

# Auchgourish Botanic Garden

## Scotland's Millennium Botanic Garden



### Experimental Seed Germination outcomes in the Genus *Lilium*.

**Abstract summary.** Auchgourish Botanic Garden (ABG), in association with Botanic Gardens Conservation International (BGCI), has undertaken responsibility for the ex situ International Conservation of the genus *Lilium* and its allies, *Cardiocrinum*, *Nomocharis* & *Notholirion*. As part of this project ABG is investigating all aspects of the cultivation of *Lilium* from seed through to maintaining genetically diverse populations derived from wild provenance collected material representative of each taxon and to provide such information as can be reasonably made available to those interested in the propagation of *Lilium*, etc. The following information is a summary of recent work prior to the new monograph's publication (*in prep*).

**Background.** During the course of extensive literature searches and information exchanges with various individuals and institutions much is made by many writers of the difficulties in achieving timely germination of seed derived from Lilies - species, whether wild collected or cultivated hybrids. Germination is reported variously to be erratic or delayed, whether hypogeal, epigeal or sown fresh in Autumn or in Spring, or alternatively subsequently from cold storage. In order to maximise viable plants from sometimes rare or difficult to obtain seed a method is therefore required to shorten and improve germination. Embryo rescue has no botanical conservation value and was not considered. Costly man hours and systems to deal with erratic germinations have an unwelcome impact on ABG's limited resources.

**Materials & Methods.** The investigations covered annual periods of 2006-07, 2007-08, 2008-09, and the current 2009-10. Seed used has variously been derived from wild origin sources as well as from cultivated plants of known wild origins. All seed is from botanical taxa mostly at species and subspecies levels. Seed sowing commences each year from early Autumn, through October onwards during Winter and into Spring, as and when the seed has either been collected from the material available at ABG or arrived from botanical collectors, Botanic Gardens and individuals. Most seed is from fresh collections but occasionally from stock held in cold store which may be several years old. Seed is stored at between 0 C to 5 C. Seed germination for 2009-10, includes 102 taxa, 198 lots, has been from 12 days for *Lilium lophophorum* to 110 days for dwarf *Lilium* aff. *martagon* ex Mongolia. Commercial production would presumably scale up.

Each seed lot is sown into vermiculite, either the fine grade or the medium grade; however due to Health & Safety concerns the fine grade is no longer used as it can and does cause respiratory problems if blown around when disturbed. The advantage of the finer grade has allowed seed to be more easily seen, however comparative sowing of seed replicated in both grades has shown no difference in outcomes. The vermiculite is soaked prior to its use, generally 30-60 minutes is sufficient after which the damp medium is transferred to clear polythene food bags, zip lock type or others, each bag is squeezed to express surplus moisture, the seed lot is added then mixed through. Bags are checked weekly, seeds showing discolouration are removed. Each weekly lot of bagged seed is transferred into clear plastic food boxes and stored indoors at ambient room temperatures (c. 18 – 20 C) and exposed to natural daylight. Due to the northern latitude at ABG (c. 58 degrees North) supplementary grow-bulb lighting is supplied for 8 hours between 15<sup>th</sup> November through to 31<sup>st</sup> March. Once c. 10% of seed germinates the seed lot, with the medium, is transferred to pots of varying sizes to be grown on, these are covered in a clear plastic bag held in place by elastic bands, this functions as a mini-greenhouse for a few weeks until germination is complete during which period weak liquid feed is introduced through both over-head and wicked-up applications.

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**Note.** According to Haywood & Brummit, '*Flowering Plant Families of the World*' RBG Kew, there are now considered to be c. 150 species in the genus *Lilium* which more or less accords with the information now available following recent researches at ABG.

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