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# Oregon Grape Root Market Analysis

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A Business Planning Guide for  
Small Woodland Owners

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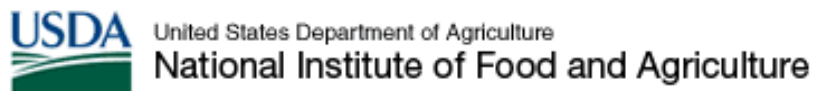
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**Cover Art:** Photo of dwarf Oregon grape plant (*Mahonia nervosa*) by Lita Buttolph, 2010.

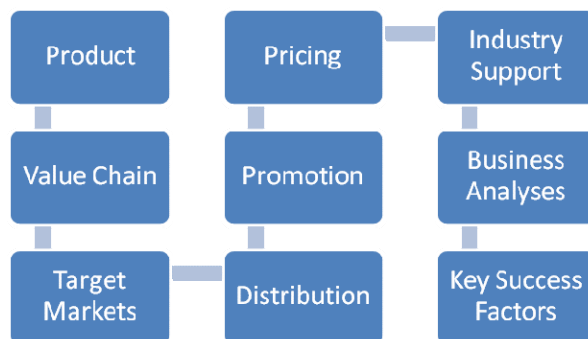
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## Introduction

This analysis provides guidance in assessing the potential market value of Oregon grape plant root (*Mahonia* spp.) produced in a small to medium sized private temperate forests. The contents are oriented toward the small woodland owner entrepreneur seeking to develop a business plan for their forest system that includes management of Oregon grape in a wild, semi-wild or lightly cultivated form for commercial sale. This analysis does not attempt to provide information for commercial production in an artificial (e.g., greenhouse) or large-scale monoculture growing environment.

Parts of the Oregon grape plant can be harvested and sold in many forms. The root and stem have commercial value as a medicinal. Stems and leaves can be harvested for floral greenery. Whole plants can be uprooted, placed in pots and sold as nursery stock. The inner bark of thicker stems and roots can be used to make yellow dye, while the berries can be used to make purple dye. The berries are also edible (although tart with large seeds) and can be used to make jelly and wine.



The primary focus of this report will be on the harvesting and sale of roots for use as a medicinal herb, but the reader should keep in mind that much of the information in the report is equally applicable to non-medicinal production of the plant for commercial sale. Likewise, much of the information provided in this report may be applicable to other nontimber forest products, especially those used for medicinal purposes. Other uses of Oregon grape (such as for floral greenery, food, natural dye, nursery stock) are described briefly in the appendices of this report. Readers are encouraged to refer to other market analyses produced in this series, found at [www.ifcae.org/ntfp](http://www.ifcae.org/ntfp), for more detailed descriptions of nontimber forest products used in the floral, wild food and nursery industries.

## Product – Oregon Grape

Oregon grape roots, stems, leaves and berries can be sold in bulk in raw, unprocessed form. In addition to this primary product, producers interested in adding value to their product could explore various Oregon grape-derived products, such as:

*Processed Medicinal Products.* Oregon grape is sold for anti-bacterial and other medicinal uses and is subject to quality control regulations produced by the Food and Drug Administration. Local governments may have additional rules. Medicinal products derived from Oregon grape include tinctures, powders, teas, decoctions, oil infusions and skin ointments.

*Other Consumer Products.* These are products meant for everyday use and include natural plant dyes, Oregon grape berry jellies and wines. It is also sold in both wild and cultivated form for landscaping as a low-maintenance, drought-resistant shrub. The

stems and leaves can also be used as background greenery in floral decorations and holiday wreaths.

*Community Supported Forest Agriculture*, a new term, is much like the popular Community Supported Agriculture. A community supported forest farm is supported by members who pay a fee to receive some tangible benefit, such as access to medicinal or ornamental greens. The small woodland owner uses the membership fees to offset forest management costs and produce a reliable revenue stream. See Appendix B .

*Education and Agritourism*. Because Oregon grape grows naturally in Pacific Northwest forests, the experience of identifying, harvesting and sometimes processing has been offered in wild medicinal and natural health guided tours. The idea of 'agritourism,' where visitors visit farms and sometimes help with the farm work could also be applied to forestlands, where visitors might help gather a variety of nontimber forest products, including Oregon grape.

**KEY POINT** ~ A small forest-owner seeking to establish a profitable enterprise around Oregon grape should consider whether and how the various secondary products can be leveraged to improve revenue.

## Medicinal Value of Oregon Grape Root

The soft, inner bark of Oregon grape roots (rhizomes), the stems and possibly the leaves contain several alkaloids (most notably berberine, which gives the roots and inner stems their yellowish color) that are known for their anti-inflammatory and anti-bacterial properties. Extracts of Oregon grape, taken internally or applied externally, have been shown to treat infections from viruses (herpes, hepatitis), bacteria, fungi (*Candida*) and protozoa (amoeba, *Giardia*, malaria) (Drum 2000). Oregon grape has become an important substitute for goldenseal, an east coast species, which has become threatened due to overharvesting and loss of habitat. The tannins in Oregon grape also are reported to reduce inflammation and irritation of the eyes, skin, throat, nose and digestive tract, thus making it useful in treating conjunctivitis, eczema, psoriasis, sore throat and sinus infections. It is also used as a liver stimulant (Moore 1993, Drum 2000).



A cut section of tall Oregon grape root (*Mahonia aquifolium*) showing bright yellow berberine alkaloid.

Several studies have been conducted on Oregon grape that show its efficacy as a medicinal herb. In 1992, the first clinical study of Oregon grape for the treatment of psoriasis was conducted by German researchers (Wiesenauer 1992). They found that topical application of a homeopathic ointment containing Oregon grape (*M. aquifolium*) resulted in significant

improvement of psoriasis in over 70% of patients. Several subsequent studies have found similar improvements in psoriasis patients using Oregon grape root (Muller and Ziereis 1994, Geiler et al. 1995, Muller et al. 1995, Wiesenauer and Ludtke 1996, , Bezakova et al. 1996, Brinker 2005, Berstein and Donsky 2006). A study of British Columbian native peoples by McCutcheon et al. (1994) found *M. aquifolium* to have strong antifungal properties. Other studies have found Oregon grape root to have antimicrobial properties (Abascal and Yarnell 2002, Slobodníková et al. 2004).

## Oregon Grape Species

When reading Latin scientific genus and species names keep in mind that even though a species has been given a name it could change in the future. Taxonomic science periodically makes adjustments as new research improves our understanding of a given species. Sometimes a species turns out to be in a different genus altogether than what it was originally thought to be or sometimes plants thought to be one species turn out to be two species. Common names are those that the non-scientists typically use. They can be widely variable depending on where you live and other factors. For example, in looking through 20 different reports and books *Mahonia aquifolium* is called Oregon grape, mountain holly and barberry, but in other books those names are applied to *Mahonia nervosa*. In this report, we have used the prevailing scientific names and the common names that are most often used with a particular species. Still, if you are placing a large order for seed, starts or other products we advise you to discuss the names (including the scientific name) and describe the species with the supplier to help reduce the risk of mistakes.

This report focuses on the four dominant species of Oregon grape that naturally occur in western North American forests. All four species contain the active compound berberine (Moore, 1993). Tall Oregon grape (*Mahonia aquifolium*) is the more commonly listed species in herbal products, but *Mahonia nervosa* is also widely used. *Mahonia repens* and *Mahonia pinnata* are also used but less commonly. Unless otherwise noted, this research focuses primarily on *M. aquifolium* and *M. nervosa*. Two useful photo guides for identifying species present are the Oregon State University Landscape Plants website<sup>1</sup> and the University of Washington Herbarium website<sup>2</sup>.

Table 1. Selected Oregon-grape species		
Common names	Scientific name	Site Conditions
Oregon grape, tall Oregon grape, hollyleaved barberry	<i>Mahonia aquifolium</i> , <i>Berberis aquifolium</i>	Partial sun to shady forested sites
Dwarf Oregon grape, Cascade Oregon grape, dull Oregon grape	<i>Mahonia nervosa</i> , <i>Berberis nervosa</i>	Partial sun to shady forested sites
Creeping Oregon grape, creeping Mahonia, creeping barberry, prostrate barberry	<i>Mahonia repens</i> , <i>Berberis repens</i>	East of Cascades on dry sites, higher elevations, forest edge, disturbed sites

<sup>1</sup> <http://oregonstate.edu/dept/ldplants/1plants.htm>

<sup>2</sup> <http://biology.burke.washington.edu/herbarium/imagecollection.php>



**California barberry, California holly grape, shinyleaf Mahonia, California Oregon grape**

*Mahonia pinnata*,  
*Berberis pinnata*

Primary in California, from San Francisco to Baja. Dry, rocky, exposed forests and shrublands

### Tall Oregon grape (*Mahonia aquifolium* (Pursh) Nutt.)

Tall Oregon grape, also known as hollyleaved barberry, mountain grape and mountain holly, is found in forests from northern California to British Columbia, generally below 4,000 ft (1200 m) elevation. This evergreen shrub typically grows from 2 to 5 ft (0.6 to 1.5 m) in height, but has been known to grow to as high as 15 ft. Leaves are composite, with a red central vein and 5 to 11 leaflets per leaf. The leaflets are holly-like, alternate, dark-green and shiny on top and dull-green and fuzzy underneath with serrated, barbed teeth. Flowers bloom in late spring and are shiny yellow, with 5-10 petals in 2-4 whorls, and often occurring in erect clusters. The fruit is a round to oval-shaped blue-black berry, about 0.4 inches (1 cm) in diameter, edible with a sour/sweet flavor and sometimes having a bitter aftertaste. The roots grow to 0.5 to 1 inch in diameter and are dark yellow to orange in color. Older leaves may turn orange or red, especially with sun exposure. (Source: Moore 1993).



Tall Oregon grape (*Mahonia aquifolium*).

### Dwarf Oregon grape (*M. nervosa* (Pursh)



Dwarf Oregon grape (*Mahonia nervosa*).

Dwarf Oregon grape, also known as dull or Cascade Oregon grape, is commonly found in Douglas fir or Western red cedar forests from central California to southern British Columbia, and a small pocket of northern Idaho. It is lower-growing than tall Oregon grape (*M. aquifolium*), generally reaching only about 1 to 2 ft (30 to 60 cm) in height. It is often a dominant understory species in semi-open forests and also in open areas bordering coniferous forests. The plant has a short, single main stem that, when mature, is covered with a rough, scaly, reddish-brown bark. Leaves emerge directly from the main stem, and are alternate and pinnately compound. Nine to 19 leaflets can be found on each leaf and are toothed and somewhat shiny, but less so than tall Oregon grape.

The leaflets lack a central main stem, but instead have 3 to 5 fan-like branching veins. Leaves may turn orange or red in the fall, especially with sun exposure. Flowers are small and yellow, emerging along a long stalk (raceme). The fruit is a

small berry (3/16-inch in diameter), dark blue in color and edible but very sour (Sources: Tirmenstein 1990, Moore 1993).

**Creeping Oregon grape (*Mahonia repens* (Lindl.) G. Don)**

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Creeping Oregon grape, also known as creeping Mahonia, creeping barberry or prostrate barberry occurs throughout western North America from the southwestern U.S. (western Texas, New Mexico, Arizona) and northern Mexico, into the Rocky Mountains to British Columbia and Alberta. It also includes some parts of California and Nevada. It is a low-growing evergreen shrub that grows from 4 to 12 inches (10 to 30 cm) in height. The stems are prostrate and mostly unbranched, green when young and reddish-brown when mature. The holly-like leaves are alternate and pinnately compound, ranging from 5 to 7 inches (13 to 18 cm) in length, with 3 to 7 leaflets per leaf. The leaf shape is oblong to round. The dark green leaf tops turn reddish-purple in the winter. Flowers are small and yellow and emerge in clusters along a long stalk (raceme). The fruit is a small berry (1/4-inch in diameter), waxy, dark blue in color and edible but sour. Creeping Oregon grape can be distinguished from the other two species by its low stoloniferous growth form (i.e., forming multiple basal stems), smaller root diameter and less serrated leaves. Also, *M. repens* only occurs east of the Cascade Mountain range. (Sources: Moore 1993, Fillhart and Policha 2009,).



Creeping Oregon grape (*Mahonia repens*)

**California barberry (*Mahonia pinnata* (Lag.) Fedde)**

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California barberry, also known as California holly grape, shiny leaf Mahonia or California Oregon grape, is found most commonly in open forests and rocky ridges from north-central California to Baja. This upright evergreen shrub can grow up to 15 ft in height, but most commonly grows to about 5 ft (1.5 m). Leaves are pinnately compound, alternate with 7 to 11 leaflets per leaf and grow in dense clusters. The leaflets are holly-like, glossy, extremely spiny and can be twisted or wavy in form. The flowers are small and light-yellow, occurring in clusters of 20 to 50 on a raceme. The fruit is a small, purple berry that is very sour, but edible. (Sources: Moore 1993, <http://oregonstate.edu/dept/ldplants//mapin.htm>).



California barberry (*Mahonia pinnata*)



## Supply and Demand

In the early 1990s the botanical trade for wild and cultivated medicinal plants became a multibillion dollar industry in the United States, largely driven by the herbal supplements boom. North America represented 12% of the global sales of medicinal herbs in 2001 (Strategic Reports Inc. 2003). Markets have fluctuated over the past 10 years, but show a general trend toward growth (Cavaliere et al. 2009). Cavaliere et al. (2009) report on data collected by Nutrition Business Journal that found that annual sales of herbal supplements grew by 4.8% to over \$5.03 billion in 2009. Direct sales of herbal supplements captured 50% of the market share (\$2.5 billion), while sales via mass market and natural food stores captured 17.5% and 32.6% of the market share, respectively. Newsweek magazine attributes the growth in the vitamin and herbal supplement industry to the recession (e.g., consumers substituting herbal supplements for expensive prescription medications, the loss of health insurance) and a growing interest in health and wellness by an aging Baby Boomer generation (Gross 2009). With increased consumer interest in sustainability, natural remedies and local suppliers, there is opportunity for regional sales growth, particularly if paired with partnerships between government, doctors, expert botanists and herbalists to promote education and use.

One factor that can affect the market demand for an herbal product is clinical research conducted on a particular product. These clinical studies can positively or negatively affect consumer demand for a product, depending on the results. The American Botanical Council<sup>3</sup> is an independent, nonprofit research and education organization that provides current information on medicinal herb research, including a library and on-line database of publications. Another factor is coverage of a product in the press, on television and in other popular media.

Both domestic and international markets exist for Oregon grape but trade databases on domestic consumption and foreign exports are nearly nonexistent. The only medicinal plant with a U.S. Harmonized System Code (aka Schedule B Code)<sup>4</sup> is ginseng, which has codes for wild and for cultivated. All other raw plant products harvested and processed as medicinals are lumped under one code, 1211.90.9125: "Substances having anesthetic, prophylactic or therapeutic properties and principally used as medicaments or as ingredients in medicaments."<sup>5</sup> A specific code can be requested but unless it is a known product traded in large quantities (e.g., wheat) or has a specialized tracking system to verify amounts like the licensing system for ginseng, a specific code is unlikely to be produced. The collective tonnage of Oregon grape produced for sale isn't exactly known, but information from sources such as searches on the Internet and browsing herbal product stores clearly shows that Oregon grape

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<sup>3</sup> <http://abc.herbalgram.org>

<sup>4</sup> The Harmonized System is an internationally recognized 6-digit system of codes used to classify imported and exported products. Export codes are also referred to as Schedule B numbers and are administered by the U.S. Census Bureau, while import codes are administered by the U.S. International Trade Commission. More information about the Harmonized System is available at [http://export.gov/logistics/eg\\_main\\_018119.asp](http://export.gov/logistics/eg_main_018119.asp).

<sup>5</sup> <http://www.zepol.com/HTS-Export/1211909125.aspx>, accessed May 23, 2011.

is sold widely in raw and processed form. People in the industry can give you a sense of market outlets, amounts and prices.

Several sources in the commercial industry suggest that the majority of domestic Oregon grape root purchased for the medicinal market stays in the U.S. They say that in a typical year, annual unprocessed dried Oregon grape root sales range from 20 to 30 tons or up to \$240,000<sup>6</sup> at 2010 prices (Anonymous buyers personal communication 2010). Because of the relatively small market, Oregon grape root is easily over-supplied, which can drive down prices. However, at the time of this writing one supplier indicated that he was having trouble meeting the demand and indicated that if he had more working capital he could increase his production significantly. Thus, demand, could vary depending on the buyer.

The price and demand for Oregon grape is influenced by the markets for other berberine-containing medicinals. Goldenseal (*Hydrastis canadensis* L.), for example, which grows in the eastern U.S., is a popular medicinal plant that also contains berberine, among other medicinal compounds. Since 1991, several states have listed goldenseal as threatened or endangered due to overharvesting. The demand for Oregon grape has increased as a result of the decline in availability of goldenseal and an increase in price for goldenseal will often result in a higher price for Oregon grape. An untapped export market could also be developed for Oregon grape, since wild crafted goldenseal cannot be exported due to its threatened listing.

**Key Point.** Although trade data or other well-documented sources of information about the size and value of the Oregon grape industry is lacking, clearly there are markets and it appears that demand is on the rise again after declining from a peak in the 1990s.

## Value Chain

Perhaps the most important activity any potential business owner can engage in is the planning of all activities and required investments. Understanding the value chain of a product is important to the business planning process because it helps to identify the costs, equipment, resources and staff that will be required. It walks the small woodland owner through all steps, from production to sales.

The value chain of a product, such as Oregon grape root, is the path that a product follows from procurement through processing through delivery to the final customer. A sample value chain diagram is provided in Appendix D. The sample demonstrates one scenario for a system based on a simple wild harvesting with few inputs. Businesses with more processes, such as making herbal extracts, will have more steps in the value chain.

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<sup>6</sup> This value is calculated based on an estimated average price per pound of \$4 for unprocessed dried Oregon grape root.

### Wild versus Cultivated

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This analysis is intended to promote the planning of wild and semi-wild cultivation within integrated forest systems. By using the terms “wild” and “semi-wild”, we generally mean the small woodland owner will only be doing minor management of the target species, but not so much as to be considered cultivation of a monoculture crop. The following discussion elaborates a bit on why it can matter if a product is wild, semi-wild or cultivated. As you read keep the following two points in mind:

- 1) In general cultivated species require more time and resources to produce
- 2) “Wild” can be a market niche

Some buyers or certifying agencies may insist that products be grown under “wild” conditions. However, determining when management practices reach a level where the species is “cultivated” can sometimes be difficult.

The term “wild” is based on the assumption that a species exists in nature with no human involvement. In truth, however, many of what we consider “wild” species have been actively managed and tended by humans for millennia through the use of fire or other low-input methods. For example, the oak woodlands of California and Oregon were actively managed by indigenous peoples through the use of fire to maximize acorn production (Anderson 2006). Anthropologists use the term “tending” to refer to non-intensive management practices that encourage the productivity of a particular species. Ford (1985) describes “tending,” as “the minor modification of environments to encourage the growth of naturally occurring plants in situ, while plant “cultivation” involves a more intensive and extensive pattern of environmental modification.”

Some nontimber forest products (e.g., Oregon black truffle) that are commercially harvested cannot be cultivated and are harvested as wild species though there may be active management of the forest lands by the landowner. A completely wild product would have no management activities associated with production. Such wild products are rare. They might include, for example, chanterelle mushrooms harvested from public Forest Service lands that have not been logged in decades. Even in this example, however, a harvester may deliberately or non-deliberately spread spores when harvesting.

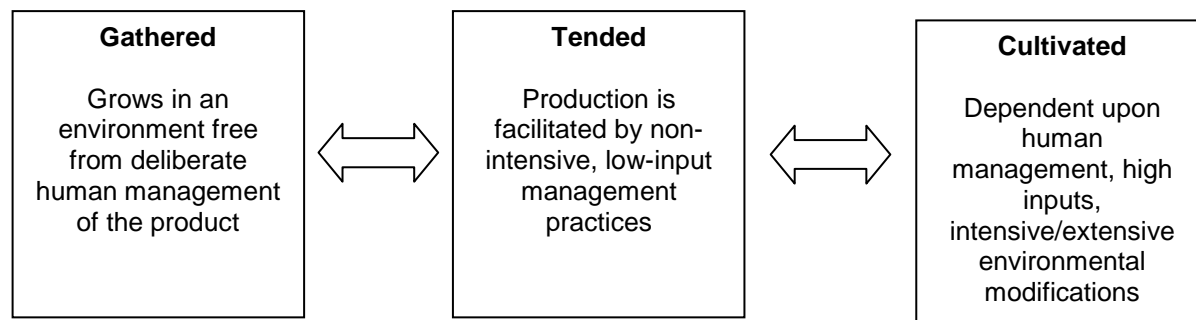
Some products have wild and cultivated counterparts that are both harvested for market, for example, ginseng. Wild ginseng has a higher market value than cultivated ginseng. Some people grow ginseng in a wild-simulated setting, that is, in beds under a forest canopy as opposed to growing it in monoculture farms and greenhouses. Most wild-simulated ginseng operations are not completely wild because the process may involve management activities such as planting, watering, weeding and thinning.

Ultimately it is up to the landowner to decide how much energy and inputs he/she wants to invest in growing a product. When you think about building a commercial business around nontimber forest products it's useful to consider where the species occurs on the continuum between wild and cultivated. Ask yourself questions like: Am I dealing with a species that cannot be cultivated (e.g., Oregon black truffle)? If the species has wild and cultivated

markets what are the management requirements for each?

It may be helpful to look at nontimber forest products as falling somewhere along a continuum from those that are simply gathered with no management to those that require active cultivation. The following diagram illustrates this continuum. Our recommendation is ultimately to strive for low-input management practices that promote the long-term sustainability of the crop and natural system.

Diagram 1. A continuum representing the level of management from gathered to cultivated.



### Preparation

Prior to initiating any enterprise having to do with medicinal herbs, the small forestland owner should spend a little time trying to learn about specific guidelines, laws and regulations pertaining to growing, collecting, processing and/or marketing of Oregon grape or other medicinal products. Your local extension agent may be able to do some of this legwork for you. You can find one by visiting [www.extension.org/ask](http://www.extension.org/ask) or searching the Internet for "extension agent" and including your county and state name. Another good resource is the American Herbal Products Association (AHPA)<sup>7</sup>, a national trade association and advocacy group for the herbal products industry in the U.S. One document produced by AHPA and the American Herbal Pharmacopoeia (AHP)<sup>8</sup> is a book of guidelines for growers and collectors<sup>9</sup> of herbal products, entitled "Good Agricultural and Collection Practice for Herbal Raw Materials." Available free on the AHPA website<sup>10</sup>, this document outlines "best practices" including guidelines for propagation, site selection, collection equipment, plant identification, sustainable harvest, post-harvest handling, personnel, record-keeping, and retention samples. The information may or may not apply to your specific situation but it provides a starting place to help you think about what your sustainable management plan should be.

<sup>7</sup> <http://www.ahpa.org>

<sup>8</sup> <http://www.herbal-ahp.org/>

<sup>9</sup> Collectors or harvesters of wild medicinal herbs are often referred to as 'wildcrafters.'

<sup>10</sup> [http://www.ahpa.org/Portals/0/pdfs/06\\_1208\\_AHPA-AHP\\_GACP.pdf](http://www.ahpa.org/Portals/0/pdfs/06_1208_AHPA-AHP_GACP.pdf)

Every farmer and forester of Oregon grape will share some common issues as well as have their own unique variables. Read all you can and talk to your peers as much as possible, but above all make and record observations about what you do and what you see in your production system as that will be invaluable data for you and those that come after you to help guide sustainable management.

The following information in this section is drawn from the AHPA guidelines, with the addition of information that is specific to Oregon grape.

The species that will best thrive in a given small forest depends on a number of factors listed below:

- Presence of established populations – It will be most cost-effective to market Oregon grape that already exist on your land.
- Soil type – Oregon grape grows best on moist, well-drained, acidic soils.
- Sun exposure – Oregon grape will grow in full sun if the soil is kept moist, but does better with light to moderate shade. *Mahonia aquifolium* does better in direct sun than *M. nervosa*. A dense tree canopy cover will typically reduce production.
- History of fire – Fire tends to encourage growth of Oregon grape.
- History of logging – Oregon grape will grow better in areas recently logged.

A survey of the property should be conducted to assess what species and conditions are present and the extent of management that will be needed. If you are planning for a timber cruise then ask that Oregon grape and associated vegetation be included in the cruise if possible, otherwise you can do a lot yourself by walking your land and noting:

- Where Oregon grape occurs. If you have a GPS (global positioning system), take a waypoint so you can easily return to the same spot for future observations.
- What the quality appears to be. If you don't know what quality to look for then you can take a range of samples and share them with a commercial buyer for feedback.
- General abundance in each area
- Associated vegetation
- Soil types characteristics (e.g., high clay, poor drainage)
- Canopy density and shading
- Any history you know about the location (e.g., a fire, clearcutting, planting)

On properties with established Oregon grape you may be able to begin harvesting and processing to generate immediate and sustained revenue. New plants take from 3 to 5 years to reach their ideal harvest size, depending on site conditions.

Based on the expected productivity of Oregon grape on a specific property, the small woodland owner can get a rough idea of how many plants (or total cover or density) are necessary to make the venture financially worthwhile. One you have done an inventory of your existing plants and an estimation of how many new areas you can open for production you can harvest a few to get a sense of the average yield/poundage you can expect, adjusting for factors such as the age/size of plants you think you will be harvesting.



If you are harvesting Oregon grape for medicinal purposes you will be harvesting the root. This generally means pulling the plant up, but as it has runners underground like blackberry it's difficult to remove the whole plant. You may or may not see regeneration off any leftover root stock in the ground but you probably will if you cover exposed roots and the growing conditions are generally favorable.

The rate of regeneration is a factor in estimating your revenue over the years but the rate will in part depend on how aggressively you harvest and the care you put into creating favorable habitat conditions for future growth. It may be that the amount of Oregon grape found on your property is enough to produce a good harvest the first year, but then you may need to wait several years (2 to 8 years) for the next harvest. Alternatively, if a landowner chose to harvest less than the total potential harvest amount, then harvesting might be done more frequently. It is important to note, however, that the forest structure and composition may change over time, particularly if there are trees present, and that conditions that may be favorable for growing Oregon grape one year may change as the forest matures.

In general, the larger the plant or cluster of plants, the greater the yield. A rough estimate of the yield from an individual plant ranges from 1 to 10 pounds fresh weight including stem parts (Amy Grotta personal communication, Nov. 4, 2010). Some individuals have reported harvesting up to 50 lbs from a single *M. aquifolium* plant. *Mahonia nervosa* is much smaller and harder to feed into many types of chippers, so you can assume that the yield versus time and labor in harvesting and preparing will be lower than *M. aquifolium*.

How much Oregon grape you decide to produce will depend on many factors, such as what types of markets you are supplying (e.g., medicinal, transplants, native seeds, decorative), how much habitat you have, the rate of natural seeding or the time and resources you have for seeding and transplanting and other factors that will be discussed more in depth in the next section.

### Insurance

Depending on the scale of your operation and how you structure your labor, securing business and liability insurance may be necessary. The US Small Business Administration provides on its website<sup>11</sup>, an excellent overview of the various insurance types available to a small woodland owner including general liability, product liability, home-based business, internet business and worker's compensation insurances. If you are interested in harvesting from another person's private land or public land, Logger's Broad-Form liability coverage may be necessary. Other sources of information about insurance opportunities specific to small forestland owners can be found through your local woodland or small forestland owner's associations.

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<sup>11</sup> [http://www.sba.gov/smallbusinessplanner/manage/getinsurance/SERV\\_INSURANCE.html](http://www.sba.gov/smallbusinessplanner/manage/getinsurance/SERV_INSURANCE.html)

### Production and Management

Oregon grape produces abundant rhizomes (horizontal, underground stems) that may spread for many yards, forming new genetically identical colonies over a large area. New plants can be propagated by stem or rhizome cuttings (et al. 2001). Cuttings require even soil moisture during early growth. Another method called “layering” is to take an aboveground stem of Oregon grape that is still rooted and lay it down on the ground and use a piece of wood to hold it down. The branch will develop roots and begin to form a new colony. These are the easiest way to increase populations of Oregon grape on a property. New plants can also be grown from seed, but may require more time before the plant parts can be harvested.

In general, *Mahonia aquifolium* tends to grow larger and have a larger, straighter root system than *M. nervosa*, which tends to have thinner, straggly roots. *M. aquifolium* also tends to have a stronger yellow inner bark color, which is preferred by buyers. *M. nervosa*, on the other hand, may be more prevalent in the forest, grow in thick clusters, and although the inner bark color may not be as bright as *M. aquifolium*, preliminary lab studies have shown it to have as much berberine content as *M. aquifolium* (Amy Grotta personal communication June 28, 2011). *M. nervosa* has also been reported to re-root easier than *M. aquifolium*.



Photo (a) shows a stack of bundled *M. aquifolium* roots, which tend to grow larger and straighter than *M. nervosa*, shown in photo (b).

Tirmenstein (1990) reports dramatic increases in yields of dwarf Oregon grape (*M. nervosa*) after light to moderate-intensity fires. Seed sprouting after light-intensity fires was observed, otherwise vegetative production from undamaged rhizomes led to increased production. Prescribed burning to increase Oregon grape production may not benefit a landowner in the short-term, since burning the plant would make it unavailable for harvesting. However, if an area is designated for a prescribed burn for other reasons or if a landowner wished to increase production in a less-productive site, a prescribed burn (preferably in late fall or early spring) might result in a greater long-term benefit. Small, low intensity spot burns or cold burn techniques that target individual plants might be another approach, but as of this writing there was no documentation to show whether those techniques would work specifically with Oregon grape as they have for other plants such as hazel. If prescribed burns are permitted in your area and you are interested in this technique, seek assistance from an experienced professional before attempting to do a prescribed burn on your own. Also insure that the

proper permits, local regulations, and weather conditions are met prior to attempting a prescribed burn.

## Harvest

Although this report is intended for small woodland owners collecting plant material from their own property, in some instances the small woodland owner may need to collect material from other private or public lands if sufficient quantities of Oregon grape are not available on-site. The small woodland owner may also wish to lease out land for harvesting by others. When harvesting is done either on public lands or the private property of others, harvesters should always take care to ensure that they have permission and any necessary permits from the landowner or agency first. In Oregon, state statute 164.813 “Unlawful cutting and transport of special forest products” details requirements for the harvesting, transport and sale of products. Specifically, the statute states that any cutting and transporting of special forest products for sale requires a written permit from the landowner, including the landowner himself when he/she is transporting a product. Specific requirements of the law can be found in a readable format at the Oregon Laws website.<sup>12</sup>

Harvesting on public lands is not a focus of this market analysis, but the small woodland owner should be aware that there are a number of legal considerations should public lands be considered as a supplemental source of Oregon grape. Harvesters are generally required by the local district office to purchase a personal use or commercial permit prior to harvesting, depending on the quantity that they will be removing. Sometimes the local agency will be put out sales of large quantities for bid between competing companies if there is supply and demand. Another possible approach to getting product from public lands is a stewardship contract. A stewardship contract gives some preference to locally based parties. If you are interested in public lands harvesting, contact local Forest Service, Bureau of Land Management, and state agencies by phone or email to find out what the options are for that particular forest as regulations and practices vary.

### Harvest Season.

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The best time to harvest Oregon grape roots and rhizomes for medicinal purposes is in the fall after seed formation, when berberine content is thought to be at its highest, although some harvesters do not harvest until early winter. If the plant is harvested after berries have fallen, then the potential for regeneration is maximized and food for wildlife maintained (Howe 2006).

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<sup>12</sup> <https://www.oregonlaws.org/ors/164.813>

### Harvest Site Selection.

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Some criteria to consider when deciding where to harvest Oregon grape for sale on the medicinal market:

- Generally, sites with abundant stands of Oregon grape should be selected for harvest.
- Harvest larger plants and leave the smaller ones to grow.
- Depending on the quantities you will harvest you may need the harvest site close to a road where you can park a truck, or a site that is accessible by a tractor or ATV.
- Avoid sites where pesticides, herbicides and other chemical applications may have been applied within the past 3 years or any toxic materials may be present (e.g., lead or other heavy metals) (AHPA & AHP 2006). Roads, railways and power line corridors are common places where herbicides are routinely sprayed.
- Insure that water sources near the site are free of pollutants (e.g., not downstream of industrial plants, mines, parking lots, golf courses, underground storage tanks) (AHPA & AHP 2006).

### Species Identification.

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To insure that the correct species is being collected, harvesters should be able to reliably identify Oregon grape species. The best way to get trained is to be mentored by somebody with adequate experience harvesting the plant, and/or commercial buyers, especially ones that will go out in the field with you. The next best sources are reference manuals (e.g., information on local flora), extension agents, botanists/taxonomists and classes on identifying local flora. One resource that explains the identification and documentation process for medicinal herbs is *Good Practices for Plant Identification for the Herbal Industry* by Brigham, Schroder and Cocksedge (2004), available free on-line<sup>13</sup>. Sometimes buyers may require that voucher specimens be kept as a record of harvest. Information on preparing a voucher specimen can be found in the appendix of *Good Agricultural and Collection Practice for Herbal Raw Materials* (AHPA & AHP 2006)<sup>14</sup>. It may be necessary to collect the voucher specimen earlier in the year (during flowering season) rather than at harvest time. If selling to a buyer, check to see whether a voucher is required.

### Harvest Equipment.

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Useful tools for harvesting Oregon grape include sharp pruning shears or a knife, work gloves, a forked tool and collection bags or tarps. Some harvesters use a Pulasky axe, used in fire fighting, to harvest Oregon grape root (see Figure). Its head has an axe on one end and a

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<sup>13</sup> <http://www.saskherbspice.org/graphics/Good%20Practices%20for%20plan>

<sup>14</sup> [http://www.ahpa.org/Portals/0/pdfs/06\\_1208\\_AHPA-AHP\\_GACP.pdf](http://www.ahpa.org/Portals/0/pdfs/06_1208_AHPA-AHP_GACP.pdf)

Pulasky axe



hoe-like blade on the other. It is useful for digging and pulling up the roots. All equipment used for medicinal plant harvesting should be kept clean and free of potential contaminants and other plant species (AHPA & AHP 2006).

### Harvest Technique.

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One approach to harvesting good quality Oregon grape for medicinal purposes is to pull the plants up from the base of the stem by hand or using a pitchfork or Pulasky axe, and clipping roots with pruning shears or sharp knife when the rhizomes stops lifting. Care should be taken to maintain and protect the yellow inner stem portion of the plant (which is the berberine alkaloid). Gently brush off as much dirt, moss, lichen or other debris from the plant as possible, making sure that the outer root bark is not damaged. The harvested material should not be exposed to exhaust fumes and particles from gas engines (for example, gasoline-powered chippers) (Drum 2000).



**M. aquifolium harvested using a shovel. The roots here are fairly shallow and easy to dig up.**

According to Drum (2000) the medicinal qualities of Oregon grape can be compromised by the harvesting technique.

For example, Oregon grape that has been extracted from the earth by heavy earth-moving equipment as a result of logging or road-building operations may be less effective as a medicine if the roots and stems are torn, ripped or damaged in any way.

The stems and leaves are thought to also have medicinal properties, but should be kept separate from roots and rhizomes. The lower stems often contain berberine, (identified by the yellow inner bark) and are often mixed with the roots. Generally, any above-ground stems included with the roots should have the yellowish bark. It is important to check with the buyer prior to including above-ground stem material with roots and rhizomes (Howe 2006).

It is preferable to keep the root length as intact as possible, while taking into consideration the logistics of transporting it out of the forest. If clipping is necessary immediately after harvesting, try to keep the roots at least 3 feet in length.

### Sustainable Harvest

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When harvesting any species from the wild, care must be taken to insure that healthy populations of the harvested species are maintained over time *and* damage to the local habitat is minimized (AHPA & AHP 2006). When extensive, time-tested local knowledge and truly



rigorous long-term scientific studies are lacking on what exactly sustainable care is, at the least consider what a common sense approach would be that won't hurt the plant and surrounding habitat. Write down your observations and pay attention over time so you will have data to help adapt/modify your approach to be more sustainable.

Determining what a "sustainable harvest" might be for Oregon grape will be up to the individual small woodland owner based on site conditions, harvest levels, harvest technique and frequency of harvest. For example, Lonner (2002) conducted a study that compared different harvesting levels of Oregon grape. She found that for the Six Rivers National Forest, the guidelines of harvesting every fourth Oregon grape plant per site over a two-year period was not sustainable over time (Lonner 2002). She recommends that Oregon grape be harvested only where large, healthy populations exist, and then only conservatively (e.g., less than one of every four plants), leaving many neighboring plants on-site to recolonize (Lonner 2002).

To ensure that Oregon grape populations remain stable or increase, the landowner may wish to spread seeds or plant stem cuttings of Oregon grape in the harvested areas. Natural regeneration may also occur if some of the root parts are left in the soil at the time of harvest, but some harvesters report only about 10 percent regeneration. Neighboring plants may sprout new stems.

### Labor

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As in all businesses the type and amount of labor you need to operate will be a central factor. Automated/mechanical options are limited. You could use a tractor or other machine to help pull out the plants but you will want to make sure that what you end up with is satisfactory for the purchaser and is in line with your long-term goals for the harvest site. For example, if you are simply salvaging before intensive logging, the regeneration of the plant from root stock may not be an issue. Regardless of what level of manual labor you require, you will either do it yourself, hire others or find a non-traditional source of labor such as a youth group training program. If you are small and just starting out often the least risky avenue is for you and family members or friends to do the harvesting and production until you learn the system and get a sense for what your labor requirements are in relation to your product output. In all likelihood, if you venture into commercial production of Oregon grape you probably will end up doing additional nontimber forest products that require similar techniques and equipment and share similar outlets. For example, you might find in your inventorying that you have multiple wild medicinals that the same buyer would be interested in. For example, you might have Oregon grape, cascara, huckleberry leaf, usnea and valerian root. The more you produce, harvest and process the more valuable a contribution your nontimber forest product operation will contribute to your household economy and the likelihood increases that you will need to hire additional labor.

Small woodland owners seeking to hire paid labor to harvest wild forest goods such as Oregon grape will have a few options. Three different hiring arrangements are discussed here with their individual costs and benefits: contract labor, employees and staffing agencies.

**Contract Labor**, also referred to as pay-per-piece or independent contractors, are workers paid for what they complete, rather than how much time they spend working. The IRS generally defines the relationship as follows:

The general rule is that an individual is an independent contractor if you, the person for whom the services are performed, have the *right to control or direct only the result of the work and not the means and methods of accomplishing the result.*<sup>15</sup>

For Oregon grape harvesting, contract workers may be paid per pound of Oregon grape harvested. This form of labor allows the small woodland owner to closely tie labor to profitability, as pound sold has a fixed harvesting cost. This labor arrangement protects the owner from paying too much for slow or unproductive workers.

**Employees** are harvesters paid per hour worked, regardless of productivity. Paying workers hourly allows a business owner to benefit from economies of scale, where workers whose harvesting skills improve with experience eventually harvest more per hour, so the harvesting cost per pound decreases over time. Employers are required to pay Social Security, Medicare, unemployment and federal taxes for their employees, and state taxes where applicable.

**Staffing Agencies** provide the simplest and safest solution, though it is also the most expensive. Temporary workers hired through a staffing agency are employees of the agency, which typically handles all of the employment-related paperwork, filings, taxes and insurance. The workers are typically paid minimum wage and the small forest owner pays a rate that is some percentage greater than the employee's rate.

The decision whether to use contract labor, employees or an agency will depend on the experience of the available harvesters, the expected number of pounds to harvest, the risk tolerance of the small woodland owner, the owner's tolerance for paperwork and other factors. The table below lists some of the requirements for each type of worker arrangement. Items listed as not applicable (n/a) are often included in staffing agency agreements.

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<sup>15</sup> <http://www.irs.gov/businesses/small/article/0,,id=179115,00.html>, accessed 5/18/10

Some Requirements for Labor Type (partial list)	Contract	Employee	Agency
Form W-9, Request for Taxpayer Identification Number & Certification	Yes	Yes	No
Form 1099MISC – Miscellaneous Income	Yes	No	No
Migrant and Seasonal Agricultural Worker Protection Act <sup>16</sup>	No	Yes	n/a
Employer Liability Insurance	Yes	Yes	n/a
Hazardous Substances training (if used)	Yes	Yes	n/a
<b>Due to the complexity of employment law, the small forest owner may be inclined to seek professional assistance. A copy of <i>The Employment Law Guide</i>, issued by the United States Department of Labor, can be found on the web<sup>17</sup>, and the IRS provides guidance online in the <i>Small Business and Self-Employment Tax Center</i>.<sup>18</sup></b>			

The United States' agriculture industry relies heavily on migrant and immigrant labor, and the small woodland owner might find that many of the workers that are willing to contract or apply for positions are from other countries. It is not legal to hire undocumented workers and if a worker is from another country they are required by law to have guest worker documentation or green card. The minimum wage requirements for farm workers varies by state so you should check with your state bureau of labor to learn what the requirements are. Migrant and immigrant laborers are often dedicated, hard workers who may not be fluent in English. The small woodland owner should consider language barriers in their hiring decisions, preferably by identifying a field lead that is bilingual. It is possible to specify the ability to communicate in English when posting the position or working with an agency, but this may restrict the number of applicants.

One potential source of labor might be from crews that are already involved in more traditional forestry activities (e.g. arborists, loggers, brush management companies, reforestation companies). There is a potential to hire these individuals to gather Oregon grape while also performing some other forestry-related work on your land. One advantage of this is that these companies typically carry Logger's Broad Form liability insurance.

Another way to find harvest labor is by contacting herb buyers who have relationships with harvesters and wildcrafters (harvesters of medicinal plants). A lease arrangement could be made with professional harvesters that would allow them to harvest Oregon grape and possibly other nontimber forest products in exchange for an annual use fee. In this case, the wildcrafter might be the one responsible for harvesting, processing and marketing the Oregon grape. Trade or bartering labor or service in exchange for product is another option. For example, a trade could be made between the landowner and harvester for fence repair, firewood cutting, tree planting or thinning in exchange for harvest rights to Oregon grape and other nontimber forest products. Other creative arrangements could also be made between the landowner and harvester.

<sup>16</sup> <http://www.dol.gov/compliance/laws/comp-msawpa.htm>

<sup>17</sup> <http://www.dol.gov/compliance/guide/index.htm>

<sup>18</sup> <http://www.irs.gov/businesses/small/index.html>

Regardless of the labor arrangements ultimately made, all harvesters and handlers of medicinal wild plants (whether employees, contractors or the landowner him/herself) will need to be trained in plant species identification, harvesting techniques, post-harvest handling, as well as hygiene and safety. Hygiene is particularly important to prevent microbial contamination of the medicinal plant (AHPA & AHP 2006). Adequate toilet facilities (such as portable toilets), and hot water and soap at post-handling facilities should be provided. Workers should also refrain from handling the crop if sick, have open wounds, sores or skin infections (AHPA & AHP 2006).

## Processing

Once the Oregon grape roots/rhizomes have been collected, they should be washed with clean, potable water to remove dirt and moss, but with care to avoid removing or damaging the outer bark. Some harvesters are able to dust off most of the dirt without washing. Howe (2006) cautions against using a cleaning brush, but says that commercial washers used for washing ginseng can be used if dealing with large quantities. After the roots have been washed, the material can either be sold to a buyer in its raw form or further processed by the harvester/landowner. Further processing (i.e., cutting and drying) should take place fairly soon (maximum one to two days) after harvesting, as the cut parts begin to turn white and lose their berberine content if they are not dried.

Material should be cut prior to drying as the roots can become very hard and difficult to cut after drying. The exception would be if using a commercial cutting machine, which is able to cut through the hard, dried roots (Howe 2006). Depending on the final market, the roots can be cut using a chipper or into segments according to buyer specifications.

After the roots and rhizomes have been washed and cut, they should be spread on racks to dry. Drying temperatures should be kept between 95°F and 105 °F, with good airflow. To prevent mold growth, indoor drying in a heated room with a fan or a commercial drying oven is recommended over outdoor drying or drying without heat, but this will depend in part on your local conditions. Drying time will depend on the size and thickness of the root material as well as the temperature and humidity. Drying time can range from 24 hours for chipped material to up to a week for intact roots. Roots can be tested for



Washing Oregon grape root with a hose to remove dirt and moss.



Drying racks with an overhead fan help quickly dry washed, chipped roots.

doneness when they break cleanly but maintain their structure (Howe 2006). Many herbal processors have specific requirements for drying, such as a maximum moisture content (e.g., 10%) for dried Oregon grape. Again, it is important to check with what the buyer wants in advance of the sale.

### Grading Quality

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Although no standard grading system exists for Oregon grape, buyers generally have certain criteria for assessing the quality of Oregon grape. In general, high quality Oregon grape root in its raw form is characterized by its cleanliness, yellow appearance, and undamaged root bark. Documentation of sustainable harvesting methods and land management practices of the harvested site (e.g., free of pesticide and herbicide use and other toxic substances) may also gain a market advantage. Above all, quality should be based on the specifications of the buyer.

Organic Wild Crop certification may also provide a market advantage, depending on the buyer. The USDA sets the standards for organic certification in the US, and includes a certification for wild crops. To qualify for Organic Wild Crop Certification, the landowner must provide evidence of sustainable harvest of the crop in an area that has been free of prohibited materials (e.g., pesticides/herbicides) at least 3 years. There are over 50 domestic certifying agents in the US including Oregon Tilth ([www.tilth.org](http://www.tilth.org)) and California Certified Organic Farmers (CCOF) ([www.ccof.org](http://www.ccof.org)). For a complete listing of certifying agencies go to the USDA National Organic program website<sup>19</sup>. For products exported overseas, the landowner should verify that the certifying entity meets the standards of international organic certification agencies, such as JAS (in Japan), EC (in the European Union) and CAN/CGSB (in Canada).

The decision by the small woodland owner to pursue Organic Wild Crop certification will depend on many factors, including the cost of certification<sup>20</sup> and expected additional revenues, as well as the decision to manage the land without the use of chemical herbicides and other prohibited materials. Many buyers are willing to pay a 50 to 70% premium for certified organic Oregon grape. Once a property is certified, all products derived from the land (including other medicinal and edible plants) can be marketed as certified organic. It is important to check with the buyer or processor that you want to work with to see if they will pay more for organic certification.

### Packaging and Storage

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<sup>19</sup> <http://www.ams.usda.gov/>

<sup>20</sup> As of 2010, the initial first year cost of Organic Wild certification by Oregon Tilth is \$624 (if located in Oregon), and an annual fee thereafter starting at \$469 (and increasing depending on revenues amounts from the sale of the organic product(s) from the previous year). More information on the fee structure and certification requirements can be found at <http://tilth.org/files/certification/OTCOProgramBundle.pdf>. <http://www.ams.usda.gov/>



Packaging and storage of Oregon grape root should always be done to the specification provided by the buyer. If Oregon grape is sold in its raw, undried form, a buyer will normally request that the plant be clean (i.e., washed to remove dirt), with roots and stems bundled with twine. Always check with the buyer to see how much aboveground stem material is allowed. Buyers will often allow some aboveground stems if they show a yellow color (i.e., berberine) and have a minimum diameter (e.g, thickness of a pencil). New stems and leaves are generally not permitted. The root should generally be kept uncut until further processing to avoid the white coloration that shows up on cut parts. A buyer will generally want to receive undried material one to two days at the most from the time of harvest.

Generally, dried Oregon grape root in bulk form is cut, using either a chipper or cut into 6-inch stems. Again, one should always check with the buyer about specific cuts that are acceptable. Buyers generally want to have the dried materials put into clean plastic polyethylene (or “poly”) bags that are food or pharmaceutical grade. Bagged material should be kept under 50 pounds, as recommended by the US Occupational Safety and Health Administration (OSHA) to prevent injury. A typical bagged weight is 44 lbs.

Material should be stored in a dry, cool site free of sunlight and pests. The storage facility should be kept clean, free of pests and domestic animals (cats, dogs) and at a constant room temperature to prevent dampness and mold growth. Dried Oregon grape root can be stored for up to two years in a cool, dry storage facility away from sunlight.

Often a buyer will request that each harvest batch be properly labeled with the name of the plant, quantity, batch code, and harvest date. Include in the labeling any problems encountered at any stage of productions (for example, pest infestation in the storage building, loss of power and heat during drying, etc.).

Any further processing, packaging, and labeling will depend on the target market. If you are selling your product to a commercial buyer, packaging should be done to the specifications of the buyer. If you are selling directly to the consumer, then further processing will generally be necessary. Extractions made from Oregon grape root include tinctures, fluid extracts, capsules, infusions, and decoctions (Howe 2006). See Appendix B on value-added products derived from Oregon grape.

## Sales

The small woodland owner may seek to enter sales agreements with their buyers, though most small sales have only a transaction receipt. A sales agreement is a document written prior to the transaction that details the product being sold and how it is being paid for. A sales agreement is not necessary for small transactions, but large, long-distance, international or recurring sales should have one for the protection of both parties.

**Terms and Conditions of Sale.** The sales agreement should detail the terms and conditions of the sale that must be met to satisfy each party. These include unit of measure (pounds, flats or other), price per unit, payment terms, how to grade quality, delivery timing, mode of transportation, transportation charges or fees and any other conditions.

**Payment terms** should be arranged in advance, and the small woodland owner should only extend credit if they are confident of the buyer's ability to pay. Payment terms include the currency of payment (for international transactions), acceptable payment form (credit card, cash, money order, personal check, etc) and payment due date.

For a fee, the USDA Agriculture Marketing Service can provide pre- and post-shipment inspections. According to the *Schedule of Fresh Products Branch Programs User Fees*, fees as of October 1, 2008 (Appendix E) ranged from \$69 to \$151 per batch of 50 or 51 packages, plus inspector hourly rates and mileage.

In addition to tax purposes, the small woodland owner should keep a record of all Oregon grape transactions for legal purposes. University extension offices or local US Forest Service should be aware of applicable laws pertaining to the sale of Oregon grape; while the federal and state departments of revenue should know any income tax rules. Small woodland owners should also check with the local chamber of commerce.

#### Record Keeping

The AHPA and AHP (2006) recommend keeping and maintaining collection records for all wild or cultivated crops destined for the medicinal/herbal market. Processors are now required to retain product samples of all plant materials used in processed dietary supplements (i.e., herbal medicinal products), with the seller's name, date of harvest, lot number and other pertinent information. Record-keeping guidance from AHPA and AHP at the time of this publication are listed in Appendix C.

### Target Markets

Marketing of Oregon grape, like any product, can be accomplished in a number of ways, depending on the amount of post-harvest processing that is done.

The small woodland owner will benefit from customer relationship management -- developing relationships with buyers that lead to equitable pricing and repeat business. While this kind of business relationship can take some time to establish, in the long run it can be quite profitable.

The small woodland owner should identify their target market(s), as this will help them determine the best way to reach potential buyers with marketing efforts and to understand the costs associated with serving them. A customer in Japan may be more expensive to reach, but the right message might make that sale more profitable than sales to a consolidator. Who the small woodland owner chooses to target is also largely a function of the time available for business activities and knowledge of specific markets.

#### Consolidation Buyers

These buyers consolidate purchases from numerous producers to fill large orders from corporate buyers. This is the simplest of arrangements. These companies may buy raw Oregon grape and do their own drying, cutting and packaging or buy material that is already dried and packaged. The buyer sets commodity pricing and the small woodland owner brings in the goods. Consolidators purchase from many harvesters to fill large orders that individual harvesters are not capable of filling alone. Some consolidators are cooperatives, owned and managed by the members and some are simply for-profit enterprises. While prices are not as

high and the small woodland owner has no ability to influence that price, the revenue is more predictable, there no expenses associated with marketing and less overall time is involved.

#### Processors

Processors are similar to consolidation buyers in that they purchase from multiple harvesters in both raw and dried forms. Product is purchased for value-added processes like medicinal tinctures, capsules, powders, teas, etc. They may be more difficult to find, however, and often have an established set of suppliers. They may also be interested in only purchasing large quantities of product and may require a guarantee of steady supply.

#### International Sales

The international market for Oregon grape root as a substitute for goldenseal may present a large market opportunity, as export sales of goldenseal are restricted due to the herb being listed as threatened by the Convention on International Trade in Endangered Species (enforced in the U.S. by the US Fish and Wildlife Service). In addition to the language, cultural, currency exchange and time differences, each international market operates under its own import and produce regulations. Even the smallest shipments of produce are usually subject to rules intended to prevent the spread of disease and pests. Also, in the case of medicinal products the more processed the product you are selling (e.g., bottles of Oregon grape in capsule form for the botanical supplement market) the more stringent the requirements and more regulatory agencies that are likely to be involved. As a producer the more you can document the sustainable harvest techniques and quality control in handling the easier it will be to navigate potential hurdles you encounter in trying to export your product out of the country. Although this may be time consuming, have this documentation will protect you if something goes wrong, and will help safeguard the end-user and the overall integrity of product's market. If a serious illness was ever linked to your product you would want to be able to demonstrate that you followed accepted practices and were not intentionally negligent.

State trade agencies like the Oregon State Department of Agriculture Agricultural Development and Marketing Division will often work with producers to help make marketing connections, provide marketing grants, help display products at trade shows, and provide other types of assistance to small woodland owners interested in marketing Oregon grape domestically and internationally. Similar programs may exist in other states. Nationally, the USDA Agricultural Marketing Service also provides assistance with international exports, though quite often their programs are managed through local federal or state offices.



Samples of Oregon grape root kept on file at a processing plant.

## Distribution

Oregon grape root can be transported in a number of ways, depending on the form, volume and distance. The seller should become familiar with all available modes of transport, as any number of events could make one or more either unavailable or cost-prohibitive. Any of these modes can be found with a search online or in the phone book.

The landowner should also familiarize him/herself with any state and local regulations or permits that may be needed to transport Oregon grape and other nontimber forest products. For example, in the state of Oregon, a permission slip (or permit to transport) is required to transport any forest product out of the forest. This permit can be a handwritten piece of paper from the property owner that includes the name and contact information of the person transporting the material, and the name of the property owner if different from the transporter.<sup>21</sup>

**Ground (Motor Vehicle)** – Harvesters and landowners delivering in small volume may find it most economical to deliver product using their own vehicle and deducting the mileage as a business expense or shipping via a ground service such as FedEx, Common Carrier or UPS.

**Passenger Ground Transport** – Amtrak passenger rail and Greyhound bus lines are examples of passenger ground transportation services that also carry small shipments. Though Amtrak does not ship perishable goods, other goods may be shipped through “Amtrak Express Shipping.”<sup>22</sup> Greyhound’s service is called “Package Express” and online quotes are available. For other services, contact the local train or bus station for details on shipping rules, restrictions and costs.

**Railway** – A number of freight rail options exist in the Pacific Northwest and this may be a good shipping option for transport from rural areas to urban customers. Shipments can vary in size from a single pallet to a full container load if coordinated through a shipping consolidator. The small woodland owner will still need to plan for transport from their facility to the station and from the destination station to the customer. Each carrier varies in the types of freight they will carry.

**Commercial Airlines** – This mode is fastest form of transport to distant markets. Many carriers post their rates online, with US Airways charging from \$0.30 to \$0.56 per pound for minimum size food shipments, depending on distance and shipping class (US Airways). As with rail shipments, transport must be arranged to the departing airport and from the destination airport to the customer. Since dried Oregon grape root is not quickly perishable, air transport may not be necessary or cost effective unless it is for international sales.

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<sup>21</sup> More information about this permit is available at <https://www.oregonlaws.org/ors/164.813> (accessed 2/8/11).

<sup>22</sup> Emails from Amtrak customer service. April 17, 2010 and April 20, 2010.

**Maritime** – Shipping over water is unlikely to be the most cost-effective method for domestic sales, though it may be a good option for international sales. Consolidators will sell container space per square foot, or per 20' or 40' container.

For those seeking to export Oregon grape root or other agricultural products, the USDA AMS publishes the *Agricultural Export Transportation Handbook* (Welby and McGregor, 2004), which provides useful information on numerous considerations that are specific to international sales.

## Promotion

There are many ways to sell your product, depending on how often you want to make a sale, your long-term goals, and the amount of time and effort you want to invest. Landowners and harvesters can build their personal brand as an individual harvester, emphasizing the quality and timeliness of deliveries, through networking or word of mouth.

**Personal selling** will be a key promotion vehicle for marketing Oregon grape to consolidation buyers and processors. Nothing can substitute for making face-to-face connections with a potential buyer. Establishing a trusting relationship with a buyer can ensure a long-term business relationships. The small woodland owner should identify talking points and practice their sales technique prior to reaching out.

**Word of Mouth** advertising is personal selling done for you by new or loyal customers. Keeping customers happy with good product and service is a marketing strategy in its own right.

**Classifieds** are a proven way to move product. Harvesters have had success both in local newspapers, such as the Nickel Ads, and on websites, such as Craigslist ([www.craigslist.org](http://www.craigslist.org)), eBay ([www.ebay.com](http://www.ebay.com)) and Etsy ([www.etsy.com](http://www.etsy.com)). There is little expertise required to promote in this way, and it is a low-cost option.



**Business Directories** can also be a valuable means of selling your product. For example, one free business directory that markets a variety of forest products is the Oregon Forest Industry Directory ([www.orforestdirectory.com](http://www.orforestdirectory.com)). Herbnnet ([www.herbnnet.com](http://www.herbnnet.com)), which features Herbal Green Pages Online, focuses on the herbal industry. You may also find regionally specific online databases like Foodhub in Portland which links buyers and sellers.

**Trade Shows and Events** can help develop network connections, particularly if you are interested in working in large volumes and/or becoming a consolidator or value-added processor. An examples of an herbal medicinal trade show is the Natural Products Expo West trade show (<http://www.expowest.com/ew12/public/enter.aspx>). Promotional materials should be brought, in addition to having product available to sample and buy. A booth at this venue type may be expensive so it may be a better forum for selling value-added products unless the small woodland owner has a large unprocessed inventory. A state agency like the Oregon Department of Agriculture may have a mailing list or newsletter you can sign up for to



get notifications about upcoming opportunities and events.<sup>23</sup> They also provide connections to resources that can help pay for event fees, reducing the cost of attending.

## Pricing

Specific prices are provided below – without guarantee of accuracy – to assist the business plan developer in identifying all relevant and possible costs and revenues associated with a for-profit enterprise around Oregon grape harvest for the medicinal market. Individuals should conduct their own pricing research, particularly for the purposes of forecasting.

### What Affects Pricing?

A number of factors affect the price that a small woodland owner can command. Working with a buyer in advance will help to identify some of these variables so they can be planned for.

- Reliability is important for most buyers, such as processors. This target market often is willing to pay a premium price for deliveries that come at the expected time in the predetermined condition.
- Cleanliness of delivered product is generally very important for medicinal herbs, since these will eventually be taken internally or applied externally by the end-user. Although most processors have highly sophisticated methods of cleaning and sanitizing products, most want products free of leaves, dirt, moss and other debris.
- Fresh Oregon grape root weighs 40-60% more than dried, thus prices for fresh are lower than dried. Keep in mind that product generally begins losing moisture through evaporation as soon as it is harvested so you may need to weigh product at various stages of your process to maintain accurate figures.

### Historical Pricing through Existing Channels

Part of the business planning process is to do research that will identify historical pricing of the product. Commodity markets exist for common raw materials like oil, wheat and metals. Oregon grape does not trade at such high volumes as these materials, and so there is no common market for the small woodland owner to reference in this planning process.

Information about Oregon grape pricing can often be found at sources listed in the table below. Buyers may be willing to share historical data for the chance at building up additional local supply. In some areas there will be no source of Oregon grape pricing and in these cases the small woodland owner may look to **substitute products** for pricing guidance. A substitute product is one that has the same form and function as the product being discussed. Goldenseal is often a substitute product for Oregon grape; though goldenseal may demand a higher price because it is more known worldwide and has limited availability.

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<sup>23</sup> <http://listsmart.osl.state.or.us/mailman/listinfo/agmarketing> Oregon Department of Agriculture Development and Marketing Division; 1207 Naito Parkway, Ste 104; Portland, OR 97209

Sample Oregon grape Product Prices 2011		
Form	Price/unit	Source
Raw root/stem	\$0.70/lb.	Local buyer
Dried root/stem	\$2.50/lb.	Consolidation buyer
Dried root after consolidation	\$4 to \$5/lb.	Processor
Powdered root, bulk retail	\$9.75/lb.	Urban natural food store
Quartered root, bulk retail	\$9.50/lb.	Urban natural food store
Liquid Extract	\$11.20/oz	Retail Website

## Industry Support

### Cooperatives

For small woodland owners seeking access to larger markets and customers but lacking in business expertise or substantial volumes demanded by large buyers, cooperatives are an attractive option. Cooperatives are organizations formed by their members – in this case small woodland owners – who pool their resources, equipment and skills. This collaboration allows individuals to contribute what they have, from marketing expertise to sorting equipment or cold-storage and to benefit from shared resources. Usually these cooperatives achieve non-profit or corporation status for tax benefits and other legal protections that they would not otherwise have.

Oregon Woodland Cooperative (OWC) is one example of such an arrangement, with 50+ member properties totaling over 20,000 acres. OWC is helping their members with many phases of nontimber forest product management and production. Their website, <http://www.orwoodlandco-op.com/>, provides numerous examples of members benefiting from the organization of sales for firewood and boughs, grant support and industry events.



### Government and Non-Governmental Organizations

University Extension Offices, the US Department of Agriculture and individual State Agriculture Offices all have departments dedicated to the support of emerging entrepreneurs. These

offices provide research, product development support, marketing support and business development services for the agriculture sector and are enthusiastic in their services. The small woodland owner is highly encouraged to engage their services at each stage of participation in non-timber forest product markets.

Online communities also facilitate connections between buyers, sellers and service providers. The NTFP Information exchange ([www.ifcae.org/ntfp](http://www.ifcae.org/ntfp)), maintained by the Institute for Culture and Ecology, is one example.

### Trade Associations

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As mentioned earlier in this report, the American Herbal Products Association (AHPA) (<http://www.ahpa.org>) is the national trade association and main advocacy group for the herbal products industry in the U.S. It provides the most up-to-date information on federal, state and international policies and regulations, and technical guidelines on product quality. AHPA also plays an active role in setting quality control standards, influencing policy, and advocating and lobbying for the herbal products industry.

The Herb Growing and Marketing Network ([www.herbworld.com](http://www.herbworld.com)) is a trade association for the herb industry. Members receive access to industry resource guides, an on-line business directory (Herbal Green Pages Online), business start-up assistance, and web hosting and design.

Many small forestland owners belong to an association such as the Oregon Small Woodlands Association. Such associations may perform a range of services such as lobbying government for political benefits, providing insurance opportunities, providing information publications and networking members to various skills and services. Often these associations are key resources for learning about and fostering trade opportunities. Medicinal plants such as Oregon grape and nontimber forest products in general have not typically been strong areas of expertise and promotion, but it is worth checking with your association and letting them know about your interests so they can devote more resources to helping you.

## S.W.O.T. Analysis

S.W.O.T. is an acronym representing the four parts of an analysis that reviews the **S**trengths, **W**eaknesses, **O**pportunities and **T**hreats of a given business. A SWOT analysis is a common feature in a business plan that shows a potential funder that the applicant has balanced of risks and rewards and considered how threats can be mitigated to take advantage of opportunities.

Ultimately each individual's SWOT will look a little different but we have provided one here as a basic example of some strengths and weaknesses of Oregon grape as a product and how those might be affected by the opportunities and threats posed by the herbal medicine marketplace.

### Strengths of Oregon grape

- The plant and its parts have many values and markets beyond medicinals, including transplants and native seed for landscaping and restoration, a floral green for the decorative industry and food.
- Can be managed alongside other commercially and ecologically valuable forest species and can potentially be sustainably extracted from areas receiving conservation credits.
- Good after-fire crop, as it is a species that can thrive without overstory
- Doesn't require pesticides or herbicides
- Hardy plant that is drought and frost tolerant
- Has abundant wild populations in many parts of the Pacific Northwest forests and can also be cultivated.
- Can be co-managed in systems where tree production is the priority
- Plant spreads through rhizomes and so does not require reseeded if harvested correctly

#### Weaknesses of Oregon grape

- Vulnerable to damage from some types of timber operations
- No readily or publicly available history of supply or demand
- The majority of the plant is typically removed when harvesting for Oregon grape for the medicinal market and regeneration from remaining root or replanting will take a few years. This can impede consistent supply if you do not have the ability to harvest in rotation.
- *Mahonia aquafolium* is most desirable for medicinal purposes, due to its bright yellow color. Other species that have the same medicinal qualities but less of the yellow pigment are perceived by some buyers as less valuable.
- Thick overstory from an aging tree stand can reduce production of Oregon grape

#### Opportunities in the Marketplace

- Plenty of opportunity exists to develop new products and reach new customers
- A strong consumer market exists for local, natural products harvested sustainably and marketed ethically (e.g., fair trade).
- International markets present opportunities for growth as an alternative to wild goldenseal.
- Some buyers have indicated a willingness to pay a 100% premium for certified wild crop organic Oregon grape root had difficulty in finding suppliers.
- The demand for botanical products is regaining strength after declining from record highs in the 1990s.
- Public lands have in the past been cheap sources for raw nontimber forest products, but public forest agencies have greatly restricted access to Oregon grape and other products on the lands they oversee, primarily because of a lack of funding to manage a sales program as the law requires. This increases the market for products from private woodlands.
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#### Threats in the Marketplace

- If demand for Oregon grape stagnates or declines it may lead to oversupply and declining prices.
- The market for Oregon grape is growing but may or may not ever be huge like for the market for ginseng, another wild and cultivated forest medicinal. Thus it may not be profitable enough for a producer to focus exclusively on Oregon grape.

- Fluctuating exchange rates in international sales. The seller should be careful in wording of contracts to prevent committing to a pricing structure that is vulnerable to exchange rate fluctuations. For example, if a contract is written in Euros for a customer in France, that sale could be more or less profitable than intended depending on exchange rates at the time the Euros are converted to US dollars.

## Barriers to Entry

- If no plants exist on the land, transplanting or seeding Oregon grape may be cost-prohibitive and will take at least a few years before being harvestable.
- The cost of labor may exceed the value of the product collected.
- The speed at which plants grow and regenerate after harvest could be a problem if the forest owner lacks enough habitat and supply to meet buyer minimums.
- As sources of supply increase so will competition for a limited number of Oregon grape buyers, increasing the buyers leverage for negotiating lower prices.
- Harvesters must be able to physically do the work and transport the plants. Many small forestland owners are older and may not be interested or capable of doing the manual labor that accompanies most Oregon grape harvesting.

## Cost Analysis

A thorough analysis of expected costs will be required for any business plan that will represent a significant source of expenses or income for the small woodland owner, particularly if bank financing is sought. Each potential cost category is listed here with details, but the small woodland owner should conduct research to determine actual pricing. See Appendix F for a sample cost worksheet.

*Labor* – Oregon grape is a labor-intensive crop. The small woodland owner should calculate the number of annual hours needed per labor type (harvesting, sorting and processing, packaging) and the cost per hour of each laborer.

*Shipping* – Shipping costs will vary by sales type. Internet sales will have a higher shipping cost overall because of the smaller volumes, but those costs may be charged back to the customer. If a shipping company is used that does not provide the shipping containers, those should be factored in as well.

*Packaging* – Unless you are selling fresh product to a consolidator in bundles, dried and cut Oregon grape will need to be packaged for shipping. Oftentimes a buyer prefers the dried root to be chipped into small pieces. The small woodland owner should consider how many pounds will be harvested per year and how they will be processed, to determine the annual packaging costs. Clean food or pharmaceutical grade polyethylene (or “poly”) bags are the standard for dried and cut Oregon grape root.

*Drying* – While the drying process can be done outdoors in dry weather, harvest typically takes place during the wet seasons and so will need to be done indoors. The cost of a dehumidifier or heater and a fan should be considered.



*Equipment* – How much equipment will be required depends in large part on how much processing will be done prior to sale. At a minimum, pruning shears, work gloves, a shovel, tarp and twine will be needed to harvest Oregon grape, as well as a car, truck or cargo van for transporting the harvest. A computer with Internet is recommended. It is much easier to find buyers and manage shipping, among other business tasks, if it can be done in the privacy of a home or office. The local library often has computers for public use, if needed.

*Supplies* – Supplies are items purchased for use that will have to be replaced completely. These include pens, paper, stamps, envelopes, storage bags, chipper blades, etc.

### Key success factors

- Having a plan.
- Keeping good records. Having sales receipts that document business income, and the expenses incurred to earn that income, will make tax time much easier. Keeping good records also means creating documents, such as purchasing agreements, to ensure prompt payment by customers. Small woodland owners who hire employees must also plan for filing human resources related paperwork and for tracking wages paid.
- Understanding the customer. What is done to the product affects who will want to buy it and why.
- Understanding applicable laws. Laws govern all areas of business including health and safety of employees, harvesting and transport of special forest goods, food safety and income.
- Knowing the business's revenue needs and planning to meet them.
- Knowing the time and resources required for the value chain and being prepared with these prior to the first harvest.

## Appendix A: Other Oregon Grape Plant Products

Oregon grape can be used as an ingredient or input for any number of consumer products. From traditional food products, like jams and muffins, to personal care products like soap, uses for Oregon grape are limited only by the imagination. Making added-value products takes more time, resources and skill than selling unprocessed Oregon grape, but can also be more profitable if the products are well made and marketed.

The U.S. Food and Drug Administration has specific labeling requirements for most processed foods and nutritional supplements, including Oregon grape in processed form. The processor should seek assistance in complying with all state and federal regulations for food and nutritional supplements. Most consumer products are governed by some oversight agency, so regulations should be well understood prior to starting business.

### *Berries of the Oregon grape plant*

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The berries of Oregon grape are generally too tart in flavor to be eaten fresh, but can be made into jam, syrup and baked goods. They can also be mixed with sweeter berries (such as huckleberries or blueberries) in processed form.

Oregon grape berries ripen in mid summer (July) and are present on the plant until the fall (October). The berries are blue in color and become round and plump upon ripening. The berries can be easily picked, either by hand or by placing a container under a bunch and shaking the branch. They can also be harvested with a special berry harvesting rake that has a comb-like attachment on one side connected to a small bucket.

Picked berries should be refrigerated or kept in a cooler (around 5 C or 41 F) after being picked. Berries should not be washed, as this will decrease their storage life. Fresh berries should be placed in shallow containers or baskets to avoid crushing. They should be taken to a buyer within 1 to 2 days after picking unless frozen or dried. It is recommended that berries used for making canned preserves be frozen first to help break down the outer skin of the berry.

More information on marketing wild berries can be found in the Huckleberry Market Analysis of this series, available at: [www.ifcae.org/ntfp/](http://www.ifcae.org/ntfp/)

### *Oregon grape transplants and native seed*

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Although little research has been done on the market for Oregon grape transplants and native seeds, the potential market for these products could be huge. The cultivated nursery industry is Oregon's largest sector of agriculture. Oregon grape is one of the largest selling native products. Examples exist of landowners transplanting native plants from their forest into pots and marketing them to nurseries or directly to consumers at farmer's markets. This could easily be done with Oregon grape.

The native seed industry is a growing industry, particularly for restoration project, and there is a large demand for plants that come from local genetic stock. The Native Seed Network is one useful resource for finding native seed vendors and buyers (<http://www.nativeseednetwork.org/>).

### Floral Greens

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The leaves of Oregon grape can also be used for floral greenery. Although used year-round, they are particularly popular in the fall and winter. In the fall, Oregon grape leaves, especially those exposed to direct sun, will turn a reddish-orange color, making them an attractive plant for fall floral arrangements. Its holly-shaped, evergreen leaves are also used for Christmas wreaths and other winter holiday decorations. As with all products intended for sale, check with potential buyers (e.g., florists) first to see they are interested in buying your product and the current prices they are paying.

Harvesting Oregon grape for floral markets can be done throughout the year, although leaves should not be harvested during growing season (early to late spring) as this can damage the plant. The ideal length to cut stems (i.e., compound leaves)<sup>24</sup> ranges from 12 to 15 inches. Harvested stems are commonly tied together in bunches. Cocksedge and Schroeder (2006) recommend bunching stems into clusters of 26. Again, check with the specifications of the buyer. To insure a sustainable harvest, Cocksedge and Schroeder (2006) recommend harvesting no more than 30% of leaves from a given site, and avoiding harvesting all leaves from a single plant or area.

Once stems are harvested, they should be kept moist and cool (but not wet) at about 41 F (5 C), particularly in the summer months (Cocksedge and Schroeder 2006). Refrigerated coolers are ideal, but a cool shed or carport is also acceptable in the winter months. When the weather warms up, stems should be placed in a cool environment within 24 hours after harvesting to prevent them from drying out.

Cocksedge and Schroeder (2006) reported that average price in 2006 was \$0.40 per bunch for Oregon grape. Prices may vary over time and season, so talk with your buyer about current prices.

### Processed Medicinal Oregon grape root

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Processed medicinal products derived from Oregon grape root include tinctures, powders, teas, decoctions, oil infusions and skin ointments and creams. Processing Oregon grape root can begin with the raw, cleaned plant or dried and cut plant. In both cases, additional cleaning, sorting and cutting is often



<sup>24</sup> Oregon grape forms compound leaves, made up of a number of smaller holly-like leaflets. The main stem of the leaf may actually look like a stem.

required, depending on the end-product. It is beyond the scope of this report to cover details of Oregon grape root processing, and readers are encouraged to seek other sources. One useful resource that identifies Oregon grape species and provides simple recipes for homemade tinctures and teas is Medicinal Plants of the Pacific West, by Michael Moore (1993). Other resources that provide greater detail for commercial processors include Phytopharmaceutical Technology by List and Schmidt (1989) and Herbal Drugs and Phytopharmaceuticals, by Wichtl (2002).

**FDA Regulations** In addition to understanding the details of value-added processing of raw Oregon grape the landowner must also comply with the labeling, processing, and marketing requirements of the U.S. Food and Drug Administration. Processed Oregon grape root and other wild herbs and botanicals used for medicinal purposes (sometimes referred to as “phytopharmaceuticals”) are considered dietary supplements by the U.S. Food and Drug Administration (FDA). FDA regulates dietary supplements under a different set of regulations than those covering “conventional” foods and drug products (prescription and over-the-counter). Generally, manufacturers do not need to register their products with FDA nor get FDA approval before producing or selling dietary supplements.

Despite not needing FDA approval prior to marketing, all manufacturers, processors and packagers of end-use herbal products must be registered with the FDA prior to producing or selling supplements and must comply with current Good Manufacturing Practices for Dietary Supplements<sup>25</sup> that ensure the identity, purity, quality, strength and composition of the dietary supplement.

As of 2007, the FDA requires that manufacturers of dietary supplements conduct 100 percent identity testing, which means every product included in a dietary supplement must be tested to verify its identity prior to processing. One common method of product verification is in a laboratory using thin layer chromatography. The FDA has also allowed companies to petition for an exemption to this rule if they can provide data showing that less than 100% identity testing will still assure 100% purity. The processor should seek assistance from the local county health department in complying with all local, state and federal food regulations.

The U.S. Food and Drug Administration also has specific labeling requirements for most processed foods, including dried Oregon grape berries (USDH&HS FDA Labeling 2009). Manufacturers must make sure that product label information is truthful and not misleading. (USDH&HS FDA Supplements 2009). Not only must certain products bear a Nutrition Facts label, but there are guidelines for the claims that can be made about the characteristics of a product, such as claims about medicinal value. The processor should seek assistance from the local county health department in complying with all local, state and federal food regulations.

**Marketing Processed Oregon Grape Root** Marketing processed Oregon grape to wholesale or retail customers will require additional marketing strategies, and may include specialty grocers and natural food stores, farmer’s markets and direct web sales.

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<sup>25</sup><http://www.fda.gov/Food/DietarySupplements/GuidanceComplianceRegulatoryInformation/RegulationsLaws/ucm079496.htm>

### Specialty and Natural Foods Stores

Store management in specialty grocers usually have the autonomy to make sourcing decisions and so are the best first contact to make. A primary concern to these grocers is keeping product in stock, so frequent and reliable delivery is paramount. Reaching the decision-maker and getting them to buy may be difficult and take a few visits. A small woodland owner who is confident and persistent will have better luck than one who makes just one phone call.

An excellent guide to marketing and selling special forest products to retailers can be found in the publication "Marketing Special Forest Products in New York State" (Ochterski et al. 2005). Though its title says New York state, the talking points, customer considerations, selling strategies, promotion ideas and other content are relevant for all markets nationally.



### Farmers' Market Shoppers

Open farmer markets provide a forum for directly educating consumers about Oregon grape root. Attending a farmer's market is, for most, an enjoyable outing. Customers are relaxed and open to learning about the sustainable nature of small woodland owner operations and the medicinal characteristics of the product.

Most farmer markets charge a table fee and that fee should be balanced against the expected sales volume per day. The small woodland owner can consider sharing a table with other harvesters to reduce costs, if necessary to maintain profitability.

The small woodland owner should have educational and informational materials to hand out to potential customers. The materials should have the owner's contact information and information about the products available, as well as anything else that may be of interest such as the history of the forest.

### Direct Web Sales

One of the most prolific marketplaces is the Internet. It is an opportunity to connect directly with the customer. The small woodland owner's website could be an opportunity to secure members for a Community Supported Forest Agriculture project or just a way to promote value-added products.

Online customers are savvy and may arrive at the small woodland owner's website highly educated about what products are available and how much they should cost. For this reason, the owner should research online prices to be sure their own prices are competitive. Community-based classified websites like Craigslist are a good place both to do pricing research and to sell product.

There are a number of places to get help creating a website. If you have limited experience with websites, you may do best asking a local extension office for help finding a professional. A small woodland owner with more Internet experience could use a free service from Google or Yahoo! or pay for one from any number of online providers.



## Appendix B: Community Supported Forest Agriculture

Community Supported Forest Agriculture (CFSA) enterprises are an opportunity to bundle Oregon grape with other nontimber forest products. In this model, customers purchase a share of the farm or forest and receive a monthly harvest. Customers buy it to support “lifestyle agriculture” and other benefits such as sustainability. The harvest may be just Oregon grape, or may include any variety of non-timber forest products available in the small forest, from truffles and mushrooms to boughs and floral greens. Products follow the seasons and connect the consumer to their local natural areas and their bounty. Often included is some form of newsletter that builds the customer’s relationship with the small woodland owner. Some CSA models include member harvesting days, though coordinating large group trips would require more planning than harvesting on a conventional farm.

## Appendix C: Record-Keeping Recommendations

The following list of recommendation comes from the “Good Agricultural and Collection Practice for Herbal Raw Materials” guide prepared by American Herbal Products Association and the American Herbal Pharmacopoeia (AHPA and AHP 2006).

### *For cultivated crops:*

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- (1) Identity and source of any propagation material. If the Oregon grape is being actively cultivated, list the name and location where the propagation material originated. The source of the plant could include be a nursery, seed company, naturally occurring on the property, etc.
- (2) List of all fertilizers, composts, herbicides, insecticides, fungicides or other applications made to the plant.
- (3) Information about the water source. This includes where the water originates (e.g., well, spring, creek), and any tests conducted on the water to insure potability.

### *For wild-harvested crops:*

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- (1) Permits or licenses required to harvest from a property, if not the owner.
- (2) Information about the harvest site. This includes a description of the site location, site history, vegetation associations, soil types or least conditions, proximity to roads and railways, and any other pertinent observations.

(3) Steps taken to insure proper identification of the plant. This could include a voucher specimen<sup>26</sup> or tracking information on where the specimen can be located.

(4) Proof of sustainable harvest practices. For wild-harvested plants, information should include any inventories or photo points collected, harvest practices, steps taken to promote regeneration/propagation.

(5) Quantity, date, and parts of plant collected. Each crop collected should be assigned a lot number or other ID code.

#### *For post-harvest handling:*

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(1) Name and location of all post-harvesting handling. This includes identifying each facility, and information on maintenance, cleaning and pest control procedures in each facility.

(2) Description of all equipment used. This should also include information on how the equipment is maintained.

(3) Washing and cleaning activities. This should include the water sources used in washing, and cleaning procedures used.

(4) Description of all post-harvesting activities, including any species preparations (bark removal, cooking, fermenting).

(5) Drying. This includes drying equipment used, temperatures, times, beginning and ending weights of crops, moisture content.

(6) Cutting and milling.

(7) Packaging. This should include enough information to be able to trace the material back to the point of origin.

(8) Shipping. This includes records of the chain of custody from the harvester to the final point of sale.

#### *For personnel:*

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(1) Maintain records of all persons involved in the operation. This includes employees, contractors, family members. Include training received, and steps to insure proper safety and hygiene.

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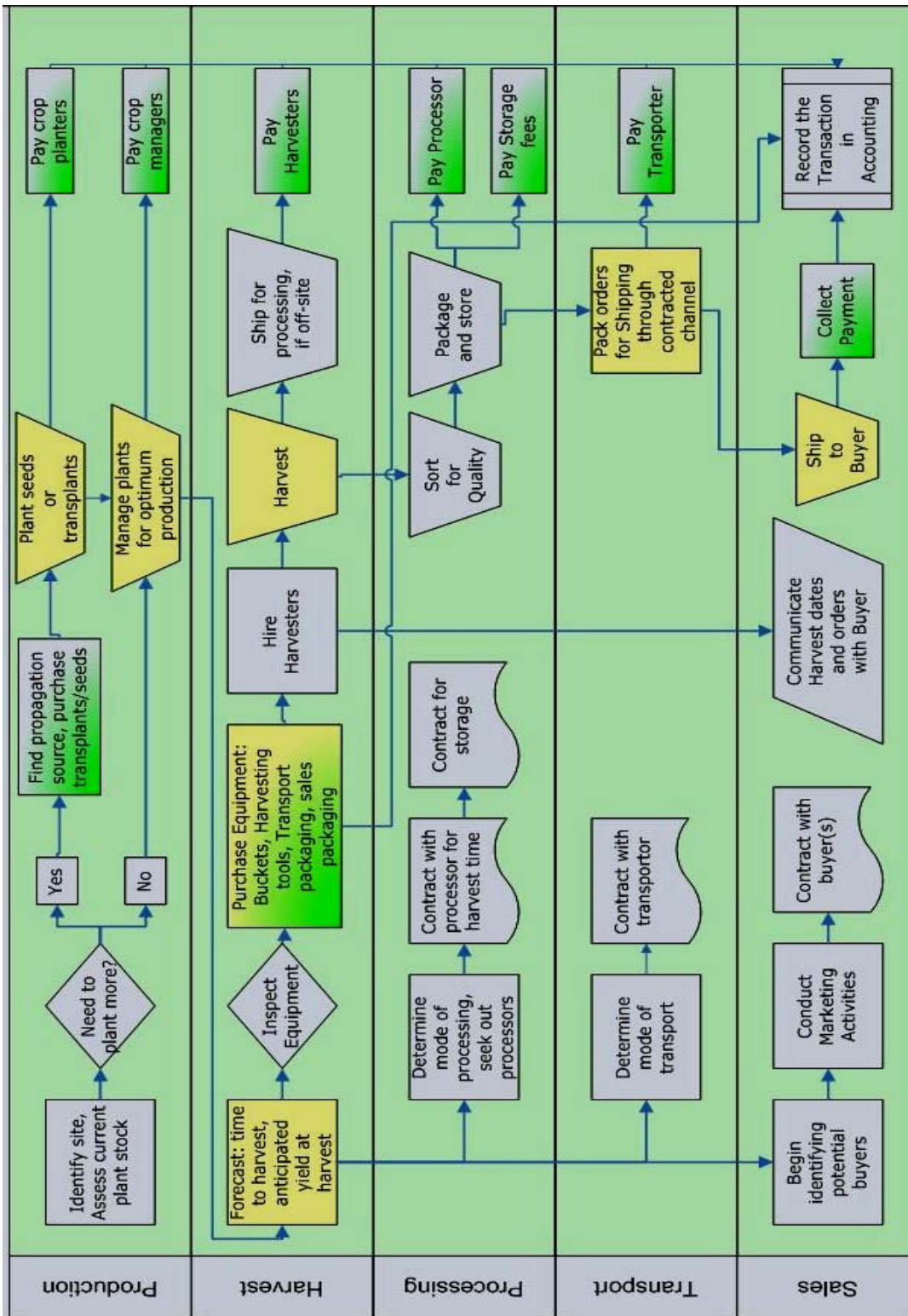
<sup>26</sup> Information on preparing a voucher specimen can be found in the appendix of Good Agricultural and Collection Practice for Herbal Raw Materials (2006) available at [http://www.ahpa.org/Portals/0/pdfs/06\\_1208\\_AHPA-AHP\\_GACP.pdf](http://www.ahpa.org/Portals/0/pdfs/06_1208_AHPA-AHP_GACP.pdf).

*Retention samples:*

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(1) Keep samples of each lot of material produced for a minimum of 3 years in case of any recall. Insure that the samples are properly labeled with the plant name, part of plant, the form of the material (whole, powder, etc.), contact information, location of harvest, date of harvest, and identifying number (e.g., lot number).

Appendix D: Oregon Grape Value Chain



## Appendix E: USDA Fresh Products Inspection Fees

Schedule of Fresh Products Branch Programs User Fees for Inspection Services By USDA Agriculture Marketing Service, 2009 (USDA AMS 2009)

Inspection Services*	Current Fee
<b>Quality and condition inspections of products each in quantities of 51 or more packages and unloaded from the same land or air conveyance:</b>	
• Over a half carlot equivalent of each product	\$151.00
• Half carlot equivalent or less of each product	\$125.00
• For each additional lot of the same product	\$69.00
<b>Condition only inspections of products each in quantities of 51 or more packages and unloaded from the same land or air conveyance:</b>	
• Over a half carlot equivalent of each product	\$125.00
• Half carlot equivalent or less of each product	\$115.00
• For each additional lot of the same product	\$69.00
<b>Quality and condition and condition only inspections of products each in quantities of 50 or less packages unloaded from the same land or air conveyance:</b>	
• For each product	\$69.00
• For each additional lot of any of the same product	\$69.00
<b>Rail car lots and/or lots not unloaded from a single conveyance in excess of carlot equivalents will be charged proportionally by the quarter carlot.</b>	
<b>Dock side inspections of an individual product unloaded directly from the same ship:</b>	
• For each package weighing less than 30 pounds	3.8 cents
• For each package weighing 30 or more pounds	5.9 cents
• Minimum charge per individual product	\$151.00
• Minimum charge for each additional lot of the same product	\$69.00
Hourly rate for inspections performed for other purposes during the grader's regularly scheduled work week - Hourly rate for non-carlot equivalent inspections such as count, size, temperature, container, etc. or work associated with inspections such as digital image services will be charged at a rate that reflects the cost of providing the service	\$74.00
Overtime rate (per hour additional) for all inspections performed outside the grader's regularly scheduled work week	\$38.00
Holiday hourly rate	\$74.00
Hourly rate for inspections performed under 40 hour contracts during the grader's regularly scheduled work week	\$74.00
Rate for billable mileage	\$1.32
<b>Audit Verification Services**</b>	
<b>Hourly rate for audit verification services</b>	<b>\$92.00</b>

\*Inspection Services Fee Increase- Effective March 1, 2008

\*\*Hourly rate for Audit services-Effective October 1, 2008



## Appendix F: Sample Cost Worksheet

This worksheet is for demonstration purposes only and should not be used for business planning purposes. The purpose is to provide the small forestland owner a starting place for thinking about the range of costs that can affect revenue. Most users will see places where they can reduce costs listed here. This sheet assumes 250 lbs harvested per day for 10 days in winter, which may or may not be realistic for your property or for the number of people involved in your operation. It assumes a vehicle already owned and a 50% weight loss when fresh root is dried.

<b>COST ANALYSIS</b>	<b>Unit</b>	<b>Price per</b>	<b>Qty</b>	<b>Year 1</b>	<b>Year 2+</b>
<b>Assumptions</b>					
	acres		25		
Pound per acre	lbs (fresh)			100	100
Pounds per year	lbs (fresh)			2,500	2,500
Pounds per year	lbs (dried)			1,250	1,250
<b>Production</b>					
Site Assessment	each	\$ 1,500	1	\$ 1,500	
<b>Harvest</b>					
Vehicle maintenance	each	\$ 600	1	\$ 600	\$ 600
Fuel – Harvest	gallon	\$ 4	40	\$ 160	\$ 160
Pruning shears	each	\$ 30	2	\$ 60	
Shovel or pulasky	each	\$ 35	2	\$ 70	
Leather gloves	each	\$ 15	3	\$ 45	
Collection bags or tarps	each	\$ 15	4	\$ 60	
<b>Processing equipment</b>					
Fan	each	\$ 30	4	\$ 120	
Drying rack/screen	each	\$ 20	8	\$ 160	
Heater	each	\$ 50	2	\$ 100	
Chipper	each	\$ 1,000	1	\$ 1,000	
Woven polypropylene bags	500	\$ 300	1	\$ 300	
Hanging scale	each	\$ 50	1	\$ 50	
Shipping scale	each	\$ 150	1	\$ 150	
<b>Sales</b>					
Shipping (hand delivery)	trip	\$ 50	10	\$ 500	\$ 500
Marketing (web, catalogue, classifieds)	total	\$ 250	1	\$ 250	\$ 250

(Continued on next page)

<b>Labor</b>					
Labor – Harvest	hours		80	\$ -	\$ -
Labor – Process, Package, Ship	hours		80	\$ -	\$ -
State Payroll taxes	percent	\$ 0		\$ -	\$ -
<b>Management</b>					
Internet, Phone	month	\$ 50	12	\$ 600	\$ 600
Insurance	month	\$ 30	12	\$ 360	\$ 360
Computer and printer	each	\$ 1,000	1	\$ 1,000	
Professional tax services	return	\$ 200	1	\$ 200	\$ 200
<b>Cost of Goods Sold (CGS)</b>					
Year 1 ( <i>includes start up costs</i> )	annual			\$ 7,285	
Years 2 and beyond	annual				\$ 2,670
<b>Revenue (sales)</b>					
Oregon grape (dried, cut)	pound	\$ 3	1,250	\$ 3,750	\$ 3,750
<b>Profit for Dried/Cut Oregon grape</b>					
Revenue <i>less</i> CGS	Year 1				\$ (3,535)
Revenue <i>less</i> CGS	Year 2+				\$ 1,080
Breakeven	(years)		3.3		

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