

**A High Density Sugar Orchard for Premature Syrup Production  
Farmer/Grower Grant Final Report  
Project # FNE99-237**

Since I first applied for this grant four years ago, a lot has changed in my life. While the world seemed to be celebrating great economic growth, I seemed to be sinking into greater farm debt. So before the banks could come knocking on my door looking for their money, I decided to get a full-time job off the farm. Maple syrup was the only crop that I did not give up. It has been difficult. After many years of having expanded the number of buckets that I put out, this year I put out only half as many. I've changed the business emphasis from high production of syrup to less production and more education and entertainment via school tours.

The goal of my project was to establish a high density, (700 trees/acre), sugar orchard on my land using wild maple saplings that I've collected. I wanted to do this in a profitable way for the benefit of farmers, who could start making maple syrup in a reasonable amount of time, and to demonstrate this by tapping small diameter trees on my farm.

During the first year of my project I made a pilgrimage to The Uihlein Sugar Maple Field Station in Lake Placid NY. to get advice from Lewis Staats, the leading expert in the breeding, planting and care of high sugar content maple saplings. After a tour of the station, I returned home with 100 "sweeter than average" maple seedlings and one rooted cutting of a 4% maple sapling. These trees, along with 300 wild tree saplings that I collected near my farm, were transplanted to a nursery. The field where the trees would be planted the following spring was cleared of brush and limed. To keep this project perpetuating, I planted two pounds of sugar maple seed in the nursery for the crop to be planted ten years from now.

The following spring, the field was laid out with the rows eight feet apart. Spacings in the row were planted one tree at a time. As I jumped on the shovel for the first hole I hit my first obstacle, literally, as the field was full of rocks and roots and not suitable for the use of hand tools. Consequently I got out my backhoe to dig the holes. As the bucket pulled the first scoop of dirt from the hole the roots were so thick that it peeled back like a thick carpet, and I realized that there would be no loose dirt to back fill in the holes. Then, I got my dump truck and fill it with topsoil, which I just happened to have in a pile, and I trucked the soil to the site before the first tree was planted. Spacing between trees was done with the length of a 2x4x8' and was then marked with a survey flag. When the backhoe hit ledge or rocks too big to dig the whole row was moved down in order to keep the proper spacing. Even digging the maple saplings out of the nursery was done with the backhoe. After only one year in the nursery, the trees had grown a massive amount of feeder roots and did not dig easily. The trees were transported to the site, bare root, in large blue barrels full of water. The trees were planted 8'x8' as much as the rocks would allow. Soil that was trucked in was wheelbarreled to each hole for back fill. The sweet trees from NY. were not planted at this time due to their small size and they were allowed to stay in the nursery until they grew bigger. Therefore skips were left on a grid of 40'x40' for the future planting of sweet trees, for they will be the final crop trees left standing after the final thinning which will take place thirty to forty years from now.

Last year the backhoe needed major repairs, so no trees were planted in the field. The season for transplanting trees in the spring time is short in between the time spent making maple syrup and the time the trees start to grow. Therefore, my time was spent digging wild saplings of all sizes and planting them in the nursery. This year, even less of my time has been spent on this



project. My new job has me working 50 hours a week, leaving little time for family, farm or rest. Seed that was planted during the first year was now ready for transplanting and was graded by size and then replanted in the nursery. A hundred more wild saplings were added to the nursery. Although the trees that were planted in the field did survive planting, some trees have died due to deer rubs. Some trees that lived through the rubs have snapped off in high winds. There have also been some trees that have died back to the ground and then started to sprout again. Originally, I had budgeted \$3.00 per tree as the cost for digging wild trees, replanting them in the nursery, and replanting them to the field, but in actuality, when I factor in the cost of the backhoe, the cost was \$10.00 per tree. I wanted to prove my theory of high density regardless of the cost. Perhaps someone planting an abandoned hayfield could do it cheaper.

Part 2 of my project was to demonstrate that sap production of small trees is possible by tapping existing trees of small diameter in the wild. The goal was to get one gallon of sap per season on a two inch tree. During the first year, I tapped a three inch diameter tree and over the course of the season it produced five gallons of sap. During the next two seasons, I tapped a two inch and a four inch diameter tree, and neither produced more than a cup of sap each year. However, the last two seasons have been poor production seasons any way. I can't explain why the first year was so successful compared to the other two.

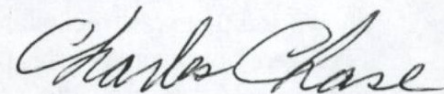
My plan to plant large trees, six feet tall, in the field to avoid the problem of deer browsing, was only replaced by the problem of deer rubs. To lower the high cost of planting trees with the use of a backhoe would mean using smaller twelve inches high trees, and a spade. It would also mean another ten to fifteen years of growth in the field instead of in the nursery. The need for tree shelters to avoid rubs and browsing only drives the cost of planting even higher.

My conclusions based on my experience of planting maple trees is that it is not feasible to spend so much time and money to plant trees at such a high density (700 trees/ acre) for the purpose of tapping small diameter trees. However, there must be a half way point better suited than the traditional 50 trees/ acre and a forty year wait to reach ten inches in diameter.

My future plans are to continue to collect wild saplings to grow in the nursery and to plant them on my land. I plan to space them at different densities from 50 per acre to three hundred per acre. I might even try interplanting them with Christmas trees to use as a nurse crop to off-set the cost. I hope to experiment with cheaper ways of keeping the deer away.

My outreach program has not been organized yet. Perhaps my advisor could organize a farm tour in the future. My project is on going, and the earliest there will be any tapping is five more years. I hope to write an article as to my planting experience for trade magazines.

Respectfully Submitted,  
Charles Chase June 1, 2002







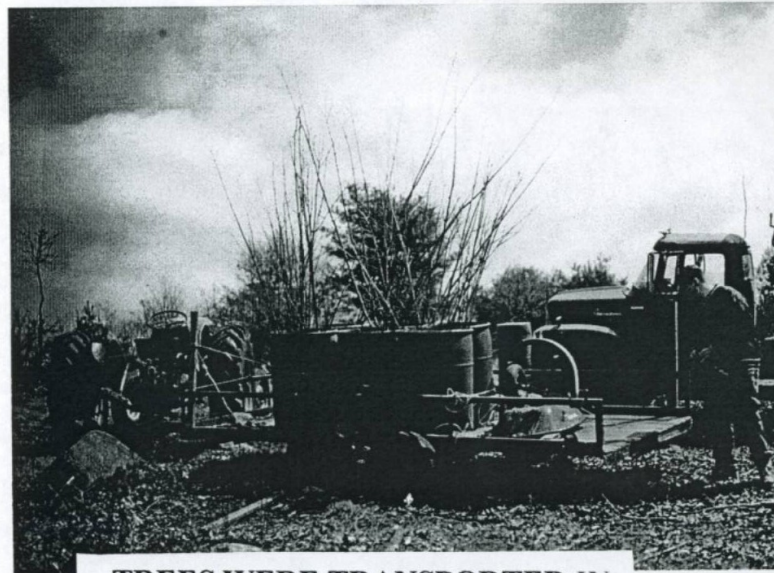
**LAND CLEARED FOR FIREWOOD  
HAD GROWN BACK TO BRUSH  
HAD TO BE CUT AND MOWED AGAIN**



**ROWS WERE LAID OUT 8'X8'  
APPROXIMATELY 700 TREES / ACRE**

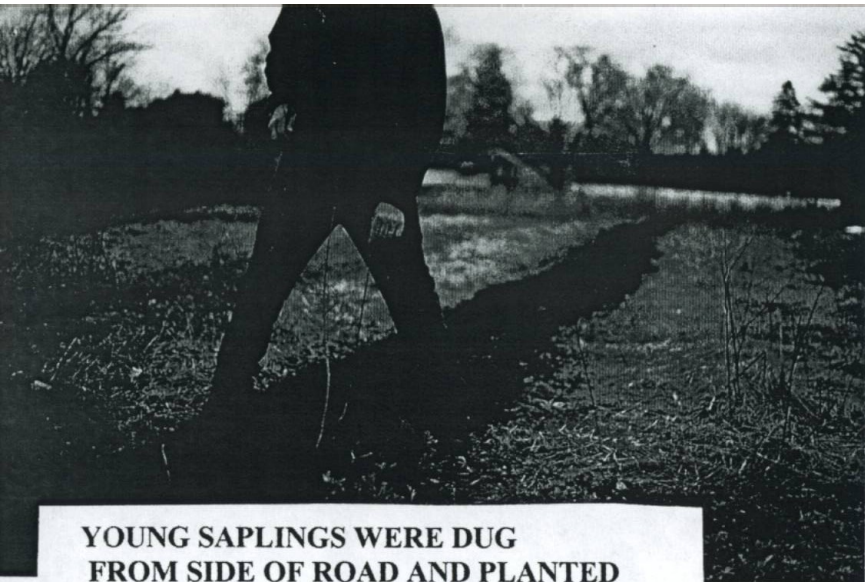


**LAND WAS SO ROCKY, I HAD TO USE MY  
BACKHOE TO DIG HOLES**

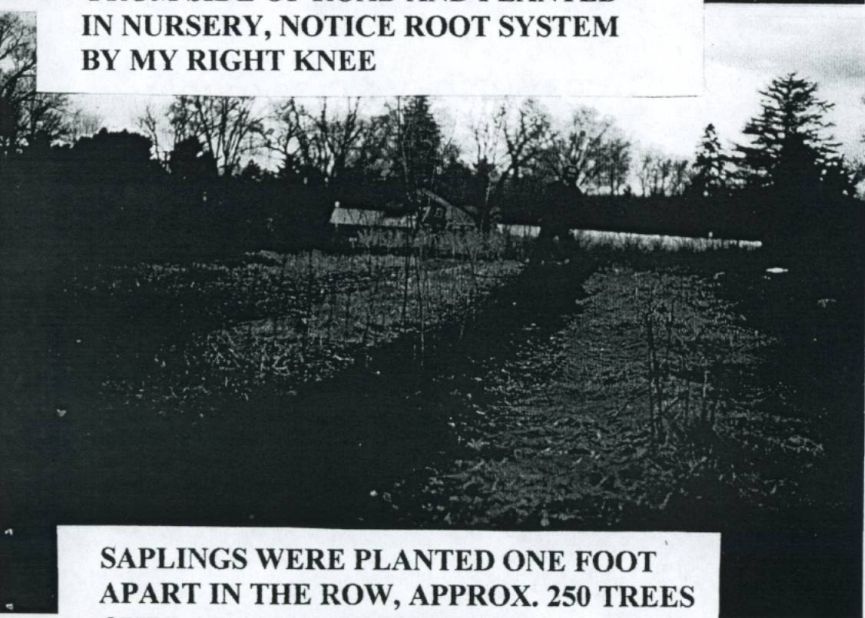


**TREES WERE TRANSPORTED IN  
BARRELS OF WATER**



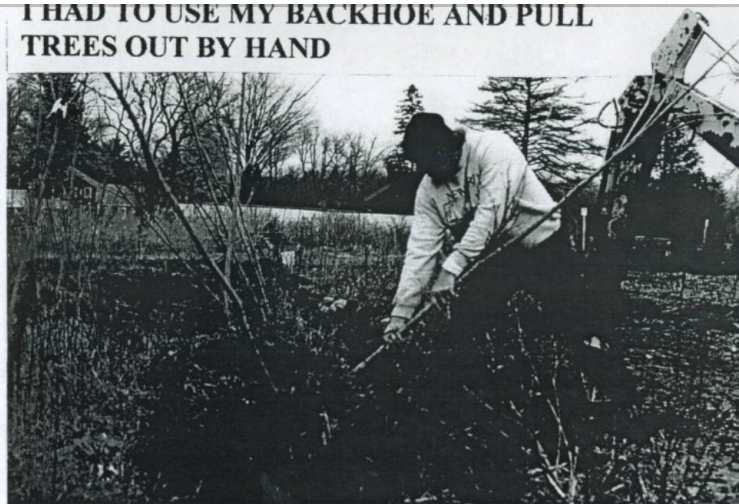


**YOUNG SAPLINGS WERE DUG FROM SIDE OF ROAD AND PLANTED IN NURSERY, NOTICE ROOT SYSTEM BY MY RIGHT KNEE**



**SAPLINGS WERE PLANTED ONE FOOT APART IN THE ROW, APPROX. 250 TREES OVER 90% SURVIVED SO FAR**

**I HAD TO USE MY BACKHOE AND PULL TREES OUT BY HAND**



**AFTER ONLY ONE YEAR IN NURSERY LARGE FIBROUS ROOTS HAD DEVELOPED**