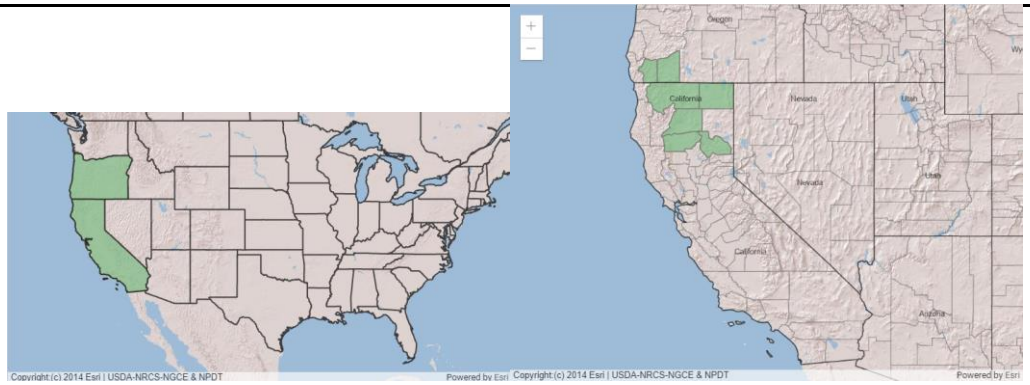
Plant Propagation Protocol for *Hesperocyparis bakeri*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/2024/HEBA5


Full image of tree[10] and closer image of branch with cones[9] credits.

TAXONOMY	
Plant Family	
Scientific Name	Cupressaceae[1]
Common Name	Cypress Family[1]
Species Scientific Name	
Scientific Name	*Hesperocyparis bakeri* (Jeps.) Bartel[1]
Varieties	No listed varieties[1]
Sub-species	No listed sub-species[1]
Cultivar	
Common Synonym(s)	*Cupressus bakeri* Jeps.
Common Name(s)	Modoc Cypress[1], Baker's Cypress[2], Siskiyou Cypress[2]
Species Code (as per USDA Plants database)	HEBA5
GENERAL INFORMATION	

Geographical range	 Northern California and southern Oregon[1]
Ecological distribution	The Modoc Cypress is only found in disjunct stands and isolated groves in the dry volcanic Sierra Nevada, the Cascade Ranges, and the Siskiyou Mountain region[6].
Climate and elevation range	Modoc cypress is generally found at elevations from 3,772 to 6890 feet[6]. It is found in the dryer parts of the Sierra Nevada and Cascade Mountain, however at that altitude the weather is generally cool with snow in the winters and a relatively dry summer[11].
Local habitat and abundance	The Modoc Cypress is found in environments commonly with Douglas-fir (*Psuedotsuga menzeisii*), Ponderosa pine (*Pinus ponderosa*), Fir and spruce (*Abies* spp., *Tsuga* spp.), and Lodgepole pine (*Pinus contorta*).[2] They are found in Western hardwood forests or Chaparral and mountain shrub landscapes.[2] Additional species commonly associated with Modoc cypress include; Sugar Pine (*Pinus lambertiana*), Brewer Oak (*Q. Garryana* ssp. *breweri*), Sadler Oak (*Q. sadleriana*), Incense-Cedar (*Calocedrus decurrens*), Brewer Spruce (*Picea breweriana*), Pacific Yew (*Taxus brevifolia*), Juneberry (*Amelanchier pallida*), Greenleaf Manzanita (*Arctostaphylos patula*), Big Sagebrush (*Artemisia tridentata*).[2]
Plant strategy type / successional stage	The Modoc Cypress saplings do not respond well to shade and can only grow in direct sunlight, leading to competition eradicating hoards of young trees.[2,7] They are a fire-adapted species that has serotinous cones that release seeds in the presence of heat and can often be one of the first colonizers on a previously burned site.[2]
Plant characteristics	The Modoc Cypress is a large tree growing up to 30m usually found on lava flow sites with a broadly columnar crown that is sparse.[8]
PROPAGATION DETAILS FOR *Chamaecyparis lawsoniana*: FROM SEED Information by: Lee Riley[3]	
Ecotype	Coastal northern California through northern Oregon Similar climate and distribution as the Modoc Cypress, so it is likely the propagation instructions are similar between the two Cypress species.
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	163 ml (10 in3) container
Time to Grow	22 weeks
Target Specifications	A root system firm in the container
Propagule Collection Instructions	Female cones are green and mature to brown, which generally occurs when they are ready to collect in the fall. They produce seed relatively early every year, but the production is heavier every 4 to 5 years.

Propagule Processing/Propagule Characteristics	According to the University of Wisconsin, Cedar cones should be dried in the sun, then shaken clean of the seeds to extract them.[5]
Pre-Planting Propagule Treatments	Seeds are placed in fine mesh bags into a 1% hydrogen peroxide (3:1 water/3% hydrogen peroxide) soak for 24 hours, rinsed, and placed in water for an additional 24 hours. The bags are placed in sealed containers in refrigeration at 1 to 3 °C for 30 days. It is very important to check seeds weekly to check for mold. If mold is found, seeds should be treated by spraying a 1% hydrogen peroxide solution.
Growing Area Preparation / Annual Practices for Perennial Crops	Greenhouse growing facility at the Dorena Genetic Resource Center in Cottage Grove, Oregon. Seeds are directly sown into containers and lightly covered with nursery grit. Growing medium used is 40:20:20:20 peat:composted fir bark:perlite:pumice with Nutricote controlled release fertilizer (18N:6P2O5:8K2O with minors; 180-d release rate at 21 °C) at the rate of 0.9 g Nutricote per 163 ml container.
Establishment Phase Details	Germination is fairly even and is usually complete in 3 weeks. Once the majority of germination has occurred, seedlings are fertilized for 3 weeks with soluble 12-2-14-6Ca-3Mg at 75 to 100 ppm.
Length of Establishment Phase	4 weeks
Active Growth Phase	During the growing season, the choice of fertilizater is dependent on the weather. Soluble fertilizer (20-9-20 NPK, 20-18-18 NPK, or 17-5-24 NPK) at a rate of 100 to 150 ppm is applied weekly throughout the growing season.
Length of Active Growth Phase	20 weeks
Hardening Phase	No dry-down is done to induce dormancy. Seedlings are moved to an outdoor growing area in early September.
Length of Hardening Phase	None needed as no dry-down is done.
Harvesting, Storage and Shipping	Harvest Date: Mid-October Storage Conditions: No storage except in outdoor growing area. Plants are well irrigated prior to shipping and shipped in containers. No information is provided on how long they can handle shipping.
Length of Storage	No storage information provided.
Guidelines for Outplanting / Performance on Typical Sites	Seedlings are usually outplanted in fall.
Other Comments	This propagation information was conducted for *Chamaecyparis lawsoniana*, which is another Cypress native to a similar area of California and Southern Oregon[4]. Rodents are known to consume cypress seeds and although Cypress trees are an undesirable snack, livestock can often browse on the young plants.[2]
INFORMATION SOURCES	

References	[1]United States Department of Agriculture. (2024a). Hesperocypari Bakeri. USDA plants database. https://plants.sc.egov.usda.gov/home/plantProfile?symbol=HEBA5 [2]Esser, Lora. 1994. Hesperocyparis bakeri. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: https://www.fs.usda.gov/database/feis/plants/tree/hesbak/all.html [2024, May 19]. [3]Riley, Lee E.; Kamakura, Renata. 2020. Propagation protocol for production of Container (plug) Chamaecyparis lawsoniana Plants 163 ml (10 in3) container; USDA FS - Dorena Genetic Resource Center Cottage Grove, Oregon. In: Native Plant Network. URL: https://NativePlantNetwork.org (accessed 2024/05/21). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. [4]Cypress, Lawson (Chamaecyparis lawsoniana). Woodland Trust. (n.d.). https://www.woodlandtrust.org.uk/trees-woods-and-wildlife/british-trees/a-z-of-british-trees/lawson-cypress/ [5]Brenner, W. H., & Cunningham, G. R. (n.d.). Collecting and planting seeds of cone-bearing trees. College Of Agriculture. https://erc.cals.wisc.edu/woodlandinfo/files/2017/09/G1649.pdf [6]Dodd, Richard S.; Afzai-Rafii, Zara; Power, Ariel B. 1990. Biodiversity within natural populations of Cupressus bakeri (Goosenest Mountain, California). Ecologia Mediterranea. 16: 51-57. [21914] https://www.persee.fr/doc/ecmed_0153-8756_1990_num_16_1_1651 [7]Wagener, Willis W. and Quick, C. R. (1963) "Cupressus Bakeri-An Extension of the Known Botanical Range," Aliso: A Journal of Systematic and Floristic Botany: Vol. 5: Iss. 3, Article 10. Available at: https://scholarship.claremont.edu/aliso/vol5/iss3/10 [8]Earle, C. J. (2023, December 17). Hesperocyparis bakeri. The Gymnosperm Database. https://www.conifers.org/cu/Hesperocyparis_bakeri.php [9]Ives, T. (2002). Tree in habitat. Photograph. [10]Earle, C.J. (2010). Same tree, seen from a distance. Photograph. [11]“Climate.” Yosemite Field Station, University of California, Merced, 17 July 2023, snrs.ucmerced.edu/natural-history/climate#:~:text=Winters%20are%20generally%20cold%20and,falls%20from%20January%20through%20March.
Other Sources Consulted	
Protocol Author	Ainsley Lawler
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