

Silvopasture in the Northeast: FNE03-484

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Goals: This project has been an attempt to maximize the productivity and profitability of grazing land through silvopasture. Pasture is in short supply in many parts of the northeast, resulting in the need for expensive supplementary feed costs. In addition, grain and fuel prices are currently extremely high; the more use a farmer can make from his/her land, the greater chance that that farmer will stay in business. Turning wooded areas into a productive pasture while developing tree crops helps make a small farm such as ours more sustainable economically and environmentally.

This project involves clearing and thinning portions of the forested land on our farm and developing it into silvopasture. The land designated for this project is grazing area for cattle and poultry. Valuable existing trees have been left while less valuable trees have been culled for lumber and firewood. Valuable small trees from other areas on our farm have been transplanted to the silvopasture area and seedlings have been purchased with an eye for the long term timber market.

Ultimately, the goal of this project has been to develop tree crops and grazing land together in one location on our farm to make our farm more successful.

We started this project at our current farm in 2004. The project was completed in the fall of 2007.

Our Farm: This project was begun on our small farm in Phillipston, Massachusetts. In July of 2004, we moved our farming operation to New Sweden, Maine. Our current farm comprises fifty-seven acres, approximately twenty of which are open or semi-open fields. The remaining thirty-seven acres are in woods.

Because of differences in climate and soil, the trees species at our current location are quite different than on our farm in Massachusetts. Whereas red maple, white pine, and red oak dominated the woods on our other farm, white spruce, fir, tamarack, poplar, and white cedar are the most common trees on our new farm. We also have some sugar maple, yellow birch, and white birch here in New Sweden. Overall, the woods here are more diverse.

One result of our move to Maine was the selling of our small flock of sheep. (They were sold or butchered in the spring of 2005) Although they worked well in our rotational grazing schemes, we needed to focus more on our continually growing herd of cattle. Before we eliminated the sheep flock, we used them to graze down some of the brush that had grown up in some area of the silvopasture area. Although our current farm had not been grazed or cropped for the past twenty years, most of the fields had been mowed every year. A right of way granted to the local power company had not been mowed and some corners of fields had not. The sheep served a useful purpose in grazing plant species that cows usually do not consume. In fact, it is still possible to see where the sheep grazed three years ago; in areas where the sheep grazed, there are fewer brushy weeds and more timothy and clover.

Currently, our flock of rare Pilgrim Geese is expanding; we now have eighteen breeders—three ganders and fifteen geese. The geese graze in areas where it is not practical to put cows. They also follow the cows, consuming some of the grass near cow patties which the cows would not eat. They spread their own manure, graze better than other poultry, and defend themselves well against predators. We plan on grazing them through parts of the land used for agroforestry in future years.

We currently have eighteen head of cattle, including young stock. We are training a young team of Dexter oxen and have seven cows and heifers bred for 2007. We have been selling dairy products from our farm. We continue to sell honey, eggs, poultry, and livestock. We were accepted into the state of Maine's Farms for the Future Program in 2006. We are working on a marketing and operational plan that will help us bring one of our main products—cheese—to a larger consumer group.

One essential addition to our operation was the purchase of a small band sawmill in 2004. The sawmill allows us to build barns economically and to add value to the cull wood produced in the process of developing silvopasture.

The Project: Because of our move, we started the agroforestry project over. After settling in, we got a good look at the land on our new farm. Like the land at our old farm, the wooded areas had been logged in the recent past—now about eight years ago. Luckily, they were not logged too heavily.

First, we identified the areas on the farm that would be used for the agroforestry project. Fortunately, this farm is comprised of a patchwork of fields and woods, which lends itself to silvopasture. There is a twelve to fifteen acre field near the house. To the north of the field, woods intersperse with one field of approximately four acres and one field of approximately two acres.

Also, power lines run diagonally across the farm, from the southeast to the northwest. We have a no spray contract with the power company which states that we will maintain the growth on their right of way. They will not spray herbicides. We graze the power lines within our rotational/intensive grazing management plan and dig up valuable seedlings from the right of way for planting on other parts of the farm, including the area designated for silvopasture.

The silvopasture area includes edges of fields and wooded areas between fields roughly stretching from the southeast corner of our property towards the northwest. A strip of land to the north of our largest field is also included. The total silvopasture area is approximately ten acres, though the fields also have trees in some areas and if included in the tally would mean that the

total acreage in silvopasture would be about fifteen acres. **(Please see attached sketch).**

In 2004, once we had the area outlined, we hauled the wood that was on the ground in the silvopasture area, leftover from the previous logging operation. We used our team of oxen for this part of the project. This wood was mostly poplar and white cedar. The poplar was sold as firewood and used as firewood for our farm. The cedar was used as fenceposts and turned into lumber for beehives and barns. Blowdowns continue in the silvopasture area.

We identified the more valuable species in the silvopasture area and on the farm in general. Within the silvopasture area, the more valuable wood (in the near future) is the spruce and fir. Most of these trees are fairly young and have been left, except along the edges of the fields, where they have been thinned to expand the fields, which have grown smaller though years of relative disuse. All of the white and yellow birch and tamarack in the silvopasture area has also been left alone, except for obviously damaged trees.

One advantage of birch within the silvopasture project is that the cows rarely if ever eat the bark of birch trees. They will damage poplar bark, possibly killing small trees and will damage the lower branches of conifers from scratching. In general, our plan has involved grazing the silvopasture area only during the summer, when grass is abundant, thereby limiting the tendency of cows to damage trees.

In the spring of 2005, we planted approximately twenty sugar maple and twenty black walnut within the silvopasture area. These purchased seedlings were planted on the edges of fields and woods, in areas that will allow the least amount of cattle traffic while the trees are small. Approximately fifty percent of these trees have survived as of November of 2007.

In the spring of 2006 we planted fifty more black walnut seedlings in the silvopasture area. Although we had planned to use butternut for this planting, seedlings were unavailable. Fifty white oak seedlings were also planted within the silvopasture area. These trees, though slower growing than butternut or black walnut, also are extremely valuable as lumber and will add value to the farm in the long run. Planted oak trees do thrive on our street, though they do not seem to be common in the wild ecosystems here. We have also recently located a few indigenous oak trees within the silvopasture area, which will be protected from the cows.

Tamarack and spruce seedlings from the power company's right of way were also planted in the silvopasture area in 2007. Tamarack grows very quickly and is valuable as lumber, since it is both rot resistant and durable. In fact, tamarack seems to fit quite well into our overall silvopasture plan, since the cows do not bother it, even when it is left unprotected in the pasture. Tamarack seems to flourish in our climate.

(Please see attached sketch)

Within the entire silvopasture area, an average of approximately 75% of sunlight was blocked by the forest canopy when we arrived at this farm in 2004. Some spots were quite open, while others were still nearly completely forested. Our goal is to maintain 50% of the silvopasture area as forested and 50% as grass-producing. Overall, sunlight in the silvopasture area is blocked approximately 50% as of November, 2007.

Results:

Feed Value of silvopasture area:

During the 2004 grazing period, the silvopasture area provided 100% of the feed requirements for eight small to medium sized cattle (six dexters and two ayrshires) and six Jacob sheep for twelve days.

During the 2005 grazing period, the silvopasture area provided 100% of the feed requirements of twelve small to medium sized cattle (six dexters and six dairy crosses) for twenty two days.

During the 2006 grazing period, the silvopasture area provided 100% of the feed requirements of fifteen small to medium sized dairy cattle (seven dexters and eight dairy cows or dairy crosses) for thirty days.

During the 2007 grazing period, the silvopasture area provided 100% of the feed requirements of thirteen small to medium sized cattle (eight Dexters and five dairy crosses) for thirty-three days.

Year	2004	2005	2006	2007
Approximate bales of hay replaced by silvopasture	84	176	300	297

The cows continue to make good use of the silvopasture area, often using the area as shelter for hot or otherwise inclement weather. They continue to browse brush in the area. They have not damaged many of the trees in the area, largely because of the rotational grazing strategy employed on our farm.

The productivity of the silvopasture area as grazing land roughly doubled between 2004 and 2005 and again between 2005 and 2006. Much of this improvement resulted from having animals on the land grazing and from spreading approximately three tons of manure per acre annually.

Productivity also increased because the amount of sunlight increased by approximately 25%. Undesired species of trees, particularly Balm of Gilead, along with damaged individual trees of various species, were removed over the course of the four years. The cows removed some of the brush while grazing.

Roational grazing is key to the success of a silvopasture project such as the one conducted on O'Meara Family Farm. Our farm contains six paddock which comprise from two to five acres of land. The cows are currently grazed on a roatational plan where each paddock is grazed for five to seven days, depending on the condition of the forage and the weather. Because the cows are not on any particular paddock for extended periods of time and not in the silvopasture area in the winter, they are often not destructive to trees. Although they have damaged the lower branches

of some older spruce trees and have chewed the bark of young poplar trees, they have not damaged many of the trees of value in the silvopasture area. Without rotational grazing, silvopasture would not succeed on this farm.

In addition to the increase in grazing productivity, this project benefited the cows and the farm in several other ways.

Wood:	Year			
Cords firewood harvested from silvopasture area	2004	2005	2006	2007
	2	5	8	5
Board feet harvested from silvopasture area	2004	2005	2006	2007
	1000	1500	2000	1000

At current prices, the total value of the firewood harvested from the silvopasture area would be approximately \$3000

At current prices, the total value of the wood used for dimensional lumber harvested from the silvopasture area would be roughly \$2800

Similar or larger amounts of firewood could easily be harvested from the silvopasture in future years without impacting the longterm goals of harvesting quality sawlogs in future decades. Blowdowns and weed trees will be the target for firewood harvest.

In general, this agroforestry project has convinced us that silvopasture should be an important part of our farm. Several wood products, including lumber and firewood, offer real potential for profit. With relatively little financial risk involved in normal development of a silvopasture, it seems that our farm should continue to devote our time to agroforestry. We produce and train teams of oxen with little or no capital investment— we harvest wood in winter, when other farm obligations are minimal.

This project has taught us that tamarack works particularly well in a silvopasture setting, especially in a northern climate. A fast-growing, extremely hardy tree adaptable to a wide variety of soils, tamarack produces durable and rot-resistant wood, which fetches a premium at local sawmills in our region. The cows bother it less than other species and it produces a crop quickly. We would recommend it to other farmers considering a silvopasture project.

Black walnut also works particularly well in a silvopasture setting. Because of its value, it adds to the long-term viability of any project like the one conducted at O’Meara Family Farm. Its slower growth makes it a fit companion to tamarack or other species in silvopasture.

Another key advantage to silvopasture on our farm has been its function as shelter for our animals. Because of the rotational grazing scheme in place on our farm, the cows have access to

a section of silvopasture most of the grazing season. This has been an invaluable asset during not infrequent inclement weather. The cows take shelter when they need it in the silvopasture areas.

Overall, the silvopasture project meshes well with our long-term goal of continuing to build up our small dairy herd. It is a project that would function well on any livestock farm, but fits particularly well with a low-input dairy farm such as ours. Whereas many woodlots in our neighborhood are over harvested, we feel that ours is improving in value while providing feed for cattle. We see the use of silvopasture as a management tool to increase the value and profitability of our diverse farm.

We will also continue to harvest sawlogs from the silvopasture area. We will be able to do this without impacting the longterm goals of growing quality sawlogs largely because we have a small bandsaw sawmill that is able to make use of small logs that would hold little value at larger commercial sawmills. In addition, we are able to harvest these smaller, often damaged or blown down logs with our oxen, thereby not damaging the woods as would a skidder or other large logging equipment. Trained teams of oxen are also a product our farm sells. The success of this silvopasture project hinged to a large extent on having the oxen and the sawmill here on the farm. If we had hired a contractor to harvest the logs or saw the logs, the project would have been less advantageous to the farm as a whole.

The land devoted to silvopasture for this project will remain silvopasture. We will continue to graze the silvopasture and harvest firewood and sawlogs. A larger harvest of higher quality sawlogs is tentatively planned for in approximately fifteen years.