

Agroforestry Resources for the San Juan Islands

By Daniel Tucker

What is Agroforestry?

Agroforestry is a suite of practices that integrate trees and tree crops with other agricultural crops and/or livestock, in a system that delivers multiple yields over the span of years or decades. There is a great deal of overlap between agroforestry and permaculture practices, as well as what is now called ‘regenerative agriculture’. Agroforestry is not new- people on every continent have managed trees as elements of a productive landscape for millennia, using fire, grazing, pruning and transplanting.

Agroforestry is most commonly practiced in tropical regions today, where greater solar radiation means there are more possibilities for growing crops in the shade of trees, and where marginalized farmers have had more incentives to innovate than in affluent countries which subsidize crop production. However, agroforestry is now gaining ground in temperate regions as its potential benefits become more widely known. Incorporating more trees into our agricultural landscapes can increase yields, make farms more diverse and resilient, support ecosystems and wildlife, and mitigate climate change by sequestering more carbon in trunks and roots. Some of the most common patterns used in agroforestry are:

- **Forest Gardens**

Forest gardens are multilayered, carefully managed polycultures combining fruit and nut trees, shrubs, vines, groundcovers, and perennial vegetables. In cool temperate climates, tree spacing must be wide enough to allow sufficient sunlight to reach the understory, thus the analogy of ‘savannah gardens’ might be more appropriate (cite). They are often managed as home gardens where frequent attention can be given to harvesting the large diversity of crops over much of the year.

- **Treelines and Intercropping**

Trees and/or shrubs planted closely in lines, with lanes of arable land or pasture in between. Spacing is variable depending on species used, climate, soils, and mechanization, but a common lane width in climates similar to ours is 60’ to 90’. The lanes must be wide enough that there is not excessive shading of crops or forages from the trees, but narrow enough to reap the benefits of wind protection and beneficial insect habitat. The trees may be selected for fruit, nuts, timber, ruminant fodder, or purely biomass production, but generally speaking one aspect of production must be given priority, while the others are secondary. For example, walnut trees allowed to grow optimally for nut production will produce poor timber, and vice versa. Trees that can be pruned, pollarded, or coppiced will present less threat of shading the intercrop. However, in some cases the intercrop is simply used as a short-term yield until the tree crops or timber reach maturity: the lanes are allowed to grow more and more narrow over time. Variations of this staggered cropping method have been practiced for centuries in Europe, one example being perry pears planted at 40’ spacing in wheat fields, the wheat being replaced by silvopasture once the trees mature (cite)

- **Windbreaks and Shelterbelts**

Compared to treelines, windbreaks and shelterbelts are typically planted at the edges of fields or at wider intervals in large open landscapes. They can also be wider, as a staggered planting is more effective at reducing wind speed and also provides more cover for wildlife and beneficial insects. Multiple layers of trees and shrubs with a complementary variety of heights can be used to maximize the sheltering effect. Strong winds can have severely adverse effects on crop growth and also any insects pollinating the crop. The trees and shrubs can also provide a significant resource for pollinators, as well as fruits, nuts, timber, fodder, firewood, and other products.

- **Silvopasture**

Silvopasture can follow a number of planting patterns, including that of treelines, but perhaps the most common arrangement is grazing ruminants under regularly spaced stands of timber trees. Given that the trees are either adequately protected or large enough that the animals will not damage them, both timber and livestock can benefit from weed control and fertilization on the one hand, and shade, shelter, and diverse forage on the other. Management intensive grazing methods are essential to keep the animals moving and keep the soil in good condition; animals allowed to stay too long in one place can cause soil compaction and irreparable damage even to mature trees.

- **Tree fodder or Tree hay**

Sometimes combined with silvopasture, tree fodders are foliage of trees fed to livestock, either fresh, dried and stored like hay, or fermented like silage. Tree hay has an ancient history in Europe and the Middle East, and likely other regions as well. Choice of tree species and livestock is crucial, as well as timing the harvest so that trees are not overtaxed. Harvest of tree hay is often combined with harvesting wood for lumber and firewood, and certain tree species can be coppiced or pollarded at regular intervals over a lifespan of centuries. Indeed, some of the oldest trees in the UK are pollard oaks and chestnuts that would have long since been toppled in storms had they not been pollards. These ancient pollard trunks often grow hollow and provide important habitat for rare flora and fauna.

A Little Island History

The landscapes of the San Juan Islands were managed by Salish peoples for a very long time prior to the arrival of Europeans. Some areas were periodically burned to promote a savannah of grasses, edible bulbs, and Garry oak (*Quercus garryana*). This oak savannah is still an important template for agroforestry in our region. Fruiting woody plants like Pacific crabapple (*Malus fusca*) and salal (*Gaultheria shallon*) were also important food sources in terrestrial ecosystems. The abundant fish, shellfish, marine mammals, and migratory waterfowl of the region were a large part of Salish diets, and it is important to recognize that the oak savannah and other terrestrial ecosystems did not supply all or even the majority of the nutritional needs of Salish peoples living here in the past.

White settlers undertook a variety of agricultural projects on the San Juan Islands, beginning with free range grazing of cattle, sheep, pigs, goats and horses, and growing annual grains and vegetables. Apple, pear, and plum orchards later became an important part of the local economy, before irrigation projects in Eastern Washington and changes in regional transport networks rendered island orchards less profitable. Dairy and poultry operations were also active in the islands during the peak of agricultural activity in the early twentieth century. Beginning around the Second World War, the total acreage in farming began to decrease along with the number of farms. In the 1970's the number of farms began to increase, while the total acreage has stayed flat at around 20,000 acres. Tourism and custom home construction have replaced agriculture and fishing as economic mainstays, but interest in farming is strong, attested by the growing number of small farms and homesteads. There is a growing sense among the public that farming is not purely an economic pursuit but one with environmental and social ramifications that can effect positive change in the world. Carbon sequestration is a vital concern, and indeed there are ways that agroforestry can help our food production systems put away more carbon.

Why pursue agroforestry here? Why make long term investments in trees and complex systems when annual agriculture and livestock alone can yield in the short term? First, let us consider our soils and climate.

Climate

The climate is generally mild and temperate, having a strong maritime influence and a sub-mediterranean rainfall pattern, with a period of summer drought typically including July and August, but sometimes extending from May to September. Climate studies by University of Washington researchers indicate that we will probably see both a slight increase in rainfall and an increase in the severity of summer drought over the coming century, with rain falling in more intense, concentrated events in fall, winter and spring, and summers having higher temperatures and longer intervals between rains. Winter temperatures will also become gradually warmer, and by 2040 we will probably move from USDA Hardiness Zone 8 to Zone 9. On the brittleness scale defined by Allen Savory and colleagues, we fall most of the way towards the non-brittle end of the scale, meaning that undisturbed land will tend to become forest over a period of years. However, on very dry soils this process may be very slow.

Soils

We live on a collection of rocky peaks jutting from an inland sea, a landscape that was largely scraped bare by glaciers less than 20,000 years ago. The soils of the San Juan Islands are generally marginal for agriculture and also highly variable, making accurate assessment of soil types crucial to growing anything successfully. A distance of 100 feet may span wetland, seasonally waterlogged clay, moderately drained loam, well-drained gravelly loam over bedrock, and exposed rock outcrop. Planting a tree 20 feet one way or another along this gradient can make the difference between the tree thriving or dying. Apart from a few small areas, level ground and deep soil with good drainage are uncommon. (Good drainage can be defined as soil that passes a percolation test: a bucket of water poured into a 2' deep hole will drain completely within 24 hours)

Rock outcrops abound, rising unto hills and mountains skirted with sandy, gravelly loams- well drained but shallow and low in organic matter (especially once forest cover has been removed). Gentle slopes and valleys below approximately 400' in elevation are largely characterized by glaciomarine clay, a heavy blueish-gray subsoil that often becomes waterlogged in winter and brick-hard when it dries out in summer. These areas were at or below sea level at the end of the most recent ice age, and received large amounts of fine sediment from the melting glaciers. In certain areas there are larger deposits of mixed glacial sediment including layers of sand, gravel, silt and clay. These areas are generally better drained and more productive than areas of pure clay, but are limited in extent.

These conditions make conventional practices such as tillage and the use of large machinery more difficult and in some places impossible. Annual crops have only one growing season to establish a root system, while drought tolerant species of tree like the native Garry oak can spend decades or centuries sending roots into every available crevice of bedrock to find water and nutrients. Perennial crops like trees and shrubs are better suited to most of this landscape, as well as perennial and self-seeding forage crops like grasses and clover.

Species

The species listed below are among the most common native and naturalized woody plants on San Juan Island. Not only are they potentially useful in our agroforestry systems, their presence and health condition hold a great deal of information about the site. The plant life growing in any particular spot will reflect the qualities of the soil.

- **Douglas fir, *Pseudotsuga menziesii***

The undisputed arboreal ruler of the islands, this is by far our most common tree species. A pioneer species that easily colonizes disturbed soils, it can also be quite long-lived and attain great size. Douglas fir is one of the primary threats to our remaining areas of Garry oak habitat, because in the absence of fire the firs are able to rapidly outgrow and overshadow the oaks, as well as competing for soil moisture. Douglas fir tolerates most soil conditions here, from very shallow soil around outcrops of bedrock, to slowly draining clay. Its health tends to decline with poor drainage, and individuals growing in wet clay soil may die if drainage is further obstructed by roads or other earthworks. The density and regularity of the crown are good clues to health: trees in poor soil will become prematurely spindly and ragged, those in better conditions will have dense foliage and more symmetrical branching. The older the tree, the thicker the bark will be, even when the trunk is growing very slowly.

Given how prolific it is here, we would all do well to become thoroughly acquainted with the uses of Douglas fir. Straight young trees provide useful poles that can be moved by one person. While the wood is well known as lumber and firewood, the foliage can also provide a dietary supplement for goats and sheep. In winter they will even strip the bark from branches and small trunks less than 6" in diameter. If heaped on the ground for a year or more, the branches will shed their needles, which can then be shaken off to leave a pile of fine mulch- perfect for blueberries or general purpose bedding and composting. The thick bark of old trees burns even hotter than the wood, and the sap is traditionally used as glue and a medicinal salve.

A pole-mounted pruning saw is an excellent tool for harvesting the lower branches, while also letting more light into the understory. In general, up to a third of the living crown may be removed without seriously affecting the tree's health. The island abounds with dense, second-growth stands dating to the mid-20th century decline in farm activity, and many of these present opportunities for pruning and thinning.

- **Red alder, *Alnus rubra***

This is perhaps our second most common tree. A pioneer of disturbed soils, like Douglas fir, the alder rejoices in wet and even swampy places, and has a low tolerance for drought. Alders grow very rapidly in youth but usually decline and die after 60 or 70 years. This rapid growth is due in part to their symbiotic relationship with a soil bacterium in the genus *Frankia*, which pulls nitrogen from the atmosphere and makes this essential nutrient available to the alder in exchange for carbohydrates. Dig up the the roots of an alder and you will see the warty nodes where these bacteria live inside the roots. Alders then fertilize the soil around them via their leaf litter and rotting wood. There is usually rich soil under beneath a mature stand of alders. Where healthy alders grow close by healthy madronas, which will not tolerate waterlogging, you can be sure the soil is both well watered and well-drained. Where small young alders are dying, the soil is generally too dry for them in summer. Where large alders are dying, it is usually just the end of their short lifespan.

The wood of alder makes fragrant firewood and is a traditional choice for smoking salmon, although it gives off less heat than many other woods. Green alder wood is excellent for carving spoons and other kitchenwares, and the seasoned lumber has been used on a larger scale for furniture and cabinetry. It is structurally weak and rots quickly, but these properties also make it a valuable contributor to soil organic matter. This process can be accelerated with a wood chipper, but the logs will decompose just fine on their own. Oyster mushrooms can be grown on freshly cut alder logs. The leaves can be fed to sheep and goats as a supplementary fodder. While young alders respond to pollarding and pruning with vigorous regrowth, older trees don't tolerate more than the removal of a few lower branches, and usually do not resprout if cut to the ground.

- **Upland Willows, *Salix hookeriana* and *S. scouleriana***

The two species of upland willow native to the San Juans are very common and yet often overlooked trees. Small to medium sized rounded trees, often with multiple sprawling trunks, they inhabit a range of soils from rock outcrops to wetland edges. Though individual trunks are short lived, if the base of the tree receives ample sunlight it will continue to grow new trunks and form a small grove or thicket in time.

The leaves of both species are a good fodder for sheep and goats, particularly in late summer and early fall when they seem to become more palatable. Like most willows, they respond well to coppicing or pollarding provided ample sunlight and protection of the new shoots from deer or livestock. The wood of both is quite serviceable for carving and as firewood, although that of Scouler willow seems to be slightly more dense. Both species are easily propagated from cuttings, up to the size of a fencepost, and this makes them very useful for agroforestry systems. Many willow

species can be used to make living fences and suspect that our native willows would serve this purpose as well.

- **Pacific crabapple, *Malus fusca*, and Domestic apple, *Malus domestica***

The Pacific crab is, like the upland willows, a very common and commonly overlooked species. It grows in most habitats and soils on the islands, from very wet clay to dry rocky loam, and from forest understory to open fields. Its small, tart fruits have been a traditionally important food source for many native peoples of the Northwest, and the trees were cultivated for this purpose. These tart fruits may be preserved by simply submerging them in clean water in a shady outdoor location, such as a covered 5-gallon bucket. The wood is very dense and useful for mallets and other tools. *Malus fusca* is also graft compatible with domestic apple, providing a full size or standard rootstock that is more tolerant of waterlogged soil than any other apple rootstock. Wild trees with sufficient sunlight can be successfully top worked with domestic apple scionwood. The leaves also provide excellent fodder for sheep and goats.

- **Oceanspray, *Holodiscus discolor***

This tough shrub is very common in open and forested areas where drainage is good and soils become dry in summer. Although commonly seen as a weed due to its scruffy appearance and potentially allergenic pollen, it is a useful plant in many ways. The wood is extremely dense, probably the hardest of any of our native trees and shrubs, and also quite strong. The larger stems are excellent for tool handles, and although one or two radial cracks often appear along the stem after seasoning it remains at least as strong as hickory or ash. Smaller stems and forks are useful for stakes, tree props, dowels, coat hooks, door handles, wooden spoons, any place a small, tough piece of wood is needed. Although not rot-resistant in an outdoor setting, it can be oiled or varnished once dry. The plant coppices well given sufficient sunlight, and its dense growth could have potential use for hedging to contain livestock and shelter crops. The leaves are moderately palatable to sheep and goats, although one farmer reports that her horses relish it.

- **English hawthorn, *Crataegus monogyna***

A very spiny shrub to a small tree, the English or common hawthorn is a Eurasian species that is supremely adapted to the grazing and mowing pressures of agricultural environments. Like the native crabapple, it tolerates a wide range of conditions, from sun to shade and dry rocky soil to wet clay. Being spread by perching birds, it proliferates in abandoned or lightly managed farmland, and so has become very common here. Although seen by many as a terrible weed, it has many uses as well. In the UK it is the main species used for stock-proof hedging, something that could be done here although we should give some of our native species a chance to fill that role as well. The wood is very dense and makes excellent firewood, being the traditional choice for fring bread ovens. The regrowth of straight stems a few years after coppicing provides good material for tool handles and small poles. A sharp billhook and thick gloves such as welding gloves make managing hawthorn a less daunting task. It is graft compatible with all other hawthorn species (some of which have desirable fruit) as well as with medlar (*Mespilus*

germanica) and to a lesser extent domestic pear. An extract of the leaves is a common herbal treatment for heart conditions. The fruits as well as the young leaves were historically eaten in Europe in times of food scarcity.

- **Wild cherry or Mazzard, *Prunus avium***

A slender, small to medium-sized tree, the wild offspring of domestic pie cherries and a common rootstock for both fruiting and flowering cherry varieties. The mazzard requires a well drained soil but otherwise tolerates a broad range of conditions. The leaves may contain some cyanide precursors common to the genus *Prunus*, and this probably gives it some level of defense against deer browse. Goats and sheep feeding on small amounts of the fresh leaves showed no ill effects, but caution is advised. The wood is a lustrous reddish gold color, excellent for carving, furniture, and other woodworking purposes. The mazzard is grown for high quality timber in the UK and Europe, however a careful pruning regime carried out over many years is necessary to obtain to good sawlogs or veneer.

Tree Establishment Methods

Planting trees on San Juan Island is an uphill battle. The combination of marginal soils and a ravenous deer population have spelled the doom of many hopeful saplings fresh from the nursery. But it doesn't have to be that way. Once we have brought all of our knowledge and judgement to bear on the matter of what to plant where, we must still take care to protect these living investments.

Nursery stock should be carefully examined for cuts, wounds, broken roots, broken branches, etc. The best planting material for deciduous trees is generally young and vigorous, 1'-5' in height, and bare root. Conifers and broadleaved evergreens are usually kept in pots as their dormancy may not be reliable enough for bare root shipping and storage, look for these in 'tree bands', tall narrow pots that encourage a long taproot for drought tolerance. Larger trees are commonly used in the landscape trade for instant effect, however these are not only much more expensive but take much more labor to plant and tend to establish more slowly than younger specimens, and are impractical for agroforestry purposes. It is not uncommon for a smaller tree to outgrow a much larger one planted at the same time.

- **Planting the tree**

If the tree is in a pot, it is beneficial to shake loose most of the potting soil and either mix this into the hole or set it aside elsewhere, so that the roots come into more contact with the native soil of the site. If this cannot be done, loosen the soil around the sides and bottom of the root ball by hand or use a knife. Any encircling roots should be laid out straight or trimmed shorter if too long. Plants kept in pots too long often develop encircling roots and will strangle themselves if this is not corrected. Any broken or ragged root ends (more often seen on bare root stock) should be trimmed clean with a sharp knife

Using a sharp spade or a mattock if the soil is rocky, dig a hole at least 50% wider and deeper than the roots of the tree. The greater volume of soil you can loosen the better, within the limits of time. If there are many long, floppy roots, make a conical mound in the middle of the hole and spread the roots over this, radiating outwards and downwards. Putting the tree at the proper depth is critical- one of the most common mistakes in tree planting is planting too deep. Look closely at the stem where the roots end and the trunk begins. In most trees you will

see a change in color where the bark transitions from root to trunk, at the least you will see where the uppermost root is located. This transitional zone should be right at the soil surface, with the uppermost roots branching off just below the surface. In many cases, a tree planted too deep will die.

The soil type and drainage are important considerations here; if the soil tends to become soggy in winter, then most trees will benefit from planting on a mound of at least a few inches (this will require extra soil from somewhere). If the soil is well-drained, or if the species being planted has a good tolerance for waterlogging, then this is not necessary.

Any amendments or fertilizer should be added on the surface after planting, not inside the planting hole; direct contact between roots and fertilizer can be harmful. Winter rains will wash the nutrients down into the soil where they will become available to the roots.

Mulch is usually beneficial when carefully applied: spread around the tree in a 2'-3' radius, but leaving about 2" clear from the trunk (mulch on the trunk can cause rot). Cardboard is a good base layer to suppress grass and weeds but must be staked or weighted down. Rotten straw, sawdust, woodchips, and used animal bedding are good but should not be applied more than 2-4" thick. Plastic mulches are not advised, they interfere with soil biology and weeds will eventually grow on top of them.

In areas where voles live, almost anywhere with swaths of long grass, the turf should be scalped back all around the area to be mulched and wood chips or pea gravel laid directly on the soil, still leaving a gap immediately around the trunk. It may also be necessary to enclose the base of the trunk with a collar of fine mesh hardware cloth or rigid plastic about 8" high and 6" wide. This will prevent voles chewing the bark at the base of the trunk while the tree is young and vulnerable. It is important to remove this collar before the trunk is deformed by it. Apples and other fruit trees in the Rosaceae family seem to be the most attractive for bark feeding by voles.

● **Protection from deer and livestock**

The deer population of the San Juans has grown abnormally high in the absence of large predators and with low hunting activity. Their effects can be seen on plant life almost everywhere, generally at the preferred browsing height of 3'-4' but higher or lower where there is something very nutritious. Bucks also rub the velvet from their antlers on small trees with smooth trunks, usually 2"-4" in diameter, and this can cause serious damage or even death. A stout fence at least 7' high around a large area in cultivation is the best method for long term deer protection, especially where bushes and small fruit trees are involved. Where the trees to be planted are larger or more vigorous, a tree cage or tree tube may be sufficient for the first 5 years or more until the foliage is well above browse height.

A tree cage may be made in many ways, but the best method uses two 6' T-posts driven at least 18" inches into the ground, and a 3'-4' section of 5' or 6' tall welded wire fencing (12.5 gauge) rolled into a cylinder between the T-posts, secured with fence clips or twisted wire. It may be helpful to leave a gap of up to 6 inches between the ground and the bottom of the cage, to allow for pulling weeds and adding mulch.

Tree tubes (aka tree shelters) are less commonly used here, but given their wide use in other areas with similar climates and deer predation, there is no reason to think they cannot work here. 5' Tubex Combitubes appear to be a good choice, and 500 are now in trial on a 20 acre property here. Durable wood or metal stakes are necessary, and in shallow soil or wet soil

staking may be challenging. Tree tubes are can be much cheaper than caging both in terms of materials and labor to install. The tube also provides protection from voles, being buried 1"-2" deep around the base of the tree.

Goats and sheep can inflict much worse damage than deer even when rotated every 3-4 days; they are still in confinement with far less choice of browse than the deer. In winter they may strip bark from trees large and small, although large trees are less likely to be killed outright by this behavior. Feeding tree fodder including thick branches can help alleviate this problem, by providing an alternative source of bark. Wrapping hardware cloth around trunks will prevent barking, however care must be taken to remove or adjust the hardware cloth before it girdles the tree. Cattle and horses are capable of inflicting serious damage by rubbing and trampling as well as browsing. Pigs will likewise damage young trees by grubbing and chewing. A stout tree cage would probably provide sufficient defense against livestock, while a tree tube could more easily be pushed over by rubbing. However, even unprotected plantings, if oriented in rows, can be effectively grazed by moving portable electric fencing between the rows. Damage to the soil from excessive compaction by hooves will damage tree roots as well; well-planned rotational grazing must go hand-in-hand with agroforestry systems.

- **Fertilization**

Most plants are limited by mineral deficiencies, most commonly Nitrogen. Our native soils on San Juan Island tend to be deficient in calcium and phosphorus among other things, partly due to leaching from the winter rains and partly to deficiencies inherent in the parent material. Calcium (aka 'lime') is a particularly important nutrient for a number food crops including grapes, figs, walnuts, and mulberries. However, excessive amounts of fertilizer can do more harm than good so moderation is key. The best course of action is to obtain soil tests and apply amendments accordingly, but even in the absence of a soil test we can apply fertilizers carefully. Organic fertilizers are advised, there are plenty to choose from and the risks of over-applying are more limited. Kelp, azomite, and other fertilizers of marine origin have the advantage of carrying the full spectrum of 90+ trace minerals, these are all beneficial for plant and animal life in the proper trace amounts. Sea Crop is a liquid amendment, essentially seawater with the Sodium removed, and can be applied directly during the growing season to supply trace minerals with only a small amount of nitrogen. Excess nitrogen is a common issue in cultivated plants and causes an abundance of weak, sappy growth prone to aphids and other pests and diseases.

The most readily available fertilizer is urine, either fresh or stored. It can be applied directly when the soil is moist and plants are growing (including winter for cool-season grasses), but should be diluted by at least 10 to 1 with water when the soil is less than fully moist. It is a potent source of nitrogen, phosphorus and other minerals, and should be used sparingly to prevent nitrogen burn. Heavy feeders like maize, tomatoes, peaches, bamboo, comfrey, willows, and poplars will respond well. A good starting point for application is a few ounces per week on a given plant or tree during the growing season, frequent light applications being better than infrequent heavy ones.

Further Reading and Other Resources

- **Books**

[The Farm as Ecosystem](#) by Jerry Brunetti

Silvopasture by Steve Gabriel

Plant Technology of the First Peoples of British Columbia, by Nancy Turner

Food Plants of Coastal First Peoples, by Nancy Turner

Ancient Pathways. Ancestral Knowledge: Ethnobotany and Ecological Wisdom of Indigenous Peoples of Northwestern North America by Nancy Turner

Creating a Forest Garden by Martin Crawford

Trees for Gardens, Orchards, and Permaculture by Martin Crawford

Shrubs for Gardens, Agroforestry, and Permaculture by Martin Crawford

Trees of Power by Akiva Silver

Restoration Agriculture by Mark Shephard

Wild Plants of Seattle by Arthur Lee Jacobson

Permaculture: Principles and Pathways Beyond Sustainability by David Holmgren

The Dry Gardening Handbook by Olivier Filippi

Rich Earth Institute Manual for Home Use of Urine as Fertilizer:

http://richearthstitute.org/wp-content/uploads/2019/12/Home-Use_Manual_05.pdf

● Nurseries

Burnt Ridge Nursery, Onalaska, WA. Mail-order nursery with wide selection of fruits, nuts, and other useful trees, vines, and shrubs. Owner Michael Dolan and family manage 20 acres of diverse and productive orchards, worth arranging a visit in person.

Fourth Corner Nursery, Bellingham, WA. Wholesale native plant nursery, also carries a few non-native species. Great source for large quantities of bare root stock, good quality at a low price. Plants must be picked up in person.

Cloud Mountain Nursery, Everson, WA. Retail nursery with good selection of fruit crops for Northwest Washington, especially wine and table grapes. Annual taste-testing festivities in fall (COVID notwithstanding)

Birkemeier Nursery, Canby, OR. Wholesale grower of hazelnuts for nut production. Good source for large hazelnut plantings, but must pick up in person.

One Green World, Portland, OR. Retail/ Mail-order nursery with wide selection of fruit and nut trees, unusual edible perennials. Good selection of seaberries (aka seabuckthorn).

Northwoods Nursery, Molalla, OR. Wholesale arm of One Green World, decent selection of fruit trees and shrubs, good quality.

Raintree Nursery, Morton, WA. Retail/Mail-order nursery, wide selection of tree fruits, many obscure varieties well-suited to PNW.

Seven Oaks Native Nursery, Albany, OR. Wholesale native plant nursery, will ship. More southerly drought-tolerant natives than commonly carried at Fourth Corner, leaf-blotch-resistant aspen available.

Cold Stream Farm Nursery, MI. Mail-order nursery with a good selection of hardy trees less available in PNW, such as black locust, hybrid poplars, crabapples.

Cistus Nursery, Sauvie Island, OR. Retail/mail-order nursery with a wide selection of fascinating unusual trees and shrubs collected from across the globe. Plants small but good quality.

The Desert Northwest, Sequim, WA. Mail-order nursery specializing in drought-tolerant plants, many rare and unusual selections.

- **Tools and Materials**

Skagit Farmers Supply. Good source for fencing, grass and clover seed, organic amendments in bulk. Burlington Country Store is the primary retail outlet, good customer service compared to Coastal Country, Tractor Supply, etc.

Steuber's Distributing Co. <http://steuberdistributing.org/> Nursery and farm supplier, good source for pots, potting soil, greenhouse materials.

Baryonyx Knife Co. <https://www.baryonyxknife.com/> Importer of quality hand tools including billhooks. Rinaldi brand of Italy is highly recommended.

Scytheworks, Victoria, BC. <https://scytheworks.ca/> Good source for quality scythes and other tools.