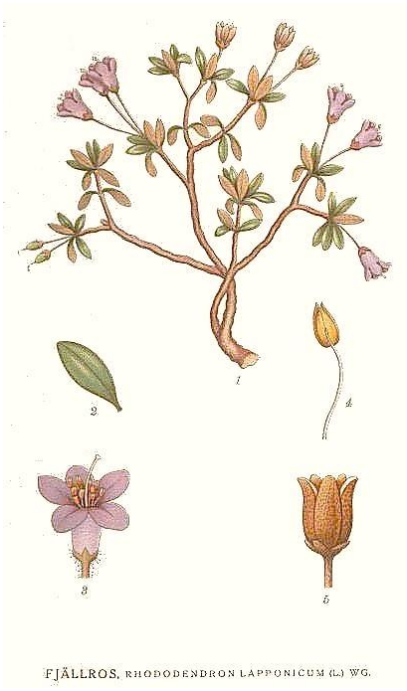
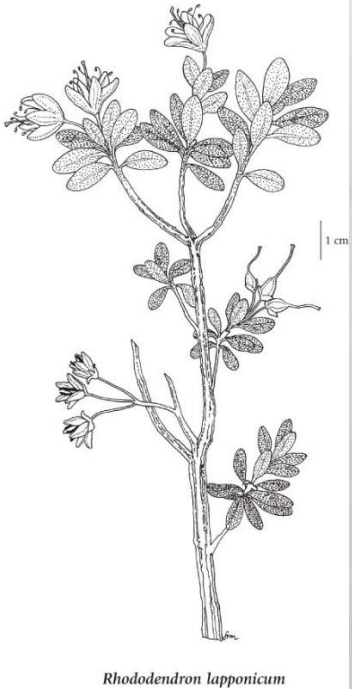
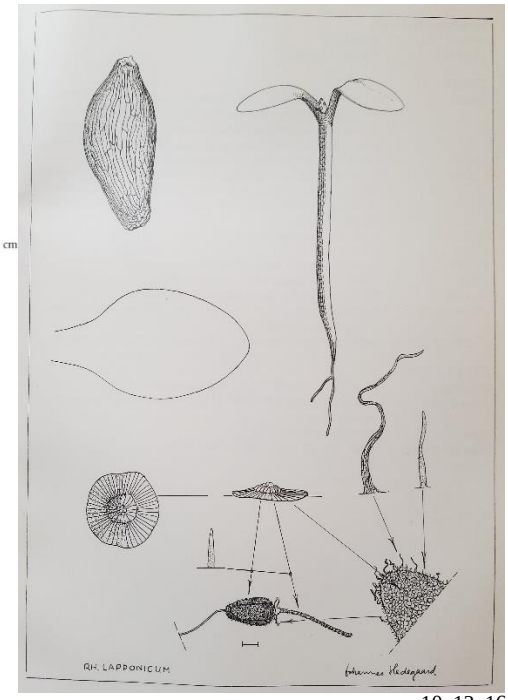
Plant Propagation Protocol for *Rhododendron lapponicum*
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/RHLA2.pdf

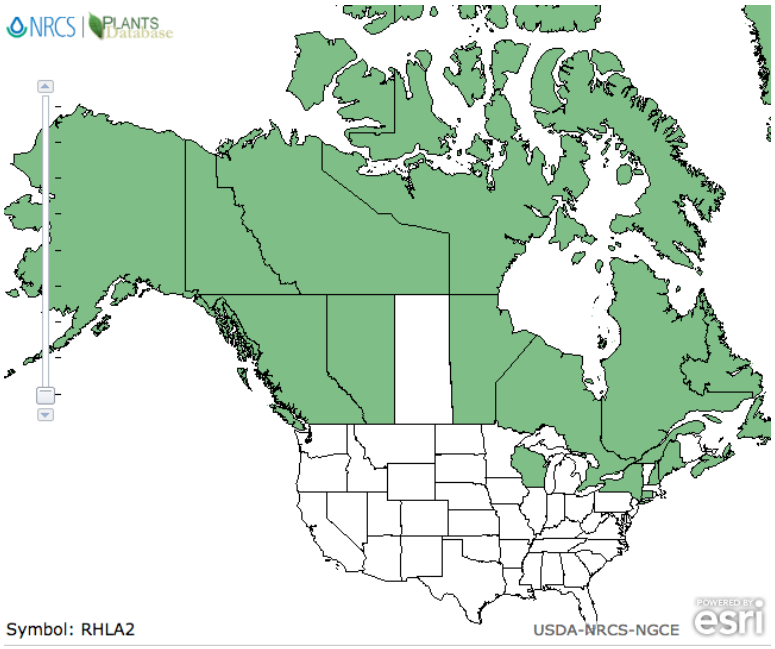


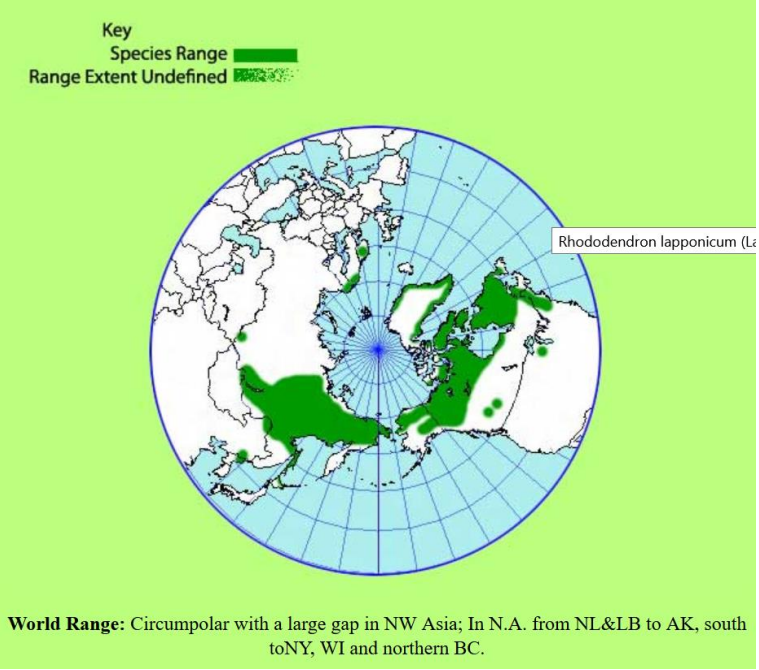




Source: (Left to Right - Lindman, 1926, Douglas, 1999, and Hedegaard, 1980)[10, 12, 16]

TAXONOMY	
Plant Family	
Scientific Name	Ericaceae[20]
Common Name	Heath family[20], Crowberry family[14]
Species Scientific Name	
Scientific Name	*Rhododendron lapponicum* (L.) Wahlenb.[20]
Varieties	The USDA Plants database includes the following varieties as *Rhododendron lapponicum's* subordinate taxa. *Rhododendron lapponicum* (L.) Wahlenb. var. *lapponicum* *Rhododendron lapponicum* (L.) Wahlenb. var. *parvifolium* (M.F. Adams) Herder[20]
Sub-species	None[17, 19, 20]
Cultivar	None[17, 19, 20]
Common Synonym(s)	*Azalea ferruginosa* Pall. *Azalea lapponica* L. *Azalea parvifolia* (Adams) Kuntze *Rhododendron confertissimum* Nakai

	Rhododendron lapponicum subsp. *Parvifolium* (Adams) T. Yamaz. *Rhododendron palustre* Turcz. *Rhododendron parviflorum* F. Schmidt *Rhododendron parvifolium* Adams *Rhododendron parvifolium* subsp. *Confertissimum* (Nakai) A.P. Khokhr.[17, 19]
Common Name(s)	Lapland rosebay[20]
Species Code (as per USDA Plants database)	RHLA2[20]
GENERAL INFORMATION	
Geographical range	*R.* lapponicum's circum-polar range includes North America's Alaska, Canada, and Greenland, Europe's Scandinavia and Russia, and Siberia and Northern Japan in Asia.[1, 7, 11]  Source: (USDA, 2018)[20]

	 Source: (Central Yukon Species Inventory Project, 2018)[4]
Ecological distribution	*R. lapponicum* is found in the arctic tundra and is a circumpolar species that prefers limestone-rich clay, moss, and peat or igneous and serpentine soil types.[5, 6, 8]
Climate and elevation range	*R. lapponicum* prefers cold arctic conditions and alpine elevations up to 6,000 feet.[6, 8]
Local habitat and abundance	Because *R. lapponicum* is circum-polar, it is found in a variety of habitats and therefore does not have any commonly associated species.[1, 6, 8, 11]
Plant strategy type / successional stage	*R. lapponicum* is stress-tolerant to arctic and alpine environmental conditions.[1, 6, 8, 11]
Plant characteristics	*R. lapponicum* is a freely branched, dwarf prostrate shrub.[1, 5, 6, 7, 8, 11] **Growth:** Spreading to upright with a gnarled appearance that grows up to 3 feet tall.[1, 5, 6, 7, 8, 11] **Leaves:** Elliptic, densely lepidote, oval to oblong, and 0.25 to 0.5 inches long with bicolored scales. Apex and base are obtuse to rounded.[1, 5, 6, 7, 8, 11] **Flowers:** In terminal, umbel-like cluster 3-6, broadly campanulate, purple, .5 in across, stamens 5-10. Blooming in June to July.[1, 5, 6, 7, 8, 11] **Fruit:** A 3-5mm oblong furrowed capsule atop a glabrous style with a persistent calyx. [6, 8, 11, 12]

PROPAGATION DETAILS	
Patent: Cai Yanfei, LI Shifeng, LI Shufa, Xie Weijia, & Song Jie. "Method for cuttage propagation of rhododendron lapponicum" (2012).[3]	
Ecotype	N/A
Propagation Goal	Cuttings[3]
Propagation Method	Vegetative propagation through cuttings.[3]
Product Type	Container (plugs)[3]
Stock Type	N/A
Time to Grow	Longer than 60 days[3]
Target Specifications	N/A
Propagule Collection Instructions	Cut a stem from an extant (3-5 years old) *Rhododendron lapponicum*'s semi-lignified branch which is absent of pests and disease damage. The cutting should retain 2-3 complete leaves at the top of the cutting.[3]
Propagule Processing/Propagule Characteristics	N/A
Pre-Planting Propagule Treatments	The base of the cuttings should be dipped in rooting reagent A or B before striking into the cuttage substrate.[3]
Growing Area Preparation / Annual Practices for Perennial Crops	Creation of a cuttage substrate that consists of a 1:3 to 1:4 mixture of peat and pearlite by volume ratio.[3] Creation of rooting reagent A: includes IBA (indole-3-butyric acid) 0.8-1.0% and thiophanate-methyl 2-4%.[3] Creation of rooting reagent B: includes IBA 0.015-0.02% and thiophanate-methyl 1-2%.[3]
Establishment Phase Details	The seedlings should be provided with intermittent spray irrigation and should have a mass water content of 60-65%. Additionally, the air humidity should be maintained above 80% from the time of cutting to the rooting of a seedling.[3]
Length of Establishment Phase	60 days[3]
Active Growth Phase	N/A
Length of Active Growth Phase	N/A
Hardening Phase	N/A
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	N/A
Length of Storage	N/A
Guidelines for Outplanting / Performance on Typical Sites	N/A
All Available Literature [1, 2, 5, 6, 9, 12, 16, 17, 20, 23, 24, 30]	
Ecotype	N/A
Propagation Goal	Plants[2, 18]
Propagation Method	Seed[2, 18]

	The majority of literature on *Rhododendron* propagation discusses the use of a wide range of propagation techniques including seed germinates, vegetative propagation and cuttings, grafting and micropropagation.[24, 25, 31] However, because *R. lapponicum* is notoriously difficult to grow in cultivation, information is absent for *R. lapponicum* other than for seed germination and the above patent.[3]
Product Type	Container (plugs)[2, 18]
Stock Type	N/A
Time to Grow	15-24 months[18]
Target Specifications	N/A
Propagule Collection Instructions	Seed should be harvested from mature fruit in the fall as soon as the capsules change color from green to brown. The seeds can be removed by threshing and air-screening to separate the chaff from the seeds.[21]
Propagule Processing/Propagule Characteristics	*R. lapponicum* has 0.5-1 mm elongate, unwinged seeds that exhibit physiological dormancy. These seeds reside in oblong capsules that split open to release large quantities of seed upon ripening. Refer to the Hedegaard image above for a visual depiction.[2, 12, 21]
Pre-Planting Propagule Treatments	The literature states that *R. lapponicum* is best sown as ripe seed with no need for pre-treatment.[5, 17] However, Baskin from the University of Kentucky states that seeds benefit from a 70-110 day period of cold-moist stratification before germination can occur in standard greenhouse temperatures.[2]
Growing Area Preparation / Annual Practices for Perennial Crops	The author Cox noted a novel way of cultivation by sowing seeds directly atop a peat block which was placed in shallow water in an outside setting.[6]
Establishment Phase Details	*R. lapponicum* seed should be surface sown in the fall in a greenhouse bed full of humus-rich, lime-free (pH 4.5-5.5), well-draining soil, such as a sandy loam.[17] As is common with the genus *Rhododendron, R. lapponicum* requires diurnal lighting during the germination process.[9, 21]
Length of Establishment Phase	Seeds will germinate in 1-3 weeks depending on the quality, age, and pretreatment of the seed.[2, 13, 18]
Active Growth Phase	Once the plant has germinated and developed true leaves, it should be watered with general purpose water-soluble fertilizer and be moved into larger pots as needed.[9, 13, 18]
Length of Active Growth Phase	Species of the Rhododendron genus will develop 2-4 true leaves Active Growth Phase be given between 9-12 months.[13, 18]
Hardening Phase	N/A

Length of Hardening Phase	Due to difficulties growing *R. lapponicum,* it is recommended to continue growing the species in the nursery for a second growing season to properly harden the species for outplanting.[13]
Harvesting, Storage and Shipping	N/A
Length of Storage	N/A
Guidelines for Outplanting / Performance on Typical Sites	Prefers well-drained soils and sites with a lot of moisture.[22] Careful attention should be given to weeding around *R. lapponicum* after outplanting because its root system is very sensitive to competition.[17]
Other Comments	*R. lapponicum* is named after Lapland in Northern Finland.[1]
INFORMATION SOURCES	
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