

GROWING FERNS FROM SPORES

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As well as being attractive plants for the garden or potted in the house, ferns have an unusual life cycle which makes them fascinating to grow from scratch. Unlike flowering plants, which produce seeds from which new plants grow directly, ferns produce spores which germinate to produce an intermediate gametophyte generation, known as the prothallus. These are effectively tiny, and usually short lived, independent plants which, given the right conditions, produce eggs and sperm which fertilize to produce the sporophyte generation – the large fern which we see in the wild. Interestingly some ferns, like Killarney Fern *Trichomanes speciosum* can live solely as a gametophyte, only rarely producing the sporophyte fronds.

First find your spores. The large fern fronds we are all familiar with produce their spores on the underside of the leaf pinnae in sporangia (Fig. 1). The spores usually ripen in late summer, they become dark-coloured and the sporangia open to release them. Collection is easy – just take two or three pinnae off the fern frond and put them in a paper packet. Leave overnight somewhere warm and dry and in the morning you will see that they have shed a fine blackish dust which is the spores.



Fig. 1

Sporangia on the underside of a fern frond

Plant your spores. To germinate and grow into prothalli the spores need moisture and light. I put a thin layer of well-moistened potting compost in a jar and thinly sprinkle the spores over it – the spores are very fine and light. Pick up a little of the “dust” on the end of a knife to do this. Screw the lid onto your jar – this will keep the moisture in, any evaporation will condense and run back down the sides of the jar. Don't forget to label and date your jar (Fig. 2). The prothalli cannot take direct sunlight so put your pot on a north-facing windowsill where it can get plenty of light and leave. It can take several weeks or even months for the spores to germinate.



Fig. 2

Jar ready for the spores.

Grow the prothalli. Eventually as the spores germinate you will see a film of green spread over the potting compost. The germinated spores will grow into little filmy plates of tissue 1 or two cells thick – the prothalli, Fig. 3.



Fig. 3

Growing prothalli

Fertilization. The well-grown prothalli will produce male and female reproductive organs, typically on their underside. The male organs will release sperm which will swim through the moisture in the pot to fertilize the eggs in the female organs. The fertilized egg will grow into an immature sporophyte, Fig. 4. Typically you will get several to a pot.

Fig. 4

Immature sporophyte



Prick out your sporophyte. Once the sporophytes get big enough to handle they will need to be pricked out into a pot to grow on. Fill a small pot with well-moistened potting compost and remove three or four sporophytes from your jar – a pair of forceps is best for this – and plant in the compost. The sporophytes are still quite fragile and need to be kept on a north facing windowsill and sprayed with water regularly to keep moist, Fig. 5.

Fig. 5

Pricked out sporophytes.



Enjoy your plants. When your ferns have grown to a reasonable size, some will probably die as well, plant out into a large pot and allow to grow. Split and repot the plants if they get too big. Native plants will grow well in your garden. The plants in Fig. 6 are around five years old.

Fig. 6. *Dryopteris x complexa* from spores.

