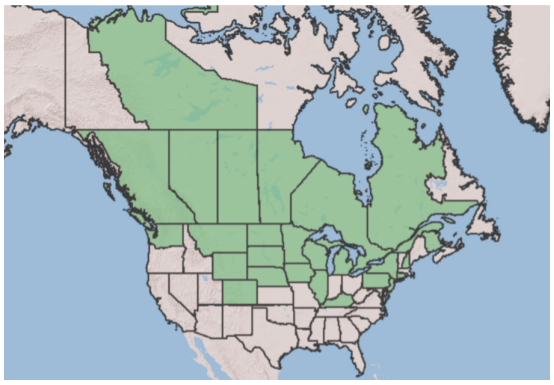
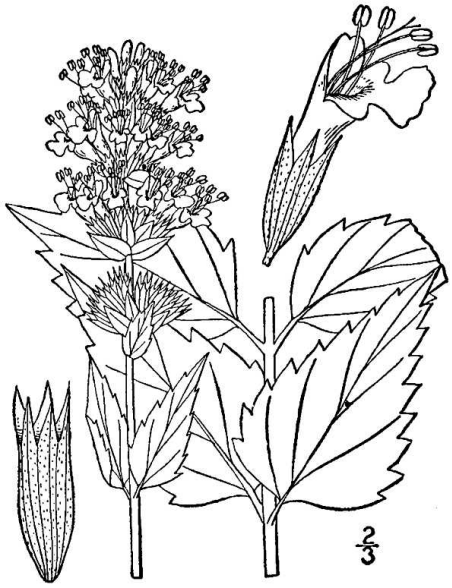
Plant Propagation Protocol for *Agastache foeniculum*
ESRM 412 – Native Plant Production
https://courses.washington.edu/esrm412/protocols/2021/AGFO.pdf



TAXONOMY	
Plant Family	
Scientific Name	Lamiaceae / Labiatae
Common Name	Mint family
Species Scientific Name	
Scientific Name	*Agastache foeniculum* (Pursh) Kuntze
Varieties	
Sub-species	
Cultivar	
Common Synonym(s) (include full scientific names, including variety or subspecies information)	*Agastache anethiodora* (Nutt.) Britton Many documented cultivars and hybrids are grown for commercial purposes, which includes but is not limited to (“Anise-Hyssop.”) : *Hyssop foeniculum* 'Alba' (syn. 'Alabaster'): pale green leaves and creamy white flowers *Hyssop foeniculum* 'Golden Jubilee': golden yellow foliage with lavender-blue flowers *Hyssop foeninulum* 'Licorice Blue': green foliage with lavender-blue flowers *Hyssop foeninulum* 'Licorice White’: medium green foliage with white flowers *Agastache* 'Black Adder': 2 to 3 feet high and 1 to 2 feet wide; black buds open to smoky red-violet flowers *Agastache* 'Blue Blazes’: 3 to 4 feet high and 2 to 3 feet wide; lavender-pink flowers

	Agastache 'Blue Fortune': 3 to 4 feet high; lavender-blue flowers *Agastache* 'Heatwave': 2 to 3 feet high; spikes of magenta-pink flowers on soft green leaves *A. foeniculum* often grows with and hybridizes with other native species. This partially contributes to its elusive nature and lack of identification outside of large populations where it may be commonly misidentified or not recognized among other *Agastache* Clayton ex Gronov (Corrigan).
Common Name(s)	Fragrant giant hissop, blue giant hissop, anise hissop, lavender giant hissop, blue fortune
Species Code (as per USDA Plants database)	AGFO
GENERAL INFORMATION	
Geographical range	This species is abundant in south central Canada but is considered rare elsewhere in its native range. Its distribution is north-central and northern North America in dry to mesic open forests and clearings in the montane zone. It is currently less common outside of hardiness zones 3 through 8 and there is little data about its distribution specific to the Pacific Northwest; see above maps for general distribution and distribution in Canada (Klinkenberg).
Ecological distribution	Prefers areas of full sun but is tolerant of partial shade. Thrives in well-drained, sandy loam soil. It is tolerant of other conditions that are typical of dry, upland woods, thickets, prairies, and shrubby barrens. It is drought tolerant but not very flood tolerant as excess water may cause root rot. It can tolerate clay-loam or gravelly loam soils with a wider range of pH (USDA NRCS 2017). It is very cold tolerant and can withstand freezing temperatures and even snowfall in winter months when most of the foliage dies back and its root system is well-developed underground.
Climate and elevation range	This species thrives in mid to high elevations from 4,000-10,000', especially in the midwest and Great Plains. Adapted to withstand annual precipitations of 15-80" with increased demands for rocky, well-drained soil in areas with higher expected rains. An annual precipitation of 50" is commonly tolerated, with drought conditions considered to be below 30".
Local habitat and abundance	In the midwest, *Agastache foeniculum is* commonly associated with *Callirhoe involucrata*, *Echinacea*

	purpurea, *Rudbeckia fulgida* var. *fulgida,* or *Solidago nemoralis*. It typically survives well with common prairie grasses or other understory plants that support pollinator habitats. There are few documented sightings west of Montana, but due to the prevalence of other *Agastache* species in the Pacific Northwest it is speculated to follow similar distributions given its hardiness and tolerance for cold (but not necessarily wet) conditions. *Agastache urticifolia* (Benth.) Kuntze, nettleleaf giant hyssop, naturally hybrizes with *A. foeniculum*, as do other species in the *Agastache* genus that is comprised of two distinct sections, *Chiastrandra* (syn: *Agastache*) and *Brittonastrum.* Given the tendency to hybridize, *A. foeniculum* is expected to be in Washington in regions with approximately 18 to 40" of yearly rainfall (Ogle et al., 2014; USDA NRCS 2019). The local habitat includes but is not limited to meadows, mountain brush, sage brush, shrub-steppe, ponderosa pine, aspen, woodlands, and spruce-fir communities (Hickman, 1993; Welsh et al., 2003). Electrophoretic enzyme analyses by Vogelmann and Gastony (1987) show that *Agastache scrophulariifolia* (Willd.) Kuntze is considered to be the closest relative of *A. foeniculum* (Pursh.) and as such may also be a viable candidate for reference of propagation methods and regional distribution or abundance (Corrigan).
Plant strategy type / successional stage	This plant has a fast to moderate growth rate but is naturally pest resistant and prevents browse and herbivory due to its scented, pubescent inflorescences that attracts pollinators but otherwise makes it unpalatable. It can withstand drought due to its deep taproot, spreads asexually via a creeping rhizome, and is readily self-seeding. Unlike other perennial herbs that are late successional and prefer shade and nutrient rich soil in the understory of developed forests, *A. foeniculum* can be a pioneer species that colonizes open, sunny areas (Mahr). Once one individual is established among competing vegetation, it can be competitive with other species since it can grow from dispersed seeds or runners.

Plant characteristics	A perennial forb/herb/subshrub that is usually mounding and tightly clumped.It is relatively short-lived with a longevity of 2 to 3 years (USDA, NRCS).. It has strong upright stalks and foliage with summer blooms that last from June through September. It is 2-4’ feet tall with a 2’-3’ spread. Its leaves are licorice scented and its falsely whorled inflorescences are 3-6” tall. The individual purple to blue flowers are ⅓’ long, and tubular with two lips as is characteristic of all plants in the mint family. The leaves are lanceolate to cordate with crenate to crenate-serrate margins. The adaxial surface of the leaves are a glabrous and a dull green featuring conspicuous veins that are more arcuate than pinnate. In contrast, the abaxial surface is a canescent with a dusty white appearance (Hilty).
	

PROPAGATION DETAILS	
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug) seedlings
Stock Type	262 ml (16 cubic ml) container, graduating to 10 cubic inches as roots mature
Time to Grow	5 months
Target Specifications	Healthy root development with roots and rhizome filling the soil profile in the container with a well developed crown. The plug should be firm in the container
Propagule Collection Instructions	Collect seeds from August to September after plants have bloomed, inflorescences have dried out, and seeds (nutlet) have hardened. Timing largely depends on how arid or dry the season has been. Inflorescences can be collected whole to process or small amounts of seeds can be collected by shaking them over a paper bag. These may be stored in a cool, dry place until cleaned.
Propagule Processing/Propagule Characteristics	Seeds may be separated from flower material by hand with a screen. An air screen cleaner with a 1.40 mm top screen and a solid bottom screen and light air can further clean the seeds. The seeds are orthodox and may be stored for up to a year in cool, dry conditions.
Pre-Planting Propagule Treatments	Seeds are dormant as self-seeding naturally occurs in fall and produces plants the following spring. Cold, moist stratification is not necessary but may be

	beneficial to break dormancy. Germination is highest with exposure to light and warmth. Seeds should be lightly sowed with barely any soil. In similar species, 90% germination is seen in warm environments of 75 degrees Fahrenheit (Riley).
Establishment Phase Details	Germination is usually complete within 1 to 4 weeks depending on ecotype and implementation of induced dormancy or cold, moist stratification. Night time temperatures should not drop to or below frost temperatures with 50 degrees fahrenheit acceptable by no less than 70 degrees fahrenheit ideal. Lower temperatures will not be detrimental to the plants but will delay establishment (Hoffman).
Length of Establishment Phase	2 weeks to 4 weeks
Active Growth Phase	Water regularly with good drainage but ensure that plants are never sitting in water or fully saturated. Fertilize once a week with a complete, water soluble fertilizer with micronutrients. These plants will do well with most fertilizers, with reports of Miracle Grow All Purpose Plant Food (15-30-15) being applied instead of fertilizers formulated by the nursery. If growth is vigorous trim back foliage may be trimmed back sparingly. Watch for rust, powdery mildew, and leaf spots (“Anise-Hyssop.”)
Length of Active Growth Phase	8 weeks to 16 weeks with approximately 10 to 12 weeks being standard.
Hardening Phase	Move to an outdoor growing area in full sun with well-drained sandy loam soil. Limit watering to once every 4 to 5 days. Water less if the weather is cool, water more if the weather is hot, but as previously emphasized do not overwater as it is tolerant of drought once established. To promote tap root development, more stem branching, and fuller growth, plants may be cut back to 12” tall. Do not mulch or place in clay soils as plants may succumb to winter injury.
Length of Hardening Phase	1 to 4 weeks (Riley).
Harvesting, Storage and Shipping	*Agastache* may be stored in the outdoor growing area until outplanting or in cold storage for 2 days (30 to 50 degrees Fahrenheit) before reaching the outplanting site. They should be irrigated well prior to shipment, and shipped in containers.
Length of Storage	Plants may be kept in outdoor growing areas through October. Transit times where they are in cold storage should be kept to a minimum.

Guidelines for Outplanting / Performance on Typical Sites	This species may be outplanted in fall to early winter at the latest. It is very robust when outplanted as long as it is placed in full, hot sun. Do not plant in wetland areas or clay soils. Winter and fall precipitation are of less concern since the plant dies back. Well-drained soil and less rainfall in the summer months is ideal with it successfully being grown throughout its native habitat from the Pacific Northwest to the Midwest. It takes 3 months to flower but keeps its blooms throughout the summer. At maximum growth it is 4' tall and up to 3' wide. Available data for similar species indicate high viability in germination and outplanting for this genus. Under optimum conditions, germination is 90 percent, with thinning being required during rapid growth.
INFORMATION SOURCES	
References and Works Consulted	See below
Protocol Author	Adrian Eric Burres
Date Protocol Created or Updated	05/05/2021

References and Works Consulted

Agastache foeniculum (Pursh) Kuntze nettleleaf giant hyssop. URL:

https://plants.usda.gov/core/profile?symbol=AGFO (accessed 05 May 2021),

Greensboro,

NC USA.

"Agastache Foeniculum - Plant Finder." *Missouri Botanical Garden*, 2018,

www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=d5

4.

"Anise-Hyssop." *Anise-Hyssop | The Morton Arboretum*, The Morton Arboretum, 2021,

www.mortonarb.org/trees-plants/tree-plant-descriptions/anise-hyssop.

Corrigan, Elizabeth. 2002. Agastache scrophulariifolia (Willd.) Kuntze (purple giant hyssop)

New England Conservation Program Conservation and Research Plan for New England.

New England Wild Flower Society, Framingham, Massachusetts, USA.

Hilty, John. *Anise Hyssop (Agastache Foeniculum)*, 2005, www.illinoiswildflowers.info/prairie/plantx/anise_hyssopx.htm.

Hoffman, George R. 1985. Germination of Herbaceous Plants Common to Aspen Forests of Western Colorado. Bull. of the Torr. Bot. Club 112:409-413.

Klinkenberg, Brian. (Editor) 2020. *E-Flora BC: Electronic Atlas of the Plants of British Columbia* [eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. [Accessed: 2021-05-05 8:05:14 AM]

Lint, H.; Epling, C. 1945. A revision of Agastache. The American Midland Naturalist. 33(1): 207-230.

Maguire, James D. and Alvin Overland. 1959. Laboratory Germination of Seeds of Weedy and Native Plants. Washington State Agricultural Experiment Station Circular 349, Pullman, WA. 15 p.

Mahr, Susan. "Anise Hyssop, Agastache Foeniculum." *Wisconsin Horticulture*, University of Wisconsin- Madison, 2020, hort.extension.wisc.edu/articles/anise-hyssop-agastache-foeniculum/#:~:text=Anise%20hyssop%20is%20easily%20started,cold%2C%20moist%20stratification%20improves%20germination.

McDonough, Walter T. 1969b. Seedling Growth of Ten Species from Subalpine Rangeland in Utah as Affected by Controlled Diurnal Temperature Alterations. American Midland Naturalist 82:276-279.

Nardozzi, Charlie. "All About Agastache." *American Meadows*, American Meadows, 2018, www.americanmeadows.com/perennials/agastache/all-about-agastache.

Riley, Lee E.; Fisher, Leslie. 2018. Propagation protocol for production of Container (plug) *Agastache urticifolia* Plants 262 ml (16 in3) container; USDA FS - Dorena Genetic

Resource Center Cottage Grove, Oregon. In: Native Plant Network. URL: http://NativePlantNetwork.org (accessed 2021/05/05). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.

St. John, Harold. 1963. Flora of Southeastern Washington and of Adjacent Idaho. 3rd edition. Outdoor Pictures. Escondido, CA.

Table 10.36 In: Baskin, C.J. and Baskin, J.M. Seeds: Ecology, Biogeography and Evolution in Dormancy and Germination, Academic Press, 1998. Chapter 10: A Geographical Perspective on Germination Ecology: Temperate and Arctic Zones, pages 331 to 458.

Tilley, D. and T. Pickett. 2019. Plant Guide for nettleleaf giant hyssop (Agastache urticifolia). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, ID. 83210.

USDA, NRCS. 2021. The PLANTS Database (http://plants.sc.egov.usda.gov, 05/05/2021). National Plant Data Team[NRCS] USDA Natural Resources Conservation Service.