get their systems up and running. Paying for the equipment as well as its installation is challenging for schools so when Coursey was able to design and build a system with the donated equipment, it made the difference.

At this point there are six high schools raising fish and, in some cases, plants too, in classrooms, greenhouses,

or other school spaces; equipment sources have grown to include many aquaculture producers in the two states donating what they no longer need.

“Some schools have koi, a very hardy fish, because they want to keep them long term, others grow tilapia because they want to sell their fish at the end of the project to raise money, typically for school programs,” said Coursey. “In terms of plants, sweet basil works really well because it handles a range of temperatures. Lettuce and other produce need more temperature control, which can be difficult in a high school setting.”

It’s useful for students to learn about these growing systems, but aquaponics also offers a hands-on way to learn STEAM—science, technology, engineering, agriculture, and math. To that end, Andy led the development of a curriculum.

The curriculum is 10 lesson plans that comprehensively cover aquaponics, but it is designed so that an educator can pull out a single component to reinforce classwork while connecting to the school’s aquaponic activities, although not necessarily.

“For example, these growing systems provide a really good avenue to learn about water quality and the nitrogen cycle,” said Coursey. “The curriculum illustrates that the nitrogen cycle is important in aquaponics and that it also applies to the natural environment and in fact, how the nitrogen cycle works as a whole planet lifecycle.”

One of the schools that took part in the initial distribution of donated equipment was the Chicago High School for Agricultural Sciences (CHSAS) on the city’s far southwest side. The school’s involvement in aquaponics has grown over the years and now it is a key component of its new Urban Agriculture Laboratory. With a \$25,000 grant, CHSAS rebuilt and upgraded its aquaponics system with help—on many fronts—from Coursey.

“He was the master builder, he planned the plumbing system, and he helped us develop a weekly maintenance plan,” said Noelle Coronado, lead agriculture teacher. “Plus, Andrew provided orientation and training for the new system.”

The school presented Coursey with an Outstanding Partner Award last spring as part of celebrating the opening of the lab.

Managing the aquaponics system will be a focus of a new urban ag course, which will take place right next door to the lab. In addition, several other teachers have incorporated aquaponics curriculum units into their course curricula.

This school year will be the first real test of the new lab with everything in place. The plan is to raise tilapia and perch, and plants such as lettuce, and maybe tomatoes and zucchini.

“If our timeline works, we’d like to have fish fries in the spring, possibly a senior fish fry,” said Coronado. “The lettuce



might be available weekly—for now, the process will be on a trial-and-error basis.” Any funds raised would support the aquaponics program.

While IISG’s work with schools will continue, Coursey is finishing up his last weeks with the program—he has moved to Missouri and new opportunities. He sees his time introducing aquaponics to high school students as very rewarding.

“I grew up fishing—I learned a lot about fish from catching them, from having hands-on access,” he said. “In large metropolitan areas, the kids really don’t have that. To see students light up just interacting with the animals, feeding fish, working directly with plants, that’s where I see the real benefit. The students really love it and I see them directly connect to what I’m teaching them.” 📌

IISG’s Andrew Coursey demonstrates that, in an aquaponics system, basil seedlings grow in water that recirculates from fish tanks.