

A SIMPLE CONTROLLED ENVIRONMENT FOR SPORE CULTURE

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I don't wish to go into details of spore culture because every fern grower will have his own method, but everyone will also have experienced, to a greater or lesser extent, losses due to environmental fluctuations. From my experience I have devised a completely self-contained, controlled environment which ensured consistent and favourable results.

The "Contraption" as I call it, is made entirely from glass and resembles a miniature glass house. A conventional 150 watt aquarium heater and thermostat provide the heat and control. The size is determined by the dimension of the trays used. My unit is designed to accommodate two plastic seed trays and is constructed from 1/4 inch plate glass, the front being 10 inches high, back 15 inches high, by 40 inches long and 14 inches wide. The glass should be bought cut to size and glued together to form a tank. Small pieces of glass are glued to the middle of the bottom to form a cradle on which the heater is horizontally placed. A half-inch hole should be made in the top of the rear panel for the power cable leads. The glass cover should be in two or three pieces to facilitate easy access.

Having gone this far you can probably guess how the "Contraption" works, but before progressing further I would recommend sterilizing with Janola or salt. Sterilized clay pots are used as stands for the seed trays, plastic pots being unsuitable as they have the tendency to float around before one can place the trays. Sufficient water should be added to just cover the pots so that the trays are not in direct contact with the water. The thermostat is suspended just under the hole but well clear of the water. Condensation does not matter. The temperature will be determined by the particular culture. I have found New Zealand native ferns require 15 to 18°C while *Adiantum*, etc., do best slightly warmer, 18 to 24°C.

To start the culture I cover the "Contraption" completely with black polythene and, at the first sign of green on the medium, change the black for opaque polythene, and often also add a sheet of newspaper. As the first fronds appear, air should be given by lifting the cover a little at a time, increasing the amount slowly. The growth can be further stimulated by the use of Grow-Lux fluorescent tubes. From the onset it is impera-

tive that the strictest hygiene be maintained throughout and the water level be checked for evaporation.

After the prothalli have developed, fertilization takes place; this is the most critical period in the first stage of developing sporophytes. High humidity is essential for distribution of the sperms. The advantage of this system is that separate units can be easily constructed to provide individual environments which are essential because ferns have differing germination periods.

GRAFTING TECHNIQUES

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As there are innumerable methods of grafting and each person has his (her) own preference, I will limit myself to the ones that I have used with some success.

Side Graft. We use this method to graft *Cedrus atlantica* onto *C. deodora* stock, also some hibiscus cultivars onto more vigorous stocks.

Prior to grafting, the rootstock plants are moved into the glasshouse to promote growth, usually up to 10 days before grafting. At the time of grafting, lower branches and side shoots are trimmed off and an oblique cut is made in the stock at an angle of 20 to 30°, up to an inch (25 mm) long.

The scion wood is cut into a wedge at the basal end, these cuts being made as smooth as possible. The scion is inserted into the stock while pulling the upper part of the stock backward, ensuring contact between the cambium layers. Once the top of the stock is released the scion should be held firm by the pressure from the stock. Then it is relatively easy to tie with raffia or rubber ties. The cut surfaces are then sealed with grafting wax, and placed in the area where they are to remain while the union heals. Once callusing of the wound is well progressed the stock plant is cut back by half of the amount that is above the graft. Then, once the grafts are well callused and prior to moving outside, they are cut right back to above the graft.