

A METHOD FOR IMPROVING SEED GERMINATION OF

SOLANACEOUS SPECIES

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It was evident at the recent Solanaceae Conference that several workers have been experiencing difficulties in the germination of seeds of certain solanaceous species. Since we have secured stands of some difficult items in Lycopersicon and Solanum, we submit the following account of our methodology.

Our most notorious problem is with L. cheesmanii, seeds of which will not germinate for us without pretreatment, no matter what the age of seeds, temperature regime, soil mixture or other conditions of sowing. Seeds of certain accessions of L. chilense, L. hirsutum, L. peruvianum, S. lycopersicoides and S. juglandifolium are also refractory, although a small percentage often sprout without special measures. The germination of seeds of any species that are old or otherwise in poor condition may likewise benefit. Such pretreatments as vernalisation, sulphuric acid, gibberellic acid, high temperatures and other stresses were applied to L. cheesmanii seeds without success. It finally became apparent that the dormancy is vested in the seed coats, the virtual removal of which is essential to sprouting. Laborious chipping of the seed coat with a sharp scalpel provided the clue. Passage through the gut of Galápagos tortoises is more effective, but cumbersome, nasty and otherwise too inconvenient for general use. The method finally adopted is commonly used by agronomists for seeds of certain cantankerous legumes.

For general use, seeds are soaked in 2.7% sodium hypochlorite (half-strength standard household bleach) for 30 minutes, then thoroughly rinsed in tap water and sown directly or dried for sowing within the next few days. A single treatment hardly ever suffices for L. cheesmanii seeds, which must be treated at weekly intervals for as long as two months. The entire testa may thereby be removed, but the endosperm and embryo appear to withstand such seemingly violent treatment. These repeated applications cannot be applied, of course, to seeds planted directly in soil. Instead,

we incubate the seeds on moist blotting paper in plastic sandwich boxes or any other suitable transparent container. The boxes are kept in an illuminated incubator maintained at 25° day, 18°C night temperatures, but ordinary room conditions are satisfactory. Keeping the seeds in the dark until sprouted seems to be advantageous. When the seeds have germinated and the cotyledons are well developed, the seedlings are transplanted to nursery or flats or pans filled with sterilised soil and placed in partial shade in the greenhouse. We control post-emergence damping off by repeated drenches of benlate and dexton.

CULTIVATION OF DATURA AND SOLANUM SPECIES IN
ECUADOR FOR INDUSTRIAL PURPOSES

(Extract from a letter by Dr. Luis Levy, Director of INEXA, Industria Extractora, S.A., Quito, to Dr. Charles Heiser, 1st November, 1975)

Datura sanguinea. Since 1969 we have been producing scopolamine on a commercial scale from the leaves of this plant. During the first three years we used wild plants as our source, but since then three commercial plantations have been started (a total of about 200 hectares) and now most of our supplies come from these plantations. The largest one is located east of Latacunga and a second is north of Quito, on the slopes of the Mojanda mountains. Both localities are about 2,900m above sea level. Interestingly, Ecuador issued some postage stamps depicting this plant, after our industrial development got under way. The value of this project is that D. sanguinea contains only traces of atropine whilst most other commercial sources of scopolamine (i.e. Duboisia myoporoides) contain vast amounts of atropine along with the scopolamine and this causes quite a few technical problems during processing. The present value of scopolamine exported from Ecuador is around US \$600,000.

Solanum marginatum. The material we are using is probably this species but I am not sure. Interest in solasodine has been very great since the supplies of diosgenin from Dioscorea in Mexico have become so scarce. We are making plans now to build