

**GERMINATION OF SEEDS OF SOME PLANTS ON
STEPHENS ISLAND, COOK STRAIT
NOVEMBER 1992 TO MARCH 1993**

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Part of the management of Stephens Island involves the propagation of thousands of coastal trees and shrubs to revegetate pasture to coastal forest. The two main forest patches that remain on the island cover only about 5 ha (formerly nearer to 100 ha). The nursery is within the bush near the lighthouse and the glasshouse is tucked into the trees to avoid the gale force winds that batter the island for at least several days each month. Unfortunately this results in low levels of direct sunlight in the house, with none at all for three months in winter. For the rest of the year the glasshouse can raise temperatures by up to 10°C but seldom more than 5°C; in early spring it is often cooler inside than out. As the island is distant from land, influenced by cool ocean currents, and subject to frequent strong wind there is a narrow temperature range (3°C - 21.5°C in 1993; the daily range usually under 6°C). During spring extended periods of fog can cause problems in the glasshouse through damping off.

Seeds collected fresh were stored in a refrigerator until sown. The fridge is powered by a diesel generator that runs for 5-6 hours at night with a daily temperature range in the fridge of up to 10°C. Seeds were sown in trays of potting mix and covered with a depth of mix equal to the thickness of the seeds. Fine seeds had peat sieved over them to hold them in place.

Myoporum laetum (ngaio). At least 50% of the plants grown were of this species. Seeds collected in summer were stored dry in the fridge and sown in August. Seedling emergence began after 6 weeks, with a main flush after 8 weeks. Seeds continue to germinate in reasonable numbers into the following winter with a few in the following spring. The optimum time for transplanting (to root-trainers) is between the first appearance of true leaves and the appearance of the 2nd set of true leaves. Most of the hard 'stones' contain 3-4 seeds (embryos sit in four elongated 'pockets' in each 'stone', the hard walls of which appear to be endocarp/test Ed.). On germination, the root pushes through at the apex, leaving a small c. 1 mm diameter hole. The cotyledons are usually drawn out of the stone, although occasionally the cotyledons appear to swell before emerging and lift the stone out of the soil.

I am somewhat intrigued (and frustrated) by the way only one seed will germinate at a time. Cold stratification had no effect (scarification of the 'stones' had no effect on germination rate in trials of Banks Peninsula *Myoporum* seeds by me. Ed.).

Cordyline australis, cabbage tree. The greatest difficulty has been beating the geckos to the fruit. Seeds collected in April were sown immediately. About 20% of what had appeared to be viable seeds germinated in September. Seedlings did not appreciate pricking out, only the larger (6 month) seedlings surviving.

Pittosporum tenuifolium (kohuhu). Seeds collected in April/May were stored in moist sand in the fridge and planted in July. Seedlings appeared in nine weeks germinating over a short period with what appeared to be almost 100% germination. Surplus seeds held in the fridge germinated in the fridge in November.

Melicope ternata (wharangi). Seeds collected in early May '93 were sown immediately. Initial germination occurred at the end of November but only where other plants (zucchini) gave full shade to the tray. Abrasive and hot water scarification was also attempted, with no difference (hot water killed the seeds). The previous season trays were not shaded at all. Germination occurred in March when the sun's angle had declined enough to fully shade that part of the greenhouse.

Coprosma repens (taupata). Seeds collected in April were stored dry in the fridge and sown at various times to stagger pricking out. About 95% of viable seeds germinated after 6 weeks with a few earlier and later (up to nine weeks from sowing). This appeared to be consistent regardless of the month sown (August to December).

Olearia solandri. Seeds were stored dry for up to six weeks at room temperature then most were mixed with sand and stored for four weeks in the fridge. This was too long, two weeks stratification being sufficient (otherwise they germinated in the fridge). Seeds sown direct had a lower germination rate and less even germination. Roots are very fine so seedlings were allowed to grow to 2-4 cm before pricking out.

Cassinia leptophylla (tauhinu) behaved similarly to *O. solandri* although a four week stratification was not too long.

Myrsine australis (mapou) and *Melicytus* (*Hymenanthera*) *obovatus* (whare-karara) seeds were difficult to germinate, although cracking *Myrsine* seeds seemed to help. I have no quantitative information for them.

In the glasshouse and shadehouse on Stephens Island tree wetas are particularly partial to ngaio and taupata seedlings, one large weta accounting for over 100 seedlings in a single night. They also eat the occasional *Cassinia* and *Olearia* seedling but don't touch mahoe (*Melicytus ramiflorus*), kohuhu or mapou. Tree wetas have been observed to be reluctant to forage on the ground where large predators are present, but are seen in large numbers on the ground where predators are absent.