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# Growing Ferns

## Classification

There are about 12,000 different species of ferns comprising about 280 genera and 35 families. The ferns belong to the division Pterophyta, the true ferns, and along with their spore-bearing relatives make up a group known as the Pteridophytes. The Pteridophytes, like the conifers, cycads and Angiosperms (flowering plants), have true roots, stems and leaves, with special water and food conducting tissue (vascular tissue).

## Morphology

The roots of ferns are very fibrous and the stem confined to a sub-surface or surface paralleling rhizome from which the fronds rise directly. The ferns have no flowers or seeds; instead, reproduction is by spores. Ferns are one of the oldest groups of plant on the face of the earth, with fossil records being found in 225 million-year-old Paleozoic rock strata.

## Distribution

Ferns are found all over the world, even the Arctic, but their love of a shady humid growing environment means that they are found most abundantly in the warmer temperate and humid tropic regions. At no time do they appear more at home than when growing in a rock crevice alongside a stream, waterfall, or pool.

## Horticultural Groups

Ferns can properly be grouped into three categories: the hardy, half-hardy and tender ferns. Hardy ferns are those which can withstand a temperate climate winter with moderate protection. The half-hardy ferns are generally grown in a conservatory or greenhouse which is unheated in the summer and kept just the warm side of frost danger at 40°F during the winter. The plants must be shaded from direct sunlight and syringed daily to maintain a moist atmosphere. Tender or hothouse ferns enjoy similar summer conditions, but need a warmer winter temperature of 60°F. All greenhouse ferns enjoy a period of semi-dormancy with less water than normal (but not complete dryness) and a cooler temperature. Adequate ventilation is always important. Alternatively, potted greenhouse ferns may be set into outdoor shaded summer borders.

## Potting and Planting

An ideal potting or planting mix for ferns is equal parts of loam, leaf mold, peat and coarse, well-washed sand. For potted ferns, a handful of charcoal chips in each pot will help keep the soil sweet. Hardy ferns are generally planted in the fall and top-dressed annually in the spring with peat moss and leaf mold. Most potting and repotting of ferns in the greenhouse is done in spring. A pot just large enough to contain the fern without disturbing the root system is ideal.

## Propagation

Ferns are propagated by division, off-shoots and spores. Division is done in spring just as new growth starts to swell. To divide creeping type ferns, simply cut off a piece of the rhizome with a few fronds and buds and pot it up separately. Some ferns, like *Dryopteris* spp. or shield ferns, occasionally produce little plantlets on their fronds. Peg these down into pots or boxes of fine compost and sever them after rooting.

The most challenging, yet not difficult, way of propagating ferns is by spores. Spores are borne in special spore cases called *sporangia*. These sporangia are grouped into *sori*. Each sorus is usually covered with a special shielding growth called the *indusium*. The taxonomist uses the distribution and characteristics of these sori to identify ferns. The homeowner often confuses the sori with scale insects, but their regular placement on the leaflets identifies them as sori, while scale insects usually settle on the midrib of the leaf.

When the spores are mature the sporangia burst and spores are cast out to germinate. By taking a mature frond with ripe sporangia and placing it in an envelope, a grower may collect the spores released as the frond dries. The spores are sown on the surface of a sandy, sterile medium underlaid with bits of crockery in a shallow bulb pan. Place the bulb pan in a

shallow tray of water and cover with glass or polyethylene. Shade the bulb pan. Autumn sowing is best, but the spores may be saved until spring.

When spores germinate they form a tiny, very thin, heart-shaped plant body called a *prothallis*. This is the generation which produces sperm and eggs. The union of these sex cells produces an embryo which grows into the typical fern generation, one which will eventually become mature and produce more spores. Once the spores have germinated, place the prothallia in a flat of fine leafmold at a 1 x 1 inch spacing. Be sure the atmosphere is moist. Soon you will see a tiny leaf growing up from the prothallus. When the young ferns are large enough to handle, plant them in very small pots.

## **Pests**

The primary pests of ferns are white fly, scale insects, and root-feeding mealy bugs. Control of these pests on ferns is difficult, as conventional sprays cannot be used for fear of damaging the foliage. We suggest a granular form of systemic insecticide applied to the soil surface for control of these insects. Follow label directions precisely.

## **Ferns to Grow**

### *Hardy ferns*

Asplenium trichomanes (Spleen wort)  
Dryopteris spp. (Wood fern, Shield fern)  
Phyllitis spp.  
Polypodium spp. (Polypody)  
Polystichum spp. (Christmas fern, Sword fern)

### *Hardy ferns for a cold greenhouse*

Adiantum pedatum  
Asplenium spp. (Spleenwort)  
Athyrium spp. (Lady fern)  
Cystopteris spp. (Bladder fern)  
Dryopteris spp. (Wood fern, Shield fern)  
Hymenophyllum tundridgense (Filmy fern)  
Osmunda regalis (Royal fern)  
Polypodium (Polypody)

### *Ferns for houseplants*

Cyrtomium falcatum (Holly fern)  
Phyllitis scolopendrium (Hart's tongue fern)  
Platycerium bifurcatum (Stag's horn fern)  
Pteris cretica  
Pteris multifida

### *Tender ferns*

Adiantum spp. (Maidenhair fern)  
Asplenium spp. (Spleenwort)  
Blechnum spp. (Deer fern)  
Cyathea spp. (Tree fern)  
Davalla spp. (Hare's foot fern)  
Dicksonia spp. (Tree fern)  
Lygodium spp. (Climbing fern)  
Nephrolepis spp. (Boston fern)  
Notholaena spp. (Lace fern)  
Platycerium spp. (Stag's Horn fern)  
Polypodium spp. (Polypody)  
Pteris spp. (Brake fern)  
Trichomanes radicans (Killarney fern)  
Woodwardia radicans

### *Native New Hampshire ferns suitable for transplanting to a home garden*

Adiantum pedatum (Maidenhair fern)  
Dryopteris spp. (Wood fern, Shield fern)  
Matteuccia pensylvanica (Ostrich fern)  
Onoclea sensibilis (Sensitive fern)  
Osmunda regalis (Royal fern)  
Osmunda cinnamomea (Cinnamon fern)  
Polypodium virginianum (Rock Polypody)  
Polystichum acrostichoides (Christmas fern)

*original fact sheet by Charles H. Williams, UNH Extension Ornamentals Specialist, edited, reformatted 3/01*

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