

PROJECT 5

IDENTIFYING, GERMPLASM STORAGE AND *IN VITRO* PROPAGATION OF *PHYTOPHTHORA* AND CANKER THREATENED TAXA

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1. IDENTIFICATION OF RARE AND THREATENED FLORA AT RISK FROM DIEBACK DISEASE

The Department of Conservation and Land Management Declared Rare (Threatened) and Priority Flora List for Western Australia (Ken Atkins 14/09/95) is currently being used as the basis for all collections. A new updated list is pending. Recently collections have focussed on WA's critically endangered taxa as well as continued collections of *Phytophthora* and canker dieback susceptible species in the south-west of the State. Consultation with Kings Park and Botanic Gardens has highlighted the gaps in the *ex-situ* conservation of the critically endangered taxa and additional effort will be made to secure germplasm of these species in the face of declining populations and possible extinction. The plant groups targeted for collection continue to be predominantly from the families Proteaceae, Epacridaceae, Fabaceae, and Myrtaceae.

2. IN VITRO PROPAGATION

Discontinued (see Year 1 report)

3. CRYOSTORAGE

Discontinued (see Year 1 report)

4. SEED COLLECTION

Three hundred and forty-one accessions of rare or priority taxa have been incorporated into the Threatened Flora Seed Centre as of 12 September, 1996. This represents 149 taxa in 14 families. Good genetically representative seed collections of many of the 38 critically endangered taxa have been made. Several visits to the northern sandplains have resulted in the collection of a number of accessions of rare and geographically restricted taxa. Other collection trips have been in the species-rich south coast and southern sandplains.

New populations of threatened taxa and extensions of previously known populations continue to be discovered on routine collection trips. Communication between

CALM districts and the TFSC remains excellent with assistance being given for collections and the provision of field advice. Whilst in the field, staff of the TFSC continue to collect additional germplasm material from critically endangered and other taxa for cultivation at Kings Park and Botanic Garden.

This past field season has served to consolidate our knowledge and understanding of some of the variables that affect phenology, pollination, seed set, and seed ripeness as well as the identification of seed of a wide variety of species.

5. SEED STORAGE, VIABILITY TESTING AND INVENTORY SYSTEM

One hundred and thirty-six accessions have been retested for viability after 1 year in storage at -18°C or at 4°C . This comprises fifty-six taxa. The majority of accessions responded positively to storage conditions with little to no loss in germinability and in some instances improved germinability. Encouraging germination results continue to be gained through the use of new techniques such as those developed by Kings Park and Botanic Gardens (e.g. the use of smoke to break dormancy and enhance germination of *Verticordia* spp.).

New accessions will continue to be monitored on a yearly, then 5 yearly basis until adequate knowledge of the flora's response to sub-zero storage is attained.

The WAsSeed database is nearing completion. Germination results for all accessions have been databased and graphed, to enable ease of monitoring response of seed to storage conditions. The phenology database continues to be updated as new information and new species are added to the list of flora being targeted by the TFSC.

New articles on seed germination and dormancy, and storage techniques continue to be added to the TFSC reprint collection, which is fully databased.

A new walk-in coolroom and freezer room and humidity and temperature controlled drying room have recently been constructed. These facilities will enable greater control over the drying and storage of seed, and will permit more advanced research into the response of Western Australian species to moisture content reduction and freezing.

6. FUTURE COLLECTIONS AND PROPOSED DEVELOPMENTS

The coming year will see continued collections of threatened flora from the south-west and resampling of previously collected taxa. Additional populations of targeted flora will be added to the accessions where necessary to consolidate the gene pool of that taxon.

A Churchill Fellowship was awarded to the manager of the Threatened Flora Seed Centre for 1997. Plans are now underway to visit genebanks in the USA and the Seed Conservation Section of Wakehurst Place, Kew, UK for approximately 3 months.

Visits to the International Plant Genetic Resource Institute in Rome have been tentatively arranged and contacts are being made with researchers in South Africa. The increase in knowledge that will be gained from this opportunity to visit other scientists in genebank management overseas will be invaluable to the operations of the TFSC and assist in our efforts to conserve the native flora.

The results of the past three years' work on the response of native seed to low moisture and low temperature storage is being prepared for publication.

A technical officer has been seconded from Kings Park and Botanic Gardens for one year to assist with collections and laboratory testing of seed. It is hoped that continued research into seed storage and seed germination and dormancy breaking mechanisms for the south western flora will assist our knowledge of seed biology and enhance the overall effectiveness of the operation of the TFSC.

In the laboratory, research into a variety of techniques to promote germination continue to result in a better understanding of the biology of some of the threatened taxa. The use of growth hormones, smoke, heat treatment and scarification have provided useful information for assessing viability and determining the optimum methods for germination of seed collected.

**CONTROL OF *PHYTOPHTHORA*
AND *DIPLODINA* CANKER IN
WESTERN AUSTRALIA**

**PROGRESS REPORT TO THE
ENDANGERED SPECIES UNIT,
AUSTRALIAN NATURE CONSERVATION AGENCY**

OCTOBER 1996

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