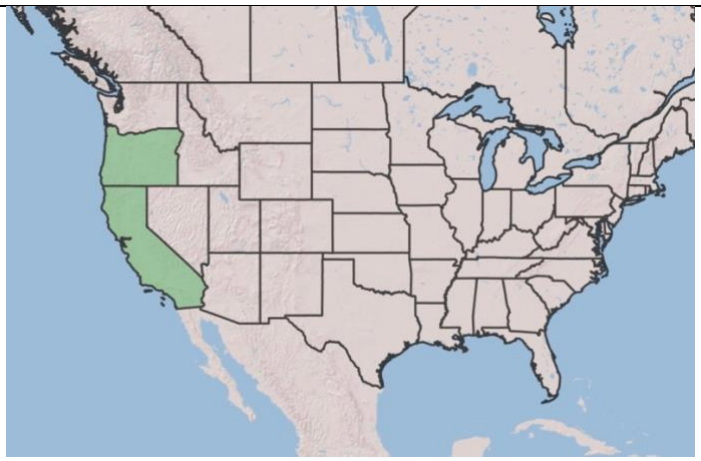
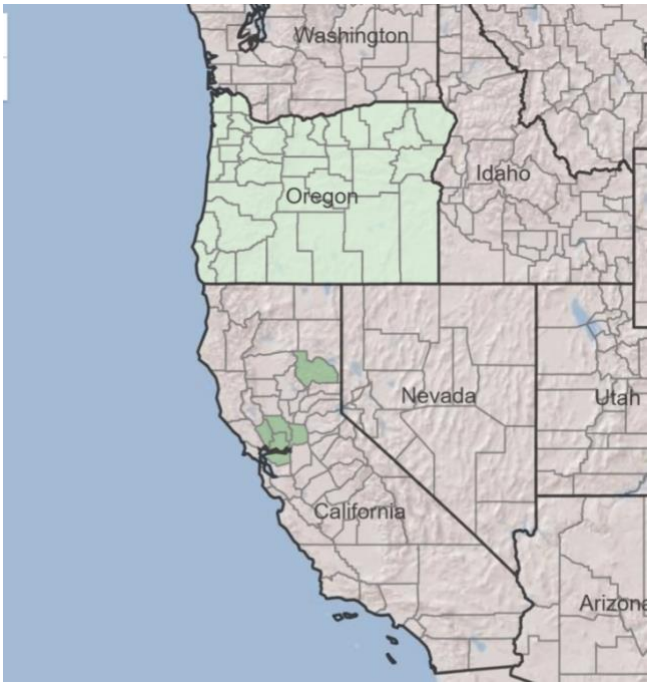
Plant Propagation Protocol for *Juglans hindsii*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/*2022*/*JUHI.pdf*


("*Juglans hindsii* – Northern," 2020)


("*Juglans hindsii," 2022)*

TAXONOMY	
Plant Family	
Scientific Name	Juglandaceae
Common Name	Walnut
Species Scientific Name	
Scientific Name	*Juglans hindsii* Jepson (Schoch, 2020)
Varieties	N/A
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	*Juglans californica* ("Northern," 2008)
Common Name(s)	Northern California Walnut (USDA) Hinds's Black Walnut
Species Code	JUHI (USDA)
GENERAL INFORMATION	
Geographical range	This species is native to Oregon and Central and Northern California. (USDA) In California it can be found (and usually limited to) in Fresno, areas of Central California and the San Francisco Bay area. Native to California and limited to California. ("Northern California black," n.d.) No other information found about the specific location of this species in Oregon.

	  (USDA)
Ecological distribution	Occurs widely in unmanaged habitats, especially riparian areas. (Porter et al., 2018) Intermittently flooded or saturated riparian corridors. Floodplains, stream banks and terraces. ("*Juglans hindsii* and," 2021)
Climate and elevation range	Annual precipitation that is ideal for this species is generally 10-80 inches, summer precipitation - 0.14-1.5 inches, coldest temperatures 39-55ºF, hottest temperature 63.5-80.7ºF. Can be found at elevations: -6-6244 feet. ("Northern California black," n.d.)

	Alternatively, another source says this tree can found at elevations only below 300 meters. (“Jepson eFlora,” 2022)
Local habitat and abundance	Rocky and gravelly well-drained soils, by the coast, along rivers and streams and occasionally to the slopes of the Napa region. (Fern, n.d.)
Plant strategy type / successional stage	A vigorous disease-resistant and drought-tolerant tree. Hardy but do not succeed in colder temperatures of the country. (Fern, n.d.)
Plant characteristics	This is a large species tree that reaches a height of 30-60 feet with a dingle erect trunk without branches for 10-40 feet. The trunk is generally 5-6 feet in diameter at the base. Each leaf gets to roughly one foot long with up to 20 leaflets. Leaflets alternate. The nut has a smooth, brown shell containing a small edible nut. In flower from May to June. (“Northern California black,” n.d.)
PROPAGATION DETAILS (Randhawa, 2011)	
Ecotype	Pleasant Grove, California
Propagation Goal	rootstocks used for micropropagation. Micropropagation has the immense advantage of generating a large number of identical plants in a much shorter amount of time than conventional propagation methods.
Propagation Method	Vegetative
Product Type	Micro Paradox obtained cultures grown at UC Davis. Success in rooting cuttings from tissue culture has increased significantly compared to the rooting of hardwood walnut cuttings.
Stock Type	Petri dishes up until the active phase. Anderson pots for active phase.
Time to Grow	Not specified
Target Specifications	Small trees to be bought by nurseries. Sought out for their vigor and resistance to certain bacteria and pests.
Propagule Collection Instructions	Not specified
Propagule Processing/Propagule Characteristics	Not specified
Pre-Planting Propagule Treatments	Nodal sections from actively growing shoots are sterilized with 1% sodium hypochlorite and planted onto DKW medium.
Growing Area Preparation / Annual Practices for Perennial Crops	Cultures need to be sterilized before any further steps.

Establishment Phase Details	Cultures are maintained in the light for 12 hours a day at 72-75ºF and in the dark for 12 hours at 75ºF. Cultures are examined daily for any contamination and clean cultures are sub-cultured every 3 weeks. Success rates are impressive and just 100 cuttings can produce 1.4 million cuttings in 6 months.
Length of Establishment Phase	Not specified
Active Growth Phase	The cuttings are harvested and planted in DKW root-induction medium. The rooted cuttings are then transferred to sunshine #4 potting mix. 95% or greater humidity levels are maintained.
Length of Active Growth Phase	2 weeks.
Hardening Phase	After 2 weeks in the greenhouse, plants are moved to a shade house for hardening. Air pruning of the root system is promoted by open-bottom pot-design and open-mesh bench design.
Length of Hardening Phase	Not specified
Harvesting, Storage and Shipping	Plant height varies greatly. Since taller plants and plants with bigger leaves restrict the growth of smaller plants by shading, frequent categorizing and moving of plants is utilized. Plants are categorized as big or small and are separated so small plants have more light and room to grow larger.
Length of Storage	Not specified
Guidelines for Outplanting / Performance on Typical Sites	Seedlings should be planted to their permanent locations as soon as possible and given some protection for their first winter or two since they are tender when young. Flowers blooming depend on suitable conditions from the previous summer. Flowers can be destroyed by even short periods down to -2ºC. (Fern, n.d.) The micro-propagated trees, once planted, are uniform, show the promised vigor and have high stands. When planted in February, they are vigorous enough to bloom in June. (“Northern,” 2008) Micropropagation for walnut trees has been proven to be more successful than grafting practices. And the plants produced were more vigorous and resistant to certain pests. (Lopez, n.d.)
Other Comments	This tree is listed as seriously endangered on the California Native Plant Society Rare Plant Inventory.
INFORMATION SOURCES	

References	See Below
Other Sources Consulted	See Below
Protocol Author	Karinna Gensert
Date Protocol Created or Updated	05/21/2022

References

Fern, K. (n.d.). Juglans hindsii - jeps. ex r.e.sm. Retrieved May 22, 2022, from https://pfaf.org/user/Plant.aspx?LatinName=Juglans+hindsii

Jepson eFlora: Taxon page. (2022). Retrieved May 22, 2022, from https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=29568

Juglans hindsii - Northern California Black Walnut. (2020, June 1). Retrieved May 18, 2022, from https://spain.inaturalist.org/taxa/54502-Juglans-hindsii

Juglans hindsii and Hybrids Forest & Woodland Special Stands and Semi-Natural Alliance. (2021). Retrieved May 22, 2022, from https://vegetation.cnps.org/alliance/34

Juglans hindsii. (2022). Retrieved May 19, 2022, from https://www.calflora.org/app/taxon?crn=8943

Lopez, J. (n.d.). Walnut Tissue Culture: Research and Field Applications. Retrieved May 19, 2022, from https://www.nrs.fs.fed.us/

Northern California black walnut, juglans hindsii. (n.d.). Retrieved May 21, 2022, from https://calscape.org/Juglans-hindsii-(Northern-California-Black-Walnut)

Northern California walnut. (2008, November 12). Retrieved May 21, 2022, from https://eol.org/pages/595007/articles

Potter, D., Bartosh, H., Dangl, G., Yang, J., Bittman, R., & Preece, J. (2018). Clarifying the conservation status of Northern California black walnut (juglans hindsii) using microsatellite markers. Retrieved May 21, 2022, from https://bioone.org/journals/madro%C3%B1o/volume-65/issue-3/0024-9637-65.3.131/Clarifying-the-Conservation-Status-of-Northern-California-Black-Walnut-iJuglans/10.3120/0024-9637-65.3.131.full

Randhawa, P. (2011). Micropropagation of Walnut Rootstocks. Retrieved May 19, 2022, from http://admin.ipps.org/uploads/61_040.pdf

Schoch, C. (2020, January 1). Taxonomy browser (juglans hindsii). Retrieved May 21, 2022, from https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=91216

USDA. (n.d.). Retrieved May 21, 2022, from https://plants.sc.egov.usda.gov/home/plantProfile?symbol=JUHI

Other Sources Consulted

Claveria, E., & Dolcet-Sanjuan, R. (1996, January 1). Micropropagation of walnut (juglans Regia L.). Retrieved May 19, 2022, from https://www.researchgate.net/publication/307612953_Micropropagation_of_Walnut_Juglans_regia_L

Payghamzadeh, K. (2011, January 17). (PDF) in vitro propagation of walnut -a review. Retrieved May 22, 2022, from https://www.researchgate.net/publication/267835088_In_vitro_propagation_of_walnut_-A_review