DANIDA FOREST SEED CENTRE'S SEED POLICY

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POLICY OF SEED SUPPLY

The seed catalogue includes seed belonging to three institutions: DFSC, FAO (Food and Agriculture Organization of the United Nations) and OFI (Oxford Forestry Institute).

The purposes for seed supply include:

1) Gene conservation stands (ex situ conservation)
2) Seed stands
3) Breeding populations
4) Genetic research
   - species testing
   - provenance testing
   - other genetic research, incl. seed research with genetic aspects
5) Other seed research
6) Small scale pilot plantations (yield and stand trials).

Each organization supplies their seed for specific purposes and programmes.

The seed is supplied free of charge, including the provision of phytosanitary certificate, and freight to airport, port or postal office of customer.

The stock of a seedlot ordered may have become exhausted by the time of ordering. DFSC will then either provide a reference to other suppliers or relay the order.

WHEN ORDERING SEED

Please be sure to provide the following details when seed is ordered:

. **Full address** of recipient of seed, including telephone, fax, telex, e-mail, or cable address.

. **Airport, port or station** for customs and plant quarantine clearance.

. **Date** when seeds are **needed** (note that 2-4 weeks are required before a confirmed order can be dispatched). The seed will normally arrive about 1 week after dispatch.

. **Purpose** for which seed is ordered:

- Conservation stand
- Seed stand
- Breeding population stand
- Species introduction trial
- Provenance trial
- Progeny trial
- Other genetic research
- Seed research, type and objective
- Small scale pilot plantations
- Other

. Regarding **quantity** of seed:

Where plants are to be raised for planting purposes, please state the number of ready nursery plants needed or the size of the area for planting. The quantity of seed in grams will be calculated according to purity, 1000-grain-weight, germination percentage or other viability criteria, an expected loss of 50% in nursery and during transport, a plant spacing of 3 x 3 metres in the field, and a 25% replacement in the field.

Specifically, for species, provenance and progeny trials, unless otherwise stated, the number of ready plants per seedlot is assumed to be 144 (4 plots each of 6 x 6 plants). Account will be made for losses as above given.

For seed research, please inform of the number of seeds needed, not only the quantity in grams.

. If the **plant quarantine authorities** require an import permit for tree seed. Any permit needed must be available, or sent to DFSC, as appropriate before seed can be dispatched. Note that it may take several weeks/months to obtain a permit.

. Any special **phytosanitary examination or treatment** required.

. Any other information that may facilitate the clearance of the seeds ordered.

WHEN RECEIVING SEED

Please remember to **acknowledge** receipt of seed. To facilitate this, a yellow card will be enclosed with the seed. The card must be filled in with date of receipt and condition of package and seed, and then returned to DFSC.

INFORMATION AVAILABLE WITH SEEDLOTS

The seed package will include an invoice stating (i) that the seeds are free of charge (ii) that they are for scientific purposes only and (iii) essential information on each provenance. In addition a seed quality sheet is included showing important seed quality test results. For certain purposes and seedlots, more detailed information on the provenance can be supplied on request.

Accession number

The main reference to a seedlot supplied is the DFSC accession number. The number is made up of a serial number followed by a stroke and two digits for year of receipt at DFSC, e.g. 01748/88 (seedlot number 01748, received in 1988). If there are no digits after the stroke, it refers to an earlier numbering system abandoned in 1982. Two more digits after the year indicate that the seedlot comes from one single tree or a clone, e.g. 01773/8812. Single-tree seedlots from the same family have the same serial number, e.g. 01773/8812 and 01773/8833. When the two last digits are 00, it indicates that the seedlots of the family have been bulked.

If requested, accession numbers which have been issued by the oranization supplying the seeds in the first instance can be provided.

Origin and quality

Because of lack of space the seed list only gives sparse information on provenance and seed collection data. Supplementary data on collection and provenance are given in the invoice. Where available, customers can request more detailed information.

Seed quality is given by the latest germination percentage and the number of viable seeds per gram. Results of alternative test methods of viability (x-ray, tetrazolium or cutting test) are omitted in this list, but will be provided with the invoice. Most germination tests are less than three years old in 1996. If the germination percentage is not known, the calculation of number of viable seed is based on results of alternative tests.

I. DFSC SEED

The DFSC seedlots have been obtained for several purposes, including general exchange, and are of different quality.

DFSC does not supply seed for large scale plantations. Some exceptions to this rule may be given, if, for example, there is an accumulation of seed from provenances that are not threatened. In particular, seedlots showing signs of imminent loss of viability may be used for general plantation establishment, if there is no other request for them.

The seedlots have been divided into 4 categories (G, C, L, and I) reflecting the genetic and physiological quality of the seed. It is important to consider the different qualities when seeds are ordered.

Group G: **General purposes**

The seedlots are provided with sufficient information of provenance and collection; they form good representative collections. The seed is available for any of the 6 purposes listed under "Seed policy". The seedlots may be an excess of seed obtained for gene conservation (see below).

Group C: **Seed for ex-situ gene conservation**

From 1982 to 1990 the activities of DFSC, with regard to seed procurement, were concentrated on the programme: "Seed and Gene Conservation Stands of Tropical Pines". This programme has its background in the global programme "Improved Use of Forest Genetic Resources"[1].

A number of seedlots, representing threatened provenances, were collected primarily for establishment of gene conservation stands. These seedlots represent well-identified provenances, and detailed collection data is available.

The goal stipulated by DFSC for gene conservation stands was the establishment of a global total of 200-500 hectares per provenance, with each stand having a minimum of 5 hectares. In spite of the good support received, this goal has not yet been reached for many provenances. The progress of this, as well as other similar programmes, is being evaluated at present.

Is is evident, however, that there is a continuous need for more countries to participate in the programme. Contribution will be in the form of establishment, protection and management of the conservation stands, and later with information on the progress of establishment and development.[2]

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1 FAO Panel of Experts on Forest Genetic Resources in 1969-70 "Forest Genetic Resources Information". No. 4 FAO Occasional Paper 1975/1.

2 DFSC Technical note no.14 provides guidelines for establishment and management of gene conservation stands.

A special reserve of some of the most important or threatened provenances is kept in long term storage as a form of ex situ conservation.

Group L: **Low Viability Seed**

Some seedlots are of critically low viability. They were obtained for the purposes under group C and G, but are now considered suitable for only some types of research where the low viability, and therefore possible poor genetic representation of the original material, is not critical.

Group I: **Inferior Seed**

For some seedlots the information on provenance and collection is insufficient or they may represent only a narrow genetic variation. They are considered suitable only for some types of seed research and investigation where genetic information is not critical.

II. OFI SEED

The seedlots in this group are intended for international provenance trials of *Pinus kesiya* and *Pinus yunnanensis*, a scheme initiated by the Oxford Forestry Institute and Danida Forest Seed Centre as a result of a IUFRO meeting held in Zimbabwe in April 1984.

Following the evaluation in the early 1970'es of a provenance sheme of *P. kesiya*, limited mainly to Philippine provenances, it was agreed that a new sheme was needed to include sources from a wider range of the natural distribution, as well as 'landraces' (locally adapted populations outside natural range). In cooperation with the host countries of *Pinus kesiya* sources, OFI and DFSC would coordinate a programme for the collection and distribution of the seed for these new trials. The collection was completed in the spring of 1987.

The new scheme has four objectives, which can be summarized as follows:

1. to study between-provenance variation in provenance trials using **bulked seed** within provenance.

2. to study within-provenance variation in progeny/ provenance trials using separate **half-sib families.**

3. to establish provenance conservation stands using **bulked seed** within provenance.

4. to create breeding populations in seedling orchards using **family identified** or **bulked seed**.

All seed collected is stored and tested at DFSC, from where it will eventually be distributed to participants.

DFSC and OFI will coordinate all recording of collections and origin as well as of storage and distribution.

So far, more than 16 trials in 9 countries are known to have been established and seed for 41 field experiments have been distributed to 18 countries. The trials established are to be assessed during 1996-1997.

The viability of the seed is still remarkably high, and new participants from tropical developing countries are welcome.

Requests should be sent to the DFSC or OFI clearly stating the type and composition of trial or planting required.

III. FAO SEED

In 1979, FAO's Forestry Department initiated a project "Genetic Resources of Arid and Semi-arid zone Arboreal Species for the Improvement of Rural Living". The main purpose of the project was to act as a catalyst for gathering genetic information on arid and semi-arid zone species, and to assist countries in the practical application of any results which may become available. The progress of the project is occasionally reported in FAO's periodical "Forest Genetic Resources Information".

Originally eight countries participated in the project, which received financial support from the International Board of Plant Genetic Resources (IBPGR) from 1980 to 1985. The first phase of the project mainly involved systematic seed collections of *Acacia, Atriplex, Cercidium* and *Prosopis* species from well-defined sites (provenances). By the end of 1988, 275 provenances of 35 species, sub-species and varieties had been collected by the cooperators in the project. The seed collected is stored and tested at the DFSC and distributed from here as a Danida contribution to the project[3].

From 1985, distribution of seed has been extended to other developing countries for sites with less than 500 mm annual rainfall and/or a dry season of more than 6 months.

During 1983-89 field trials were established by 40 institutes and projects in 22 countries. In 1989 a circular letter was sent out by FAO to the institutes that had received seed, requesting information and inviting participation in an overall global evaluation. Initially, 20 of the oldest trials (established 1984-87) in 8 countries were selected for the overall evaluation carried out in collaboration between national institutes, FAO and Danida Forest Seed Centre. Pilot evaluations were carried out in India, Pakistan and Senegal to determine methodologies. Assessment of the trials began in 1990 and evaluation of the results are in progress.

The scheme is still open to potential participants. Seeds are ordered through the DFSC. Conditions and details of participation are avilable from: FAO, Forest Resources Division, Forest Resources Development Branch, Via Terme di Caracalla, 00100 Rome, Italy.

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[3] Seedlots which contain less than 15.000 living seeds do not appear in the catalogue and are not for distribution, but will be kept for possible gene conservation and seed stand programmes.