

OBSERVATIONS, SELECTIONS, AND PROPAGATION OF NEW ZEALAND FERNS

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Where the copse wood is the greenest,
Where the fountain glistens sheenest,
Where the morning dew lies longest,
There the lady fern grows strongest.
Sir Walter Scott.

New Zealand ferns and their history. New Zealand is a country of ferns. We have acres and acres of ferns, lofty, graceful tree ferns, hanging ferns, climbing ferns, pellucid filmy ferns, and terrestrial ferns carpeting forest floors, and miles and miles of roadsides lined with *Blechnum*. There were no browsing animals in New Zealand before the arrival of man and our climate is conducive to the growth of ferns.

Ferns such as *Marattia salicina* (king fern) were cultivated in plots by the Maoris and their starchy rhizomes were used to provide food, while some ferns were collected and used for medicinal purposes; the unfurling croziers of *Cyathea medullaris* were used to sustain warriors and hunters alike. Everywhere cut fronds have been used for decoration and ferns have been immortalised in carvings.

Some reasons why more of our ferns do not appear in the majority of garden centres are the lack of knowledge of the existence of the great range of ferns available in New Zealand, the hesitancy with which newly introduced products are approached, and the understandable ignorance of conditions necessary to grow ferns successfully.

They are a rewarding plant to grow, have tremendous aesthetic appeal, and there is a range of proven, reliable, and easily propagated ferns available.

Observations and experiences with propagation. It can be argued that all plants can be propagated, but considerable difficulty has been experienced trying to propagate our native ferns in sufficient commercial quantities. To date I have been unable to locate much literature on fern cultivation in New Zealand, so the task for me has been to try and understand our many and varied climatic and soil conditions to facilitate greater understanding of different fern growth habits.

I do not claim to have all the answers but I can share with you some of my observations and experiences of the last five years of fern propagation. Spore planting is the method favoured because it

is cheap, fairly quick, and reliable. I do use vegetative propagation with *Asplenium bulbiferum* because plantlets are ready made and easily available. Spore is collected off selected mother plants either from my own garden or from the bush.

The mother plants are selected for two reasons: one, proven viability of spore, and two, strong luxuriant growth and foliage.

Repeated trials with spore have shown me that spore collected on humid days tends to have a higher failure rate, usually because of fungal infections. Likewise, spore collected from fronds on roadsides and bush verges, are usually heavily contaminated with dust and are very hard to get satisfactorily clean. Day, date, and weather are always noted at the time of collection.

The fresher the spore, the higher the success rate with germination, the quicker the germination, and the lesser the chances of fungi, mosses, and liverworts overcoming the developing prothalli.

I have successfully germinated spore on clay or earthenware pots, bricks, sphagnum moss and, in fact, anything that will allow the retention of moisture without stagnancy occurring.

The preferred mixes are bark-peat, bark-sphagnum moss or straight bark, depending on the spore about to be planted. The mix is prepared by pouring boiling water through it and then leaving it to cool for a couple of hours. Then spores are shaken over the surface, the tray is labelled and sealed in a plastic bag.

Signs of germination are usually evident in two to three weeks and the prothalli of most fern species are well developed (if not too thickly planted) in about five months. If too thickly planted they are moved on in small clumps to another tray and, by reducing the light and watering heavily, stress is decreased while they become established again, usually after about three weeks. Watering is important when the prothalli are mature because fertilization takes place in the presence of water. However, with too much water the prothalli lose condition and become soggy looking; with too little water fertilization takes place very slowly or not at all.

Watering can vary from every few hours for filmy ferns to only twice a week for *Dicksonias*.

At the same time, light levels and heat seem to play an important part in successful fertilization, so light is increased as fertilization increases in the trays. Heat on the other hand, is lowered accordingly. When the sporophyte or young fern emerges the production of the anchor root is stimulated followed by the adventitious roots. The continuing growth of the young fern inhibits further development of the prothalli and it gradually withers away at this stage with the breakdown of tissue. *Botrytis* moulds can be a problem so that captan spray is used as necessary with some success.

Plants are hardened off and then left to develop until they are

ready to be tubed.

Tubed plants are generally problem-free, although some ferns such as *Blechnum* and *Cyathea* are prone to wilting.

Hot, humid weather seems to cause excessive sweating on some types of ferns; however humidity must be maintained so it becomes almost a "Catch 22" situation.

New Zealand ferns are generally not bothered by many insect pests. However, systemic insecticides can be used for slugs, aphids, white fly, and scales with some success. Fungus gnat larvae can be a nuisance in trays of prothalli and here, Diazinon is a fairly effective control.

Selection of lesser known species. Some of New Zealand's ferns are real collectors' items.

Leptopteris superba (Prince of Wales fern) is acknowledged as one of the world's most beautiful ferns. It is a filmy fern, which in its natural habitat requires high rainfall, high humidity and low light. Its application in an ordinary garden situation is unimaginable.

Asplenium haurakense is a charming, little-known fern with tough fronds. It requires less humid conditions and is an undemanding pot plant.

Asplenium shuttleworthianum is a fairly rare fern found naturally on the Kermadec Islands. It is a hardy species which makes quite an unusual, spectacular pot plant.

Dicksonia lanata is little known and rarely cultivated. It is fairly difficult to raise from spore, but is well worth the effort, growing slowly to a height of about 1½ metres. It is an excellent tree fern for smaller gardens and pot culture.

Polystichum richardii, the shore shield fern, is ideal for coastal gardens. It has tough, leathery fronds and will withstand a high level of sunlight. It also does well indoors where it rewards with dark-green, glossy foliage.

The cultivars available for garden situations and indoor culture have, so far not been explored to any great extent in New Zealand.

CONCLUSIONS

I wish to stress from my observations, that no two fern species seem to require the same growing conditions and post-fertilization care. However, limited success can be achieved by following specifically laid growing principles and further understanding can only be achieved through observation and perseverance. It is both a rewarding and frustrating experience to cultivate ferns as, each year, I add new facts and discount others. The more I learn, the more I realize there is to learn.