

The third New Zealand species *Sophora* 'Little Baby' [syn. *S. prostrata*] has a brown or black seedcoat that appears softer. A warm water soak may be sufficient to swell the seed; only if this fails should acid be tried for a short period. Trials continue.

### TAKE CARE

- Never add water to acid; it will react violently and splash acid out of the container.
- Never add acid to damp seed; the seed will get very hot and cook.
- Never put acid in metal containers; it is highly corrosive.
- Always wash acid off clothes or skin immediately.

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## Seed Collection, Treatment, and Storage

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### INTRODUCTION

When a packet of seed arrives on your desk, it is to all intents and purposes dead. It doesn't appear to move, grow or breathe. Unfortunately it sometimes is dead on arrival (DOA). Most species of plants flower and once pollinated, develop into seed. Once seed is shed it goes through a period of conditioning that allows it to germinate when conditions are near optimum so as to ensure maximum survival. In most cases this conditioning involves removal of chemical inhibitors surrounding or within the seed coat. These inhibitors are removed by; washing (rain), acid drench (bird and animal digestive system), temperature (stratifying), light, fungal, or a combination of the above.

We are fortunate that by collecting and storing seed we are able to hold seed in a relatively dormant state until we germinate. To do this we need to understand and apply the methodology needed to break down the chemical inhibitors. Substitutions for natural conditionings can be used to facilitate ease of germination. These include:

- 1) Washing in clean water — often several times over a period of days. (This is why I recommend overhead watering of the seed trays rather than capillary watering).
- 2) Adding a few drops of household detergent or a few drops of lemon juice to enhance cleaning.
- 3) Washing in a "cola"-based soft drink.
- 4) Stratifying by utilising a refrigerator.
- 5) Exposing the seed to light whilst in the seed tray.

My job as a seed collector/supplier is to ensure seed isn't DOA. To do this one must have a basic understanding of the seed. This differs between species and often within species (provenance).

## COLLECTION AND STORAGE

From a practical perspective, I find observation and understanding of what happens after seed shed can greatly assist germination techniques, for example:

- 1) Birds eat the drupes from miro (*Prumnopitys ferruginea* [syn. *Podocarpus ferrugineus*]) and matai (*P. taxifolia* [syn. *Podocarpus spicatus*]) and the seed is excreted often in a mound of corrosive dung.
- 2) Seed from high altitude and/or cold winter areas lie in the ground over the cold winter period and germinate in the spring, often after a few false starts, i.e., warm days then freezing nights.

Be aware that poor collection, extraction, and storage practices can create more intensive dormancy and death to the seed. Avoid high temperatures, and store in airtight containers under dark, cool, dry conditions. Animals, insects, and fungi readily consume seed exposed to outside pathogens. It is interesting to consider how many seedlings are needed to replace one giant tree in nature. If the seed isn't stored correctly, it may already be exposed to conditioning events that leads to an abortive attempt to germinate without your knowledge. When you attempt to germinate, the seed is already dead.

## TREATMENT

To produce quantities of seed we find a domestic food processor with a variable speed useful, for example:

- 1) *Pittosporum* species - mix capsules with fine sand and mix with cutting blade. Free running seed can be obtained by sieving or windrowing.
- 2) Beating *Sophora* or *Acacia* pods soon removes the seed from the pods.
- 3) Pulping of drupes enhances ease of flesh removal and seed cleaning.

A recent trend in our business is cleaning and sizing of seed for precision automated sowing. Specialist seed cleaning techniques and absolute precision sieves are necessary tools here. Germination rates are critical, as is consistency in time of germination and subsequent growth rates if good robust seedlings are to be produced in large numbers.

## GENERAL PRESENTATION DISCUSSION

**Cleaning of Sticky, Resinous, or Fluffy Seed.** The cleaning of some seed can be very difficult such as the fluffy seed of *Celmisia*. A method of cleaning fluffy seed is winnowing, sieving, or perhaps burning off if the seed is hard. Some suggestions for cleaning sticky or fleshy seed include fuels and detergents. Another possibility is the domestic food processor with the seed alone or placed in liquid or sand.

**Selection and Collection of Source Trees.** The seed from one tree of the same species or genera may not have the same seed properties as another tree of the same species or genera. This may be related to effects of provenance. When collecting seed it is worthwhile to be aware of this. It may occur that seed from a particular tree may clean or store better than seed from other trees in the same area. An example is in *Sophora*. The amount of stratification required seems to vary between trees from different localities. A useful method of collecting tree seed is to use a drop cloth underneath the tree and then shake the tree to encourage the seed to fall.