
SEED GERMINATION FORUM

PANEL MEMBERS: Lindsay Hatch, Eric Appleton, and Graham Milligan

Each member of the panel gave a presentation followed by discussion.

Preparing, Patience, and Persistence in Seed

Lindsay Hatch

Joy Plants, Runciman Rd, RD2, Pukekohe East

PREPARATION FOR SUCCESSFUL SEED COLLECTION IS IMPORTANT

This is the beginning of useful or useless seed propagation. There are several methods of collecting your seed. Some devised are simple and effective, others slow and cumbersome. Collection by hand is the most common practice, but not necessarily the best. It is very time consuming, and the seed is not always ripe, therefore time is wasted. This is also a common occurrence from kind old ladies who come into our nursery. We find that two of the most effective ways of collecting seed is the use of net bags, which are placed over seed heads and the laying down of shade cloth catch sheets. Net bags are most effective in collecting seed from plants which have spring-loaded seed capsules, such as *Geranium*, or plants that have fruits that are desirable to birds and animals. By using net bags, seed can be left to ripen completely and are easy to pick with no waste. Catch sheets are best when collecting off large trees, such as *Podocarpus*, *Dacrydium*, and *Dysoxylum* (kokehoke). The use of shade cloth means that moisture does not collect on top of the cloth and plants are not killed off underneath while the cloth is in place.

PREPARATION FOR SEED STORAGE OR SOWING

Once seed has been collected it is essential that seed is clean for good storage and germination. There are several cleaning methods, which can be used for the many seed types. Some of the various methods we have used are listed below.

Fuel and Pounder. For seed such as *Pittosporum*, when seed capsules can be quite hard to remove due to their sticky covering.

Decomposing in Water. For seed in pulp such as *Coprosma*, and other such seed, is left for several days or weeks in water. The washing is also very effective for cleaning and removal of nonviable seed.

Winnowing. For seed that has been dehusked, or has high dust, or light nonviable seed. It can be used for many seeds such as most bulb seeds. A vibrating conveyor and fan system can be a very effective winnowing system.

Sieves. Are most useful for cleaning many seeds. Either sieving out rubbish bracts or capsules, and other undesirables from your seed can do this.

An Old Washing Board. This has proven a most effective way to clean grass seed. By rubbing seed heads on the board, the small seeds are removed from their sheath.

Birds. This has been most effective when you can find roost sites.

Once seed is clean, it should be either ready for storage or sowing.

If storing, place in the appropriate storage package, with the name and date when collected. Most seed can be stored in paper bags in a cool dry room, but certain seed may need to be stored in a moist container of sand or moss in the fridge.

If sowing your seed is the next intended step, it may need other treatments before sowing to aid in germination. To break a seed's inhibitors, various methods of scarification or stratification are used in this process. Some of the more usual and uncommon methods are listed below.

Scarification. The abrasion or chemical treatment of a seed's coat in order to help speed up water intake and induce germination.

Stratification. The storage of seed, either in warm or cold conditions, to overcome dormancy and assist germination.

Filtration. Is a method very rarely used but can assist in germination of a number of seeds. *Sandersonia* seem to respond to the simple method of being placed in a net bag in a toilet cistern where water is continually flushing the seed, and then replaced, removing the seed's inhibitors. Another method of this is placing bagged seed in a stream.

Smoking. This can be done in various ways. The purchase of various smoke products on the market and application as directed. A less expensive method is creating your own smoke using a smoker or sieve. When selecting material for your fire to produce smoke try and find materials similar to that of the area from which the seed has come. For Australian seed, use material like *Banksia*, *Hakea*, *Leptospermum*, and *Eucalyptus*. For African seed, use Proteaceae, *Acacia*, *Senna* [syn. *Cassia*], and various rushes. When using a sieve to smoke seed, light your material and smother so that it smoulders and produces smoke, but not heat, and smoke seed for several minutes. When using a smoker, seed is sown in its growing container and placed in the smoker. Make sure the smoker does not get too hot burning or melting your growing container. Once finished, water and wait.

PATIENCE FOR SEED SOWING AND GERMINATION

Most seed may be relatively fast growing but some may have long time lapses before germination that can not be broken. The sign of a good propagator is one with patience, which we must have. Since, as in one or more cases, we have had seed for 3 or more years after sowing before germination. Miro (*Prumnopitys ferruginea* [syn. *Podocarpus ferrugineus*]) is a perfect example of this. When sowing seed think how it grows in the wild situation and try to simulate this situation. Do not go by the textbook situation every time, it is not always right. Too often you see seed sown in trays that looks like a roller has been over it then seed sown and covered. When germination takes place, the roots can not penetrate the soil. When we fill containers the mix is placed in the container and given a light tamp to firm the soil. The seed is then sown and covered, if needed, with pumice sand, and watered. In many cases trays are then placed under trees and left to germinate naturally. Some is germinated on a hot bed or under frost cloth. Ninety percent of our seed is grown this way with high success.

PERSISTENCE

If at first you don't succeed, try try again. There is much to learn about growing plants from seed. Trial and error is common practice; so if you don't try you will not learn; and if you don't learn you can't teach and if you don't teach you're not carrying out the I.P.P.S. motto.

Seed Treatment of New Zealand *Sophora* Species With Concentrated Sulphuric Acid To Hasten Germination

Eric J. Appleton

Appletons Tree Nursery Ltd, 1748 Main Road South, Wakefield, Nelson

INTRODUCTION

Sophora microphylla and *Sophora tetraptera* are small trees with attractive yellow flowers in spring. Their mature seeds have hard yellow seed coats, which must be scarified to allow the entrance of moisture before germination can begin. Unscarified seed can lie in the soil for many years without germinating. If only a few seedlings are needed the hard coat can be cut with secateurs or a sharp knife at the end farthest from the micropyle. Soaking in water for 24 h will swell the seed to twice its size and it can be sown.

SULPHURIC ACID TREATMENT

If larger quantities of plants are required, consistently good results have been achieved by soaking dry seed in 96% commercial grade sulphuric acid initially for 1 h. Full protective clothing is advisable to protect skin, eyes, and clothing from accidental acid spillage. Use glass jars to hold the seed and pour the acid carefully over the seed, which will rise in the jar. Stir regularly with a glass or wooden rod to avoid the seed setting in a solid lump. Time the treatment carefully. If red blotches appear on the seed coat remove from the acid. When 60 min has passed pour the seed and acid into a stainless steel kitchen sieve held by a plastic funnel over a heavy-duty plastic container clearly labelled "Used Acid". The acid can be re-used several times even though it is now black. Thoroughly rinse the seed in the sieve with running water, collecting the diluted acid-rinse in a plastic container for disposal. The seed is now soaked in clean water for 48 h. Some or most of the seed will swell and must be separated from the nonswollen seed.

The South African technique of using a sugar solution to separate germinating from non-germinating *Eucalyptus* seed may have application here. Non swollen seed must be redried before re-treating with acid. Seedlots vary considerably in the total time needed in acid to achieve close to 100% germination. Usually a 30-min acid treatment is used as a second treatment if the majority swelled after the first 60-min treatment.

Trials with boiling water or near boiling water poured on to *Sophora* seed have given variable results, whereas acid treatment has given consistently good results.