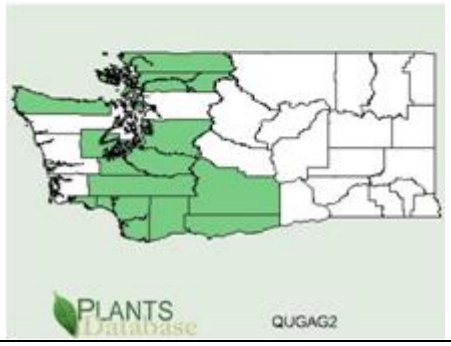
Plant Propagation Protocol for *Quercus garryana*
ESRM 412 – Native Plant Production Spring 2020
Protocol URL: http://courses.washington.edu/esrm412/protocols/QUGAG2.pdf

(From https://oregonstate.edu/trees/broadleaf_genera/species/oak_spp.htm)

TAXONOMY	
Plant Family	
Scientific Name	Fagaceae
Common Name	Beech
Species Scientific Name	
Scientific Name	*Quercus garryana*
Varieties	*garryana*
Sub-species	
Cultivar	
Common Synonym(s)	
Common Name(s)	Oregon white oak, Garry oak, Brewer's oak, Chêne de Garry
Species Code (as per USDA Plants database)	QUGA4
GENERAL INFORMATION	

Geographical range	 
Ecological distribution	Oregon white oak is native to western North America. It occurs from Vancouver Islan Columbia (49 °N latitude), to southern California (34 °N latitude). Oregon white oak primarily west of the Cascade Range but populations are scattered east of the Cascade The most widely distributed variety is *Q. g*. var. *garryana*, which occupies habitats fr Columbia south to possibly Los Angeles County. In the southernmost reaches, *Q. g*. v *garryana* is restricted to riparian sites. Oregon white oak habitat loss is reported throughout its range. A 1998 Pacific Northv Ecosystem Consortium indicated that Oregon white oak woodlands and savannahs in Willamette Valley of Oregon have declined to less than 15% of their pre-European se extent. In British Columbia, comparisons of early survey records and current occurren indicate that Oregon white oak habitat loss has exceeded 95%. Habitat loss is primaril of European settlers that suppressed fires, altered land use, and introduced nonnative s heavy grazing. In Oregon white oak's easternmost distributions, habitat protection and Oregon white conservation alternatives may be limited. Slightly more than 83% of Oregon white oa privately owned, and none is under permanent protection in southeastern Oregon and/ California.
Climate and elevation range	Oregon oak is best developed as a tree on Slopes, woodlands, mixed evergreen forest, conifer forests, and valleys at an elevation **1800** m. where annual rainfall exceeds **30** inches. The range in climate is considerable from the relatively cool, moist Fraser Valley of British Columbia to the summer-dry Coast Ranges north of San Francisco and the foothills of the Sierra Nevada in California. Oregon oak takes the form of a shrub on nutrientpoor soils (e.g., serpentine) and drier forming clonal thickets. It is tolerant of freezing conditions and also has a broad tolerance of substrates, which vary from rocky, thin soils of ridges

	to the deep loams and clays of valley bottoms.
Local habitat and abundance	Oregon Oak is often associated with local grasslands maintained by fire. In some area develop into multi-stemmed plants, which may live up to 10 years, until a single shoo dominant. Like most oaks, Oregon oak has an obligate relationship with mycorrhizal which provide additional moisture and nutrients. Common associates in mixed forests madrone, Douglas fir, tanbark oak, and yellow pines.
Plant strategy type / successional stage	Oregon Oak is a stress-tolerator, seral, and climax species, thriving in grasslands with fires. In areas where regular fires do not occur it will often be overtaken by Douglas F
Plant characteristics	*Quercus garryana* is a Pacific Northwest native deciduous tree. It grows up to 30 m ta throughout much of its range in the Pacific Northwest and has an open, rounded crown. However, in the southern part of its range, including interior California, it also is a shrub up to 5 m tall, which is treated as var. *breweri* Jepson. The mature bark is brow and shallowly fissured in a checker-like pattern. Leaves are oblong to obovate, 8-15 cm long, and deeply lobed (5-7 rounded lobes). The upper surfaces are shiny and dark green, but the lower surfaces are pale green. Like all oaks, Oregon oak is monoecious and wind-pollinated. The acorn cups are composed of thick, tubercled scales. The one-seeded nuts are 2-3 cm long, ovoid, and mature in one year. Flowering takes place from March to May. Fruits mature between August and November. Trees may live up to 500 years
PROPAGATION DETAILS	
Ecotype	
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container
Stock Type	
Time to Grow	There is a rapid development of the tap root initially, and shoot growth is slow but can increased by increasing the photoperiodsm.
Target Specifications	Well-established roots with some leafing. Shoot needs to be 6-10 inches tall before th longer require weeding.
Propagule Collection Instructions	Can easily be picked or shaken off a tree. Maturation of fruit usually occurs from late early November. Care should be taken to collect local fruits, because they may be ada local environmental conditions. Viable nuts may be green to brown, and have unblem walls. Nuts with discoloration or sticky exudates, and small holes caused by insect lar be discarded.
Propagule Processing/Propagule Characteristics	No processing is necessary as seeds are not dormant and should be planted quickly
Pre-Planting Propagule Treatments	Oak seeds do not store well and consequently seeds should be planted soon after matu are considered ripe when they separate freely from the acorn cap and fall from the tre necessary acorns can be stored under refrigeration for 3 months or more, but the likeli germination and mold growth increases over time. To store acorns, dry them, place

	them in plastic bags, and refrigerate. For longer storage, rinse acorns in a 5-percent bl solution first, and ensure that the refrigerator is set as close to 33 °F (1 °C) as possible
Growing Area Preparation / Annual Practices for Perennial Crops	Seeds may be planted in one-gallon containers, using well-drained potting soil that in slow-release fertilizer. Tapered plastic planting tubes, with a volume of 10 cubic inch also be used. Seeds should be planted 1-2 inches deep and the soil kept moist and aera Seedlings should be transplanted as soon as the first leaves open and become firm, wh generally occurs in spring.
Establishment Phase Details	They must be kept cool and moist until germination. Although germination usually oc spring, seeds will germinate soon after dispersal under warm, moist conditions; they a germinate prematurely in cool, moist storage. As with other Oregon white oaks, sowi the fall may be best. Limited tests indicate rates of viability that are greater than 75 pe Seeds remain viable for only one season.
Length of Establishment Phase	Seedlings rapidly develop a deep taproot, which may account for their ability to estab grass and in droughty soils. A taproot will begin to grow within a few weeks, and a sh appear in spring. The shoot of natural seedlings often remains small and shrubby for r perhaps to accommodate development of deep roots. Regeneration from seed is greatl when seeds are protected from rodents and other predators.
Active Growth Phase	The establishment phase is followed by a sapling stage with relatively rapid growth fo years.
Length of Active Growth Phase	Given suitable conditions the oak will continue to grow for up to 500 years.
Hardening Phase	
Length of Hardening Phase	
Harvesting, Storage and Shipping	Seedlings can be harvested and stored easily in nurseries as long as they do not becom bound." That is, as long as the taproot is circled around the base of the pot. Circled tap be very hard to straighten at planting time and usually must be pruned off.
Length of Storage	Seedlings can be grown in nurseries for several years without negatively impacting gr some projects it may be beneficial to select seedlings of a variety of ages for planting.
Guidelines for Outplanting / Performance on Typical Sites	Planting holes should be at least twice as wide and deep as the container. Seedlings m watering every 2-3 weeks during the first season. Care should be taken to weed and m around young plants until they are 6-10 inches tall. Natural regeneration, through spro seed germination, is promoted by fire, which contributes to expansion and persistence oak stands. Continued disturbance by fire may result in pure stands that are often asso an understory of grasses or scattered shrubs. Oregon oak is not as susceptible to oak c root rot fungi as other oaks, unless disturbed by changes that include irrigation. Activ disturb or compact soil around large trees, especially in urban settings, should be avoi
Other Comments	Growth of Oregon white oak is generally slow. Height growth is usually less than 1 ft and diameter growth is often 15 to 20 rings/in. Faster growth, particularly in diameter possible (3 to 10 rings/in.). Stump sprouts may grow as much as 3 ft per year during t years. Oregon white oak stands may achieve basal area of up to 265 ft2 per acre and v high as 4500 ft3 per acre.
PROPAGATION DETAILS	
Ecotype	

Propagation Goal	Plants
Propagation Method	Seed
Product Type	Direct Seeding
Stock Type	
Time to Grow	There is a rapid development of the tap root initially, and shoot growth is slow but ca increased by increasing the photoperiodsm.
Target Specifications	Well-established roots with some leafing. Shoot needs to be 6-10 inches tall before th longer require weeding.
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Growing Area Preparation / Annual Practices for Perennial Crops	Seeds may be planted at the beginning of the winter. Once the site is chosen, prepare are 10 inches in diameter and 4-5 inches deep. One gram of a slow-release fertilizer sh placed in the bottom and covered by a small amount of soil. Place 6-10 acorns in each depth of 1-2 inches. Rodents or birds should use temporary enclosures to minimize he simple enclosure can be constructed from a one-quart plastic dairy container with the removed and a metal screen attached. Towards the end of the first season, seedlings sh thinned to 2 or 3 per hole and to one seedling by the second season. Supplemental wa be necessary if a drought of 6 weeks or more occurs during the spring.
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