Protocol Information

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Family Scientific Name:	**Sphagnaceae**
Family Common Name:	**Peat Moss Family**
Scientific Name:	***Sphagnum sp***
Common Name:	**Sphagnum Moss, Peat Moss**
Ecotype:	**Cumberland Gap NHP, KY**
General Distribution:	**The greatest diversity exists primarily in the northern hemisphere in peat bogs and moist tundra. Relatively few species are found in the Southern hemisphere in New Zealand, Tasmania, and southernmost Chile and Argentina.**
Known Invasiveness:	**None**
Propagation Goal:	**Plants**
Propagation Method:	**Vegetative**
Product Type:	**Container (plug)**
Stock Type:	**stem fragments**
Time To Grow:	**4 Months**
Target Specifications:	**14" x 20" trays with 4" of densely growing moss.**
Propagule Collection:	**Vegetative propagation is usually preferred as Sphagnum does not produce spores reliably or often and growth can be slow. Collected living plant fragments from upper 4 to 6 inches. We minimized the impact to the existing population by collecting only small (handful sized) samples from each thick hummock of moss and we spread out the collections over a wide area. We pushed the remaining moss back together to fill in the resulting holes to minimize evaporative moisture loss of remaining plants.**

Propagule Processing:	**Sphagnum is very sensitive to desiccation. We kept the sphagnum moist by placing the moss in plastic bags with no additional moisture. Bags were tied shut with only a slight amount of ventilation and kept out of direct sunlight.**
Pre-Planting Treatments:	**Living sphagnum moss fragments were sorted to remove plant debris and other living plants including other species of moss. Sphagnum fragments were kept long and were not chopped into smaller pieces. Fragments do not require rooting hormone or other treatment.**
Growing Area Preparation/ Annual Practices for Perennial Crops:	**A one inch layer of hydrated peat moss was placed into 14" x 20" x 4" Kadon trays with drain holes. These trays were placed into equal sized Kadon trays with no drainage holes to hold water and minimize watering demand. Water was added to the doubled trays to a level of one inch deep in the upper tray. Before use, the water was left to stand overnight to remove chlorine as sphagnum may be harmed by chlorinated water. These trays were allowed to sit overnight if the peat moss had not already been saturated enough to prevent floating. The sphagnum fragments were placed horizontally on the surface of the wet peat moss. About 25 fragments 2" to 4" long were placed in each tray. Either the lower ends of the fragments were pushed into the peat moss or an additional thin sprinkling of wet peat moss was added over the fragments and de-chlorinated water was watered over the trays to ensure good contact and moisture wicking with the wet peat moss.**
Establishment Phase:	**Trays were watered overhead with de-chlorinated water using a watering can. Water was maintained at a depth of ¼" to 1" in the upper trays. Trays were maintained in a greenhouse with daylength kept fairly constant, around 14 h. Natural daylength is augmented during the winter months by light supplied by 1000 watt sodium lamps. The greenhouse is covered with a whitewash solution that provides 30% sunlight shading from mid-April to October. Temperatures were maintained between 65 and 85 degrees F.**

Length of Establishment Phase:	**1 to 2 weeks**
Active Growth Phase:	**Fragments continue to grow from tips and branch at leaf axils.**
Length of Active Growth Phase:	**10 weeks**
Hardening Phase:	**trays of sphagnum were not hardened prior to outplanting.**
Harvesting, Storage and Shipping:	**Plants were transported to planting site in the upper growing trays without the lower water holding tray. Trays were wrapped in plastic to prevent drying and were kept out of direct sunlight.**
Outplanting performance on typical sites:	**Newly planted moss is vulnerable to drying and needs to have a water table within 40cm of the surface in peat lands or a moist microclimate. Research on establishing sphagnum moss for restoring cutover peatlands indicated that a moist microclimate provided by straw mulch and/or by living vascular plants is more important than access to a shallow water table for establishing sphagnum on bare peat (Grosvernier, 1995; Rochefort, 1997; Boudreau, 1998). Our planting site consisted of constructed vernal (seasonal) ponds that were clay lined to hold water that drained from a nearby forested hillside. The site is a fairly low lying area with a high water table and adjacent stream; however the ground water was cut off from the ponds by the clay liner. The clay substrate of the constructed vernal pools does not store or wick very much water. Sphagnum planted directly on this substrate would dry completely and perish during the driest part of the year. The substrate and hydrology of the vernal pools are completely different than that of peat bogs and therefore a specialized approach was needed. Positive results were obtained with test plantings utilizing peat moss for water storage as well as mulch, and living plants for shade and a moist microclimate. Test plantings consisted of 12" diameter 3' long peat moss filled tubes that were partially dug into the side of the pond. Tubes extended from the bottom of the pond to just above the highest water level. Intact mats of Sphagnum from whole trays were planted at the tops of each peat moss tube. To provide protection from desiccation a loose mulch layer of dried**

grasses and twigs was applied, and herbaceous wetland plants were transplanted into and around the sphagnum planting. The sphagnum thrived and a larger planting was planted the following year. A large containment area of approximately 100 cubic feet was constructed of black locust logs to contain a pie shaped area between a berm small island. The logs were placed to form a sloped wall from the bottom of the pool to above the high water line. The enclosed area was lined with natural burlap and filled with peat moss and rotted logs and allowed to hydrate over the fall and winter. Approximately 40 square feet of sphagnum planting substrate was created. Eight flats, each 2 square feet of 4 inch thick sphagnum moss were planted as whole mats without any spreading to avoid excess exposure to desiccation. The 16 square feet of sphagnum covered 40 percent of the containment area with 4 inches of sphagnum. Sphagnum mats were placed in scattered positions on the contained peat moss, watered, and lightly covered with dried grass leaves and small branches to provide a moist microclimate by shading and protecting from drying wind. The sphagnum moss survived its first season despite a severe drought and has continued to thrive, growing thicker and expanding its area.

References:

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Citation:

Ugiansky, Richard Jay. 2007. Propagation protocol for vegetative production of container *Sphagnum sp* plants (stem fragments); USDA NRCS - Beltsville National Plant Materials Center, Beltsville, Maryland. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 27 September 2007). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.