

High School Science Teacher Creates Small R.O. For Schools and Small Producers

By Eric Jenks, for the NYS Maple Foundation

Watching maple sap boil while making maple syrup can provide one with a chance to contemplate life and other philosophical questions, but it is also a time-consuming process that can deter many. Boiling off forty gallons of sap to make one gallon syrup after all isn't an instantaneous process. Like many other small maple producers, Pulaski Academy science teacher Carl Nylen in Pulaski, NY, ran into the problems created by the time commitment needed to make syrup with his students.

“Part of being a science teacher is that I run the science club,” said Nylen. “And during the club we have a maple syrup program where we tap 30-40 trees. I found that after the students left, I was spending countless hours after school boiling. So I wanted to come up with a better way to manage that time more efficiently.”

In researching reverse osmosis (r.o.) machine, which help raise the sugar content of sap by separating out the sugars from the rest of the liquid, Nylen found them to be both expensive, and geared towards larger producers.

For Nylen, cutting down the boiling time was a way to help younger students get hooked on a new aspect of agriculture.

“I've always liked the outdoors, and I think kids need more contact time with the trees,” said Nylen “There aren't a whole lot of outdoor activities and career opportunities for the next generation. Maple syruping is a good way to introduce kids to farming, because in general there are a lot of quick, simple tasks. Tapping is pretty easy and relatively fast, and so is collecting sap. And sugaring is a short season. But then when the kids get into the boiling part of the operation, it takes a lot of time. Usually they're hooked at that point, but that's one reason that I developed the Sap RO Bucket was to cut that time down.”

With the small and portable r.o. that Nylen created and dubbed the Sap RO Bucket, he could increase the sugar content of maple sap from 1% to 8%. The invention is called the Sap RO Bucket because it fits in a 5 gallon bucket.

After three years of making the Sap RO Bucket for friends, Nylen launched his official company The RO Bucket, LLC in April 2018 to serve the hobby and educational markets. “I tell customers that once you have used r.o. sap, that you will never want to put anything but concentrated material in your pan again. I definitely think it’s a game changer for the industry. Having something inexpensive yet capable of increasing productivity makes it so that small producers can be much more competitive with bigger producers. And for hobbyists. it makes it so that you can do what you love while being more economical and efficient.”

The Sap RO Bucket also serves an educational purpose. “There’s a huge market in the educational field,” said Nylen. “A lot of schools have clubs that sugar, or an educational piece on how to separate a homogenous solution. One demo we do is put food coloring in a solution. Pure water comes out on one side, and a darker color on the other.”

Katie Sue Carpenter, Director of the New York Agriculture in the Classroom program recently paired with Nylen on a distance learning project. “Hosting the Virtual Learning Session with Carl Nylen of The RO Bucket was a natural opportunity to provide professional development for teachers and share a tool that will make participation in the annual Ag in the Classroom Schoolyard Sugaring Maple Contest even more engaging and effective,” said Carpenter.

The Schoolyard Sugaring Maple Contest is operated in partnership with the NYS Maple Foundation.

“As a science teacher, Carl was able to explain the scientific principles of reverse osmosis and why it is so important for professional sugarmakers in reducing time and economic inputs,” said Carpenter. “At the same time, the teachers were able to see a practical application of Carl's RO Bucket tool that could easily fit into their Schoolyard Sugaring program. We were very proud to

offer this opportunity for our teachers to grow in their own understanding of maple production, and find opportunities to connect that learning to their students.”

Nylen’s goal with his product was economy for users. “We don’t have an enormous markup for it, because we want to make it easily accessible and affordable for people so that they can put more maple products out there in the world. We also tried to mostly use residential components - just about everything is readily available so they don’t need to come to us if they don’t want to, just head to the hardware store. That’s important if something breaks down in the middle of the season and time is short.”

Going forward, Nylen is looking to expand his product range. “I see maple sugaring as the next micro niche, like micro brewing,” said Nylen. “So we’re trying to roll out a new hobby size product a year, and not just r.o. devices. It’s like with anything, once you start selling you hear from people about what they need, and unfortunately the current infrastructure to meet those needs isn’t affordable for smaller producers. My goal is to help make sure a better maple product reaches the market from everyone, no matter their size.”

For more information on Nylen and his maple industry products, visit www.therobucket.com; learn more about NY Ag in the Classroom program at: www.agclassroom.org/ny/, and the NYS Maple Foundation at www.newyorkmaple.org

For photos of Nylen participating in the Distance Learning event with NY Ag in the Classroom, visit <https://www.dropbox.com/sh/h1vq9x9658qkaih/AABUziYLdvZ-Vwv9t6Ps39mAa?dl=0>