Planning a productive acre

The idea for "Planning a Productive Acre" comes from seeing many older island farm homes tucked into a grove of mixed woods. Think of all the benefits that good site planning provides - an attractive, comfortable setting; a close source of fuelwood and lumber; shelter from the prevailing winds; lots of nearby wildlife to appreciate. But what if your house is stuck in a field, like so many are today? What options do you have? Fortunately, you have choices available.

An overall look at the Productive Acre would show the northernmost row to have a lot of white spruce and other hardy trees and shrubs to help protect the rest of the forest. Other rows would contain a mixture of trees and shrubs. The rows would alternate between having a lot of trees for fuelwood and having more trees for lumber.

The Productive Acre is based on several different planting systems. "Coppicing with Standards" is a system that has been used for centuries to grow a variety of products on the same acreage. "Coppicing" refers to the repeated cutting of trees from the same root stock. Clumps of red maple that occur in Island forests usually result from a previous cutting. New sprouts from the stumps grow very fast as they have the extensive root system of the old tree to draw from. "Standards" are the trees in the acre specifically grown for either softwood or hardwood lumber.

We have taken this system several steps forward and included shrubs for a variety of reasons:
* to add nutrients and organic matter to depleted soils
* to attract wildlife
* to provide shade, moisture conservation and protection for other less hardy plants
* to provide the diversity that will help confuse insect predators that may get out of control in a monoculture
* the roots of shrubs and other brushy (early successional) species can help break up compacted soil layers

The following plan is meant to be used as a guide for designing large plantings around your home. The plan is for 1/4 acre (.1 ha) and these blocks can be stacked side by side or one over the other. Plantings can wind up being long rectangles, squares, curved or L-shaped. The site and the owner's needs will dictate the best shape.

Many of the recommended species are easy to transplant or grow from seeds or cuttings and nurseries are slowly starting to grow a variety of native plants. Feel free to substitute appropriate species.

The Productive Acre will provide a wide variety of resources and accomplish several different goals.
1. As a windbreak: you are creating a small forest that will break the wind and create a more comfortable setting for your home. It can also save money by helping to reduce heating and snow removal costs.
2. To attract wildlife: even small plantings can really change the dynamics for wildlife around homes. The food production, the nesting sites, the protection offered by a variety of trees and shrubs all serve to make the area more attractive to many species of birds, amphibians, insects and small mammals. It will obviously be a while before you get dead trees large enough to provide cavities for barred owls, but black-capped chickadees, robins and many other birds will come fairly quickly once the trees are established.

3. As a source of fuelwood: hauling wood from the back forty can be a problem, even if you do have a tractor. Many of the species that can be planted, such as red oak, red maple and white ash, make excellent firewood and can be repeatedly cut by the "coppice" method. As well, you get fuelwood that is close to your home, easy to handle and a good size for most stoves.
4. As a source of lumber: both softwood and hardwood lumber can be produced under this system. The conifers (except for the white spruce grown on the north side of the planting) are for lumber production. White pine, balsam fir and larch should all make good growth on most...
sites. As well, white birch, white ash and red oak can be grown for hardwood lumber. Since they are growing in full sun at first, which produces heavier branches on the trees, it is advisable to go through and properly prune the young lumber trees every two years.

5. As a source of other products: whether you want to harvest fenceposts, fruits and nuts, mushrooms, medicinal herbs, or basketmaking material, these plantings (like most healthy, mixed forests) will provide a multitude of products that can be used around the home.

6. To build soil: the importance of good soil health is often underestimated in forest plantings. Especially since many fields are lacking in both organic matter and nutrients, the role of shrubs is very important. The litter of dead leaves and branches provides important soil nutrients. For example, alder leaves are rich in nitrogen and dogwood litter is high in calcium. As well, alders fix nitrogen in their roots and are one of our most important soil builders.

7. As a landscape planting: many of the native plants that are suitable for this type of planting are also very attractive. Instead of bare fields and drifting snow, imagine a mixed forest full of interesting trees and shrubs. Red maple and staghorn sumac give a colourful show in the fall, and many of the trees and shrubs have attractive flowers in late spring. As the forest develops, it will become even more of an asset to your property, though it will be your children who will really benefit from the work that you do.

8. Pesticide reduction: if you are planting a manicured lawn or cropped field, your pesticide usage will drop to zero. The diversity and focus on soil health will help avoid serious insect and disease infestations in these plantings. If necessary, hand pick problem insects off the young seedlings. Fertilizer requirements will be minimal, although it may be worthwhile to put some compost or well-rotted manure in with the “standards”, especially if organic matter is low.

**Preparations for planting**

Plan your plantings well in advance. Know what species you wish to plant and what pattern they will grow in. Mark out rows but remember that they do not have to be straight. Some can be closer together or farther apart and rows can curve and sway, making a more pleasing planting. In Fall, or before the planting day in Spring, remove several feet of sod from each planting area by shovel. Site preparation can also be done in narrow planting strips using a tractor with a plow, discs and harrows; a tractor-mounted tiller; a sod stripper; or large home tiller. Have water and wood chips or other mulch on site.

**Planting the productive acre**

Please read pages 21 and 22 before undertaking any planting. Plantings should be done in the late spring before the trees and shrubs have leafed out or flushed with new growth. All seedlings in a block can be planted at once, or they can be planted over several years. You may want to plant one block each year for a few years. The key is to be flexible. If you have trees or shrubs already growing up in the place you want to plant, either work the seedlings into your plan or transplant them to another area. Remember that you will be planting approximately 400 trees and shrubs per acre (1000 per ha) at 10'x10' (3mx3m) spacing. If there is much regeneration on the site already, you may reduce this figure by hundreds of plants. Have some friends or family along to help dig the holes and plant and mulch the seedlings.

**Maintenance and additional planting**

A cornerstone of the Productive Acre system is that you will never clearcut the area and have to replant. You will get a variety of high-quality products and the trees and shrubs will do a more than adequate job of reseeding themselves. In fact, you should be able to collect seed and carefully transplant young seedlings from the site for other forest restoration projects. Yet since the planting originally takes place in a field with little or no shade, there are certain species (such as hemlock and sugar maple) that cannot be planted at the start. These can be added later, when some of the plants are providing shade and protecting the site from drying out. Maintain a heavy mulch or mow between the rows for the first few years to reduce competition. The only other maintenance will be proper pruning of crop trees. The Macphail Woods Ecological Forestry Project offers annual pruning workshops and there are several excellent publications available on the subject.
The Plan: The windbreak row at the north (top) of this planting is critical in providing protection for interior trees and shrubs and the home itself. It is only necessary at the northern border of the planting, although it will not cause problems if you have this row scattered throughout a larger planting. There are many other plants that you can choose to replace those in this plan, especially shrubs that like to grow in full sun. Willow, wild raisin, staghorn sumac, highbush cranberry and wild rose will do especially well in this type of planting, so feel free to substitute. If you want to simplify the planting, you can eliminate some of the species of shrubs, as well as trees such as butternut and balsam fir. In this map, solid circles represent coniferous and deciduous trees, while the double-wall circles indicate shrubs.

The Harvest: Crop trees for lumber are spaced throughout the planting. In the second from the top row the white pine, red oak and larch will be left to grow older and pruned if necessary. In the third row only the butternut will be targeted for lumber, while the white ash, red maple and red oak will be coppiced for fuelwood. In the fourth row the red oak, balsam fir and white ash will be left. Timing of harvest depends on your needs. You can harvest fuelwood in 12-15 years while the white pine can grow for hundreds of years. A few trees in each block should be left to grow old and fall down, providing habitat and nutrients for centuries.

Key to species and numbers:
A - Apple 4
AL - Alder 6
B - Butternut 4
BF - Balsam fir 4
CE - Common elder 4
D - Red-osier dogwood 10
H - Hawthorn 6
L - Larch 6
MA - Mountain ash 6
RE - Red-berried elder 6
RM - Red maple 10
RO - Red oak 14
SB - Serviceberry 8
WA - White ash 12
WB - White birch 6
WP - White pine 8
WS - White spruce 11