



Fern Propagation

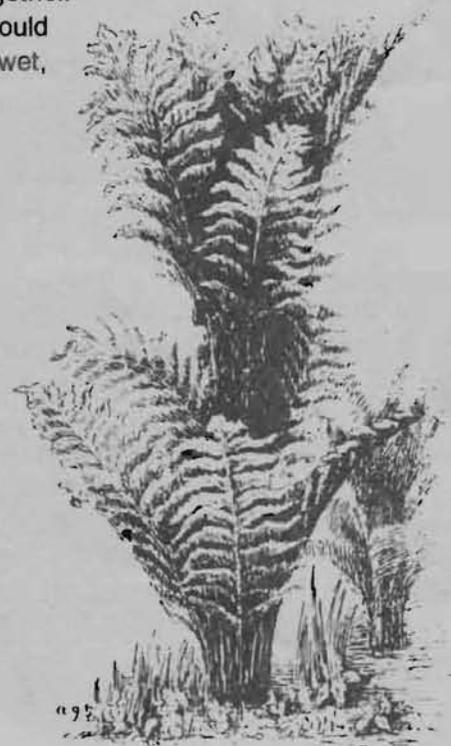
by Dr. Susan L. Hammen

Many species of fern that grow in the wild in Rhode Island take little care to cultivate and provide an interesting texture when mixed in a wild flower garden. Ferns may be propagated by spores or vegetatively. Propagation by spores can be done in the home or classroom and provide an inexpensive means to cultivate not only our native ferns, but also ferns from around the globe. A direct source of spores is a frond that has ripened sori, a cluster of sporangia or spore capsules. Mature sori color varies from light brown to gold to black; sori should look plump when examined with a hand lens. Pale dry or shriveled sori usually mean that the spores have been released although often many will still cling to the evacuated sporangia. Most Rhode Island ferns release their spores in mid to late summer.

To collect spores, remove a portion of the frond containing several sori. Place this material spore side down on a piece of clean, smooth, pale-colored paper and anchor another sheet on top of the material. Place in a dry spot away from any air currents for several days until the sporangia have opened and the dust-like spores can be seen. Tilt the paper to gently remove any debris (the spores should cling to the paper and remain behind). Most spores may then be stored in small envelopes or vials for months or even years (spores have been removed from herbaria sheets after 50 years and germinated). Spores containing chlorophyll, or green spores such as in *Onoclea sensibilis* (Sensitive Fern) or *Matteuccia struthiopteris* (Ostrich Fern, which is often grown commercially and eaten in the fiddlehead stage) should be sown immediately, although they may survive up to a year.

Spores may be sown on a mixture of 2/3 peat moss and 1/3 perlite or sand, or on pure vermiculite which has been homogenized in a blender for 1 minute to reduce the particle size. The medium should be placed in the oven at 350 °F for 1 hour to sterilize before use. Containers good for growing spores include petri dishes, plastic freezer containers or closet sweater or shoe boxes with tight covers to ensure a humid environment. All containers should be disinfected with a 10% chlorox solution. Fill the container 2/3 full with the medium and sow the spores on the surface. Spores may be placed in a disinfected spray bottle used for misting plants, with the spray diameter adjusted to a size slightly less than the container. This will disperse the spores evenly as they otherwise tend to cling together. Water for the spray bottle and that used in watering the plants should be distilled or boiled. The medium should be kept moist, but not wet, and containers should be kept at a temperature of 65-75 °F (18-24 °C) in an east or north facing window. The American Fern Society Exchange for 1990 lists 450 species and varieties of fern on hand. Packets of spores may be purchased for 25¢ by AFS members. Applications for membership in the AFS may be obtained from Dr. D.S. Barrington, Department of Botany, University of Vermont, Burlington, VT 15405.

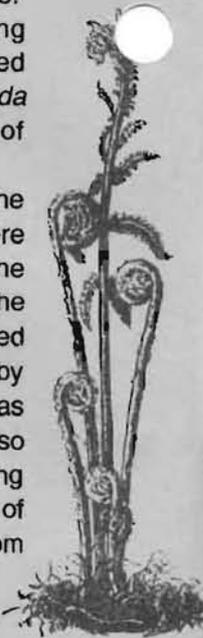
Germinating spores send out green filaments which expand into tiny green heart-shaped plants called prothalli. Sexual organs will be produced beneath these thin prothalli; fertilization usually occurs between 3 and 6 months. The new fern will be seen growing up through the notch in the heart-shaped body. When you observe several small leaves the small plants may be removed by carefully lifting them along with enough underlying media to preserve the young



roots. They should be transplanted to pots containing well-drained potting soil.

Most Rhode Island ferns reproduce vegetatively by means of underground stems called rhizomes. These rhizomes grow from several inches to several feet beneath the soil surface. This stem grows horizontally forward, branching frequently and decaying behind, leaving separate plants. Rhizome growth may be rapid, as in *Dennstaedtia punctilobula* (Hayscented Fern), which may become a nuisance in a small garden area. Other ferns such as *Osmunda cinnamomea* (Cinnamon Fern), have very slow rhizome growth and tend to form clumps of fronds, forming a good foliage accent in a wildflower garden.

When propagating ferns from divisions, rhizome sections should be removed from the forward growing tip. At least one healthy (undamaged) frond should be attached, and there should be roots observed beneath. In winter you should check for small green buds along the rhizome before removal. Always make sure that you leave enough rhizome intact to allow the parent plant to survive. Most Rhode Island ferns need a slightly acid soil which may be provided with superphosphate, mulched pine needles, or oak leaves. Soil acidity may be reduced by adding ground limestone, dolomite, or bonemeal for ferns requiring a more alkaline soil, such as *Asplenium platyneuron* (Ebony Spleenwort) or the walking fern, *Asplenium rhizophyllum*, so named from its habit of forming a new plant from roots formed at the tip of its long tapering leaves. Remember that while spores are produced in abundance (over 6 million on one frond of the Hayscented fern), ferns considered for vegetative propagation should be taken only from friends' gardens or from properties where you have obtained **written permission** to dig.



Some Rhode Island Ferns for Specific Habitats

Rich woodland

Fancy Fern (*Dryopteris intermedia*)

Spinulose Wood Fern (*Dryopteris spinulosa*)

Marginal Shield Fern (*Dryopteris marginalis*)

New York Fern (*Thelypteris noveboracensis*)

Christmas Fern (*Polystichum acrostichoides*)

Lady Fern (*Athyrium filix-femina*)

Rock Fern (Common Polypody) (*Polypodium virginianum*)

Rich woodland, basic soils

Maidenhair Fern (*Adiantum pedatum*)

Silvery Spleenwort (*Deparia acrostichoides*)

Ebony Spleenwort (*Asplenium platyneuron*)

Maidenhair Spleenwort (*Asplenium trichomanes*)

Broad Beech Fern (*Thelypteris hexagonoptera*)

Moist or Wet soils

Cinnamon Fern (*Osmunda cinnamomea*)

Interrupted Fern (*Osmunda claytoniana*)

Ostrich Fern (*Matteuccia struthiopteris*)

Royal Fern (*Osmunda regalis*)

Netted Chain Fern (*Woodwardia areolata*)

Marsh Fern (*Thelypteris palustris*)

Several species of ferns are lovely in the appropriate habitat, but may become aggressive in gardens. These include Hayscented Fern (*Dennstaedtia punctilobula*), Sensitive Fern (*Onoclea sensibilis*) and Bracken (*Pteridium aquilinum*), Virginia Chain Fern (*Woodwardia virginica*), Long Beech Fern (*Thelypteris phegopteris*).

For a complete list of Rhode Island's ferns and their Natural Heritage status, send 50¢ to the RIWPS office and ask for "Ferns and Fern Allies of Rhode Island".

References

Brooklyn Botanic Garden, 1983. Handbook on Ferns. Brooklyn Botanic Garden, Inc., NY.

Cobb, B. 1963. A Field Guide to the Ferns. Houghton Mifflin Co., Boston. (#10 of the Peterson Field Guides).

Foster, F.G. 1964. Ferns to Know and Grow. Hawthorn Books, Inc., NY.

Hoshizaki, B.J. 1979. Fern Growers Manual. Alfred A. Knopf, NY.

Lellinger, D.B. 1985. A Field Manual of the Ferns and Fern-Allies of the United States and Canada.

Smithsonian Institution Press, Washington, D.C.

Mickel, J. T. 1979. How to Know the Ferns and Fern Allies. Wm. C. Brown Co., Dubuque, Iowa.

Mickel, J. T. with E. Fiore. 1979. The Home Gardener's Book of Ferns. Hold, Rinehart and Winston, NY.

Phillips, H.R. 1985. Growing and Propagating Wild Flowers University of N. C. Press, Chapel Hill, NC.