

A bounty of learning

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Hydroponics provide fresh vegetables, practical experience for students

NUTRITOWER - Dan Sorum has always been looking for ways to further educational opportunities in school. His newest venture, hydroponic towers, are courtesy of several grants. (Star Eagle photo by Jim Lutgens)

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What would you do if you wanted to grow beautiful, fresh produce in your kitchen all year round? You'd get a hydroponic tower. Dan Sorum, ag educator at NRHEG, has done just that for his students this year.

Sorum already helps his students plant the school garden in the spring, but he also wanted to teach students how to grow plants hydroponically. He wrote grants to attain the money to purchase three \$1,100 hydroponic towers for his classes from a company in Ontario, Canada called Nutritower

The company sent along seed packets, which Sorum planted in one of the towers during the first week of school as his "test tower." Growing on that tower now are several plants each of kale, miniature tomatoes and cucumbers, basil and lettuce. "Basically, the idea was to raise this one with the intention of seeing how it works," says Sorum. "The cucumbers do take over a little more than I thought they would, so next time I do cucumbers I'm going to have them in their own tower."

Sorum soon involved the students in the project, and all three towers were up and running.

The full spectrum fluorescent lights toward the inside of the towers provides light for the plants, so lack of sunlight is no problem. Sorum said it was really bright in the room at first when all three towers were lit up, but leafy plants soon began to tone that down.



The plant containers on the towers hold what looks like small rocks, which Sorum says is actually 100% recycled glass, provided by Nutritower. The glass isn't dangerous, and is no problem to work with, according to Sorum, although he noticed that once after using it, his fingers were a little itchy. Sorum tells the students, "Don't handle it any more than you have to." He has them pour the rocks instead of picking them up to put in pots. "I don't want them to get itchy fingers from handling it.

"They send everything," says Sorum of Nutritower. That includes the nutrient packets that Sorum pours in each time he adds tap water to the towers – a twice-weekly task. The tower waters itself automatically via a pump and tubes that flow through each pot.

The seeds don't start out growing in the towers. The seeds are first planted in an absorbent cube, such as an Oasis Horticulture. "If you put water in this cube, it would not put any water out until it was completely full," says Sorum. Once the seeds are planted in cubes, they are put into a tray under a panel of lights. The seedlings grow in the cubes until they are about an inch tall, whereupon the seedlings and the cubes are transferred to pots in the tower. Sorum says he doesn't worry about the plants dying if he has to shut off the water pumps for a day or two. "Because there's enough moisture in that little block to keep them going.

"I'll let them pick what they want to grow," says Sorum of the students who will experiment with hydroponics. "They get to choose. They don't really get to see the end result, because I only have them for a quarter, but they get to have the fun of trying it, and they learn a little bit about hydroponics."

Just like the school gardens, once the hydroponic plants mature and bear, the produce, such as tomatoes and lettuce, will go to the salad bar at the school. There are some plants on the towers though that, according to Sorum, the school probably won't be able to use. Unlike the miniature plant varieties, the basil plants grow large, luscious leaves, but, "They don't really use fresh herbs in the kitchen," says Sorum. "To be able to cook for that many kids with only three cooks, they don't really have the ability to use a lot of fresh herbs." Sorum jokes that no one wants to eat the kale, though he suggests that, given enough hydroponic towers, a restaurant could fill the towers with kale and use the leaves to garnish every plate.

"We'll really get into these things next semester when I have my plant science class," Sorum continues. "We'll probably try some different nutrient levels." Sorum says that one thing people like to experiment with is how much to have the water pumps running in the towers. He has learned from Facebook groups that some tower owners like to have them run for 15 minutes and then turn off for five minutes. What Ph. level to maintain is another question. Hydroponics is a learning process for Sorum as well as the students. "I put the [nutrient] package in and have the pump running all the time," Sorum laughs, but these aspects are things he's looking forward to exploring with his students in the future. With three towers, the classes will be able to do comparison studies, trying different things with each tower.

"The company doesn't sell to schools, really," says Sorum. "They sell to homes. It's got this nice look to it, because they expect it to be in your home. They market to people to have in their kitchen to have access to fresh vegetables and herbs year-round." All the plants on the towers grow edible food. Sorum says by the time the tomato plants are producing, "A person could throw a salad together right there off that tower."

There are a lot of other things one can grow on the towers besides the seed samples that Nutritower provided. "One student is trying some pea plants back there," says Sorum, gesturing toward one of the towers at the back of the classroom. "They're not doing very well, so he's discovering peas don't do well in these towers. But, you know, it's an experiment."

One of the things Sorum wanted to find out with his initial tower experiment was what happened when the roots started growing down the watering tubes, clogging them. "It's natural," says Sorum. "The plant's roots will go down." There is also a filter in the bottom of each pot, and the company warns that the faux "rocks" do produce some dust, so care must be taken to keep the screens unclogged. One student went through an entire tower one day, cleaning out all the filters. "There's a lot of maintenance, and that's what I had to learn with this tower before I had the kids dive in," says Sorum.

Eventually, Sorum would like to have the towers in the high school commons, so people could see them. "But I wanted to make sure I understand them better," he says. There are still questions to be answered. For example, once water is poured into the reservoir, he needs to make sure it stays in the tower. He points out towels around the base of the tower, "Because I have had a couple of overflows," he says.

The towers promise to produce a bounty of learning for Sorum and the students for years to come.