

ASPECTS OF FERN PROPAGATION

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The most general plan of propagation of ferns is by spores but with many species it is difficult and with some it seems impossible. In a country where ferns form a dominant part of the vegetation and the range of species is considerable there is often little inducement to plant propagators to widen the range of ferns available. Many private citizens and too often nurserymen also 'raid the bush' to obtain stocks of ferns — their method of propagation in this case is roots or rhizomes dug bodily from the soil. Too often this ends in tragedy with the whole fern dying. Exotic species and cultivars are often propagated asexually from the divisions or rhizomes from the nurseryman's own stocks.

The purpose of this paper is, very briefly, to discuss the success we have had here at the University of Waikato with the propagation of ferns from spores.

The fern species we have tried are chiefly exotic, many of them subtropical. Although more elaborate techniques have been tried we have finally settled on this method for all our propagation. It is simple, and when carried out with cleanliness and punctuality on receipt of the spores the rate of success is very high.

Briefly, before I describe the technique, I will remind you of the stages in the fern life-cycle so as to refresh your memories.

1. Sporophyte generation
- 2., 3. The sori distributed along the sporophyll
4. Indusium and receptacle
5. Sporangium
6. Spore
7. Gametophyte generation — prothallis
8. Antheridia
9. Archegonia
10. Sporophyte generation emerging from prothallis.

The spore is generally received either as a brown powder or attached to a remnant of the sporophyll. The packets containing the spore are separated out immediately and kept in such a way as to reduce risks of contamination. All the labelling and recording is carried out at this stage without anyone opening the packets.

Ordinary 2-liter glass jars are taken and thoroughly washed and sterilized in dry air beginning at 450°F and running down overnight to a handling temperature by morning. At the same

time trays of teased sphagnum moss are given the same very high temperature treatment.

In the morning the moss is added to the jars and watered with de-ionised rainwater so that the level of wet moss is just below halfway up the jar. The water is kept to a level just below the surface of the moss.

At this stage the spore is tipped over the surface of the moss and previously hot water sterilized vacuum seals are slipped on. The seals are held firmly and need to be kept down and untouched for about 10 days. The whole jar is partly submerged in the propagating pit for the development stage of the prothalli at a temperature of 75° F. Sterilized water may be added carefully if the jars dry down.

By about 10 days the first signs of life will appear — the moss will show a green staining to be followed by a haze of little green dots. These grow at a variety of rates into the prothalli which can be allowed to become quite tightly packed. They are then very carefully moved out into trays of sieved sphagnum, kept in moist heat for two weeks and then taken out of heat as the first few fronds appear. From then on they will steadily grow to become sizeable plants in twelve months; many will in fact bear sori by that time.

F. SCHUURMAN: What length of time is needed from spore sowing until a commercial grade of plant is obtained?

R. LYCETTE: A lot will depend upon the growing medium and environment but 12 months should provide a good-sized plant.

COMMENT: We are getting very good germination of many species using this method but I have no idea how much it is due to the spore being fresh and the easiness of different species to grow.

A. PALMER: What effect does light have on germination?

R. LYCETTE: Diffused light is available in the house and reduced even more by the container's lid and the embedding of the jar in the soil.

P. BATES: What mixture do you pot-on into?

R. LYCETTE: We place them initially in sieved sphagnum moss and 'flood in' clay and leafmould over a period of time, increasing the heaviness of the medium gradually.

To carry this one stage further, for our specialist purposes it is our practice to place horizons in the pot — clay below the potting medium. This has been based on the recognition that ferns usually grow in a layer of humus-rich soil over clay.