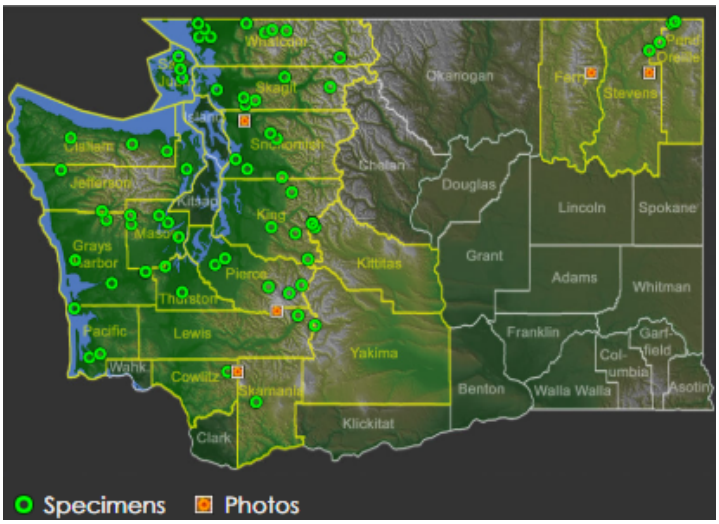
Plant Propagation Protocol for *Euphrasia nemorosa*

ESRM 412 – Native Plant Production

URL: https://courses.washington.edu/esrm412/protocols/*[2025]*/*[EUNE3.pdf]*

TAXONOMY	
Plant Family	
Scientific Name	*Euphrasia nemorosa*[10]
Common Name	Common Eyebright[10]
Species Scientific Name	
Scientific Name	*Euphrasia nemorosa* (Pers.) Wallr.[10]
Varieties	
Sub-species	ssp. *borealis* (Townsend) Yeo[10]
Cultivar	
Common Synonym(s)	*Euphrasia americana* auct. p.p. *Euphrasia arctica* Lange ex Rostr. ssp. *borealis* (Townsend) Yeo *Euphrasia borealis* (Townsend) Wettst. *Euphrasia canadensis* auct. non Townsend *Euphrasia curta* (Fr.) Wettst. *Euphrasia pectinata* auct. non Ten. *Euphrasia tatarica* auct. non Fisch. ex Spreng.[10]
Common Name(s)	Common Eyebright, Hairy Eyebright[6, 7, 5, 10]
Species Code (as per USDA Plants database)	EUNE3[10]
GENERAL INFORMATION	
Geographical range	USA: CT , MA , ME , MI , MN , NH , VT , WA[7] Canada: AB , BC , NB , NL , NS , ON , PE , QC[7] Occurs West of the Cascades in WA; Alaska to Oregon, east to Alberta and Montana; eastern North America.[6]

	 Distribution Map Source: Flora of North America.[5]  Distribution Map Source: Burke Herbarium.[6]
Ecological distribution	Occurs in fields, roadsides, and disturbed, open areas.[6,7] Grows in dry or moist and grassy, gravelly, or sandy habitats; pastures, roadsides, cliff ledges, wood margins, coastal or inland.[5]
Climate and elevation range	Elevation: 0-1300m[5]
Local habitat and abundance	Native Range: Europe Hemiparasitic annual Primarily found in the temperate biome. Native to:

	Austria, Baltic States, Belarus, Belgium, Central European Russia, Czechia-Slovakia, Denmark, East European Russia, Finland, France, Germany, Great Britain, Ireland, Netherlands, North European Russia, Northwest European Russia, Norway, Poland, Romania, Spain, Sweden, Switzerland, Ukraine Introduced into: Alaska, Alberta, British Columbia, Idaho, Maine, Massachusetts, Michigan, Minnesota, Montana, New Brunswick, New Hampshire, New Zealand North, New Zealand South, Newfoundland, Nova Scotia, Ontario, Oregon, Prince Edward I., Québec, Vermont, Washington[3]
Plant strategy type / successional stage	Hemiparasitic[3,6]
Plant characteristics	Semi-parasitic annual. Hairy stem that is 5-20cm tall. Has cauline leaves that are opposite and alternate, ovate to broadly elliptic, and deeply toothed. Flowers are white with a violet tinge.[6]
PROPAGATION DETAILS: FROM SEED	
Ecotype	Experimental references collected seeds from Roborough Down, S. Devon, v.c. 3, collected in 1952[11], as well as Castle Hill Local Nature Reserve, East Sussex; Meridian Business Park, Leicester; and Bloody Oaks Triangle, Tickercote, Rutland.[2]
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container
Stock Type	Container-grown For open-ground cultivation, bituminized paper pots may be used.[12] Otherwise, plastic pot cultivation may be done.[2]
Time to Grow	Typically 4-10 weeks, but could be up to 17 weeks.[12]
Target Specifications	5-20cm tall[6]
Propagule Collection Instructions	Best germination rates have been shown from collecting seeds in late summer or autumn (prior to seed dehiscence), with seed sorting and cold storage.[1, 12]
Propagule Processing/Propagule Characteristics	Seeds are 1 to 2 mm long and narrowly winged.[4] Loss of viability has been shown through seed storage.[11]

	Euphrasia fruits are very hygroscopic, so they do not open until they are fully dry.[8]
Pre-Planting Propagule Treatments	Seed cleaning can be done by sieving and winnowing to remove smaller seeds and improve germination rates. Seeds should be dried prior to fridge storage. Seeds have dormancy; cold stratification is needed for germination, which can be done through overwintering outside or forced germination via fridge.[1, 11]
Growing Area Preparation / Annual Practices for Perennial Crops	Growing Media: Ideally, loam turf from which wild plants are growing. Presence of peat moss aids in cultivation.[12] Cultivation results have been shown when using Melcourt Sylvamix Special growing medium, which contains Melcourt Sylvafibre, which is composted woodfibre/fine bark, coir and a wetting agent.[9] John Innes compost no. 1 has also been used for successful cultivation of *Euphrasia.*[12] Container Type: For open-ground cultivation, bituminized paper pots may be used.[12] Otherwise, plastic pot cultivation may be done.[2] Container Size: 9cm^2 Distance from Host Plant: 2.5cm[12]
Establishment Phase Details	Frost treatment is required before germination. Loss of germination through storage can be overcome by seeding within a few weeks after the seed ripens.[11] After seeding into pots, the pots can be left outside over winter to experience natural cold seed stratification.[2] Germination success has been found to be around 40-50%, depending on seed condition (shrivelled, intermediate, or plump; plump seeds have a 50% germination rate).[1]
Length of Establishment Phase	2-4 weeks[11, 12]
Active Growth Phase	A host is required for significant growth, and must be introduced within a few days of germination. If a host is not introduced within the first two weeks, the plant will often die. Ideal hosts are leguminous or grass species, rather than forbs or woody plants. It has been found that *Medicago lupulina* and *Plantago lanceolata* are good hosts for *Euphrasia nemorosa*, with *Medicago lupulina* being superior to *Plantago lanceolata*.[12]

	Care includes: Regular watering, weekly randomizing pot locations, and removing foreign weed seedlings.[2]
Length of Active Growth Phase	72-95 days[12] Germination in April, May, June, and then actively grow for several weeks before attaching to a host plant and forming true leaves and undergoing sudden stem elongation, which ends in mid-June.[8]
Hardening Phase	Late out-planting gives little advantage, so potted plants can be out-planted when the roots bind to the soil sufficiently.[1, 12]
Length of Hardening Phase	Mid-June - September[8] The end of the growing season for *Euphrasia* is typically late September.[1, 12]
Harvesting, Storage and Shipping	*Euphrasia* seedlings should be transplanted after germination in order to avoid wasting pot capacity or host-plant supplies. Transplanting can be done when cultivating with pots or in open ground. Transplanting should be done with the host plants and the *Euphrasia* seedlings at the same time.[12]
Length of Storage	Seedlings can be stored for several weeks before host attachment and rapid growth occur.[8]
Guidelines for Outplanting / Performance on Typical Sites	Flowering occurs in mid-June and continues until mid-July[8], which means it takes about 2 months for *Euphrasia* to flower. Height of the stem is typically 5-20cm tall.[6]
Other Comments	Seedlings can also be directly harvested from their turf.[12]
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Protocol Author	Simon Edgecumbe
Date Protocol Created or Updated	05/18/25