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Plant Propagation Protocol
ESRM 412 – Native Plant Production

TAXONOMY	
Family Names	
Family Scientific Name:	*Pyrolaceae*
Family Common Name:	Shinleaf
Scientific Names	
Genus:	*Pyrola*
Species:	*Chlorantha*
Species Authority:	(Sw.) Swartz, Olof Peter
Variety:	
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	
Common Synonym(s)	*Pyrola chlorantha* **Authority:** Sw. **Variety:** *convoluta* **Variety Authority:** (W. Bart.) Fern. *Pyrola chlorantha* **Authority:** Sw. Variety *paucifolia* **Variety Authority:** Fern. *Pyrola chlorantha* **Authority:** Sw. Variety *revoluta* **Variety Authority:** Jennings *Pyrola convoluta* **Authority:** W. Bart. *Pyrola oxypetala* **Authority:** Austin ex Gray *Pyrola virens* **Authority:** Schreb. *Pyrola virens* **Authority:** Schreb. **Variety:** *convoluta* **Variety Authority:** (W. Bart.) Fern. *Pyrola virens* **Authority:** Schreb. **Variety:** *saximontana* **Variety Authority:** Fern.
Common Name(s):	Greenflowered Wintergreen
Species Code (as per USDA Plants database):	PYCH
GENERAL INFORMATION	
General Distribution (geographical range	*Pyrola Chlorantha* as been documented growing in the following states Washington, Oregon, Arizona, Colorado, California, Alaska, Nevada, Ohio,

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(states it occurs in), ecosystems, etc):	Wisconsin, Wyoming, Utah, Idaho, South Dakota, Minnesota, Pennsylvania, Virginia, New Mexico, Nebraska, Michigan, Indiana, Ohio, New Jersey, New York, Connecticut, Vermont, Maine, New Hampshire, Massachusetts, and Rhode Island (1). Circumboreal in its range. (5)
Climate and elevation range	2000-3000 meters in Texas (3). 2600 – 3030 meters in Utah. (4)
Local habitat and abundance; may include commonly associated species	It is often found in dry woods in Wisconsin (2). *Pyrola Chlorantha* grows in moist coniferous woods in Texas (3).
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)	*Pyrola* Species are considered late successional (5).
PROPAGATION DETAILS	
Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the seed that was tested came from):	
Propagation Goal (Options: Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	Plants are the goal since the plant requires a specific micorrhizal fungus to grow and is also difficult to grow from seed that germinates infrequently (3).
Propagation Method (Options: Seed or Vegetative):	Seed or vegetative can both be used but both are difficult because the seeds germinate infrequently and the plant is intolerant of root disturbance during division (3).
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown hybrids, and/or Propagules (seeds, cuttings, poles, etc.))	Container plugs would be the product type because the plants are intolerant of root disturbance for bareroot production and require mycorrhizal fungi to be in the soil when they are transplanted.(3). Seeds would not be a good product because of infrequent germination and the need to plant near an established plant to have the necessary fungi in the soil (3).
Stock Type:	
Time to Grow (from seeding until plants are ready to be outplanted):	
Target Specifications (size or characteristics of target plants to be produced):	

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Propagule Collection (how, when, etc):	Divisions may be taken with care in the spring (3).
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Propagules must be planted in soil taken from around an established plant so that the correct mycorriza are present for *Pyrola Chlorantha* to grow (3).
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	Prefers a moist, sandy, acidic soil (3). Peat is a good inclusion in the media (3). The plant requires that at least some soil from an established plant be present so that myccoriazal interaction with the plant can happen (3).
Establishment Phase (from seeding to germination):	
Length of Establishment Phase:	
Active Growth Phase (from germination until plants are no longer actively growing):	
Length of Active Growth Phase:	
Hardening Phase (from end of active growth phase to end of growing season; primarily related to the development of cold-hardiness and preparation for winter):	
Length of Hardening	

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Phase:	
Harvesting, Storage and Shipping (of seedlings):	
Length of Storage (of seedlings, between nursery and outplanting):	
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	Does best in a cool area with partial shade and soil that remains somewhat moist in the summer (3).
Other Comments:	
INFORMATION SOURCES	
References:	(1) [USDA] plants database. Plants Profile for *Pyrola chlorantha* [Internet]. [cited 2007 May 13th[st]] available from http://plants.usda.gov/java/profile?symbol=PYCH (2) Robert Freckman Herbarium [University of Wisconsin]. Pyrola Chlorantha Plant details [Internet]. [Cited 2007 May 14[th]] available from http://wisplants.uwsp.edu/scripts/detail.asp?SpCode=PYRCHL (3) Plants for a Future Database c2003. Pyrola Chlorantha [Internet]. [Cited 2007 May 14[th]] available from http://www.pfaf.org/database/plants.php?Pyrola+chlorantha (4) R. Douglas Ramsey Remote Sensing and GIS Laboratories Department of Geography and Earth Resources Utah State University. 2007. Digital Atlas of the Vascular Plants of Utah [Internet]. [Cited 2007 May 14[th]] available from http://www.gis.usu.edu/Geography-Department/utgeog/utvatlas/family/pyro/pych.html (5) Coxon D. and Marsh J. 2001. Lichen chronosequences (postfire and postharvest) in lodgepole pine (*Pinus contorta*) forests of northern interior British Columbia Canadian Journal of Botany 79: 1449-1464.
Other Sources Consulted (but that contained no	http://www.dnr.state.oh.us/dnap/Abstracts/P/pyrochlo.htm http://ct-botanical-society.org/galleries/pyrolachlo.html

pertinent information):	http://www.ibiblio.org/pfaf/cgi-bin/arr_html?Pyrola+chlorantha du juan hua ke et al. 2005. Ericaceae. Flora of China volume 14:242-517. Available online at http://flora.huh.harvard.edu/china/mss/volume14/ERICACEAE-part1.pdf Yaki G. Vascular Plants of the Weaselhead Natural Area. Available online at http://www.weaselhead.org/learn/plants/weaselhead_plants.pdf Shearer R. and Kempf M. Coram. 1999. Experimental Forest: 50 Years of Research in a Western Larch Forest. [USDA] General Technical Report RMRS-GTR-37.
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