

CSP33C  
start 7/91 cease 10/92.

**FINAL REPORT ON COTTON RESEARCH AND DEVELOPMENT  
CORPORATION PROJECT CSP33C:**

**COLLECTION AND MULTIPLICATION OF GERMPLASM OF WILD  
GOSSYPIUM SPECIES FROM EASTERN AUSTRALIA**

The project was intended to collect germplasm of two of the wild relatives of cotton, *Gossypium australe* and *G. sturtianum* from eastern Australia, and to initiate a seed bank of these species.

The Australian species of *Gossypium* are the focus of increasing interest by researchers working in the field of cotton improvement, especially from the viewpoints of host-plant resistance and tissue-specific variation in gossypol content. Another aspect of recent interest is consideration of the risk of introgression to wild species from genetically modified lines of cotton. Inadequate samples were held in Australian germplasm collections for studies in these areas to be conducted satisfactorily and CRDC funded the work reported herein, i.e. the collection of germplasm and commencement of its multiplication.

**Project execution**

The project was accomplished through determination of locations from which the two *Gossypium* species had been collected previously, and then travel to these sites to search for the species and collect seed or, if seed was not present, cuttings. The former aspect required consultation of specimens lodged in herbaria in Canberra and Sydney, and extraction of specimen information held in a computer database in Brisbane. A route was planned to enable search for the two target species as close as possible to regions in which cotton was cultivated in Queensland and New South Wales. A list of the collections made and a map showing their locations are attached. Herbarium voucher collections were made of each population collected; these are lodged in the Australian National Herbarium in Canberra.

Participating personnel were L.A. Craven and J.P. Grace, both of the CSIRO Division of Plant Industry, Canberra, and P. Lawrence, Queensland Department of Primary Industries, Biloela. The fieldwork commenced on 8 June 1992 and concluded on 21 June 1992.

The species of primary importance for collection was *G. sturtianum* as it apparently occurs quite close to cotton fields and conceivably could receive insect-borne pollen from cotton. It was discovered during the fieldwork that in the Theodore district this species occurs within approximately three kilometres of irrigated land which is used at one time or another for cotton production. In all six seed collections, and

one in the form of cuttings, of *G. sturtianum* were made. The other species, *G. australe*, is of lesser concern from the viewpoint of risk of introgression from transgenes as it occurs further from present areas of cotton production. Sixteen seed collections of this species were made.

## Results

A notable discovery made in the field was a hybrid between *G. australe* and *G. sturtianum*, collected north of Jundah at a site at which both parent species were collected also. The plant was intermediate between its parents in gross morphological features, and carried no fruit although it showed evidence of extensive flowering. This plant is the first known case of natural hybridisation involving two Australian species of *Gossypium*. Cuttings were collected of this plant for propagation in Canberra.

The seed collected presently is undergoing increase at Canberra for those accessions in which too little was available for directly placing in long-term storage. The cuttings were rooted successfully but failed to establish; the reason(s) are unknown but it is suspected that they had reacted negatively to potting on before they had adapted to the greenhouse to which they had been transferred after root initiation. Subsequently, seed has been received from the property owners upon whose land the cuttings of *G. sturtianum* were collected. This seed was from a stand of plants approximately two kilometres from that which we had sampled as cuttings. Thus the only accession we have failed to bring into cultivation is the hybrid plant; unfortunately we have no contacts in the Jundah area through whom we might be able to receive further cuttings.

*Gossypium sturtianum* was found to be an uncommon plant in Queensland and New South Wales. However, during the course of the fieldwork it became apparent that many local people knew it quite well, but not by its scientific name. Mostly it was called Desert Rose but occasionally Sturt's Desert Rose, which is the better-known name in southern Australia. We concluded that preparation of a flier describing the plant and asking for seed samples would be a cost effective means of obtaining additional samples from areas in which the species occurs. Such a flier has been produced by the CSIRO Division of Plant Industry's Communication Unit; a copy is attached. The flier will be distributed to people within the natural range of the species via diverse routes, such as Landcare groups, Field Naturalist Clubs, and the CSIRO Double Helix Club.

L.A. Craven  
J.P. Grace  
P. Lawrence

April 1993

**List of samples collected during CRDC project CSP33C**

**Gossypium australe**

1. Roadside 9-13 km W of Blackwater on the Landsborough Highway, Qld. Medium population; seed collected.
2. 95 km from Clermont on the Charters Towers road, Qld. Large, extended population; seed collected.
3. 145 km from Clermont on the Charters Towers road, Qld. Small population; seed collected.
4. 201 km from Clermont on the Charters Towers road, 1 km S of Blackwattle Creek, Qld. Medium population; seed collected.
5. 251 km from Clermont on the Charters Towers road, at Myrtina Station turnoff, Qld. Small population; seed collected.
6. 66 km from Charters Towers along the Clermont road, Qld. Small population; seed collected.
7. 9 km from Charters Towers on the Hughenden road, Qld. Medium population; seed collected.
8. 101 km from Charters Towers on the Hughenden road, Qld. Small population (possibly adventive); seed collected.
9. 16 km S of Torrens Creek on the Aramac road, Qld. Medium population; seed collected.
10. 9 km S of Prairie on the Muttaborra road, Qld. Large population; seed collected.
11. Porcupine Gorge, 66 km N of Hughenden on The Lynd road, Qld. Large population; seed collected.
12. 40 km E of Hughenden on the Charters Towers road, Qld. Large, extended population; seed collected.
13. 24 km from Longreach along the Winton road, Qld. Large population; seed collected.
14. 2 km S of Glenariff Station turnoff, Longreach-Jundah road, 41 km N of Jundah, Qld. Small population; seed collected.
15. 43 km S of Jundah along the Windorah road, Qld. Medium population; seed collected.

16. 1 km N of Windorah on the Jundah road, near the airstrip. Very large population; seed collected.

**Gossypium sturtianum**

1. 18 km from Theodore on the Cracow road, W slopes of Mt Ox, Qld. Very large population; seed collected.

2. 10.6 km from Bauhinia Downs on the Duaringa road, 5.8 km along the Oombabeer road, Qld. Small population (7 plants found); seed collected.

3. Base of Mt McDonald on southern side, Telemon Station, Springsure area, Qld. Large population; seed collected.

4. Wallalee Station (on Arcturus road), Springsure area, Qld. Small population (6 plants found); cuttings collected.

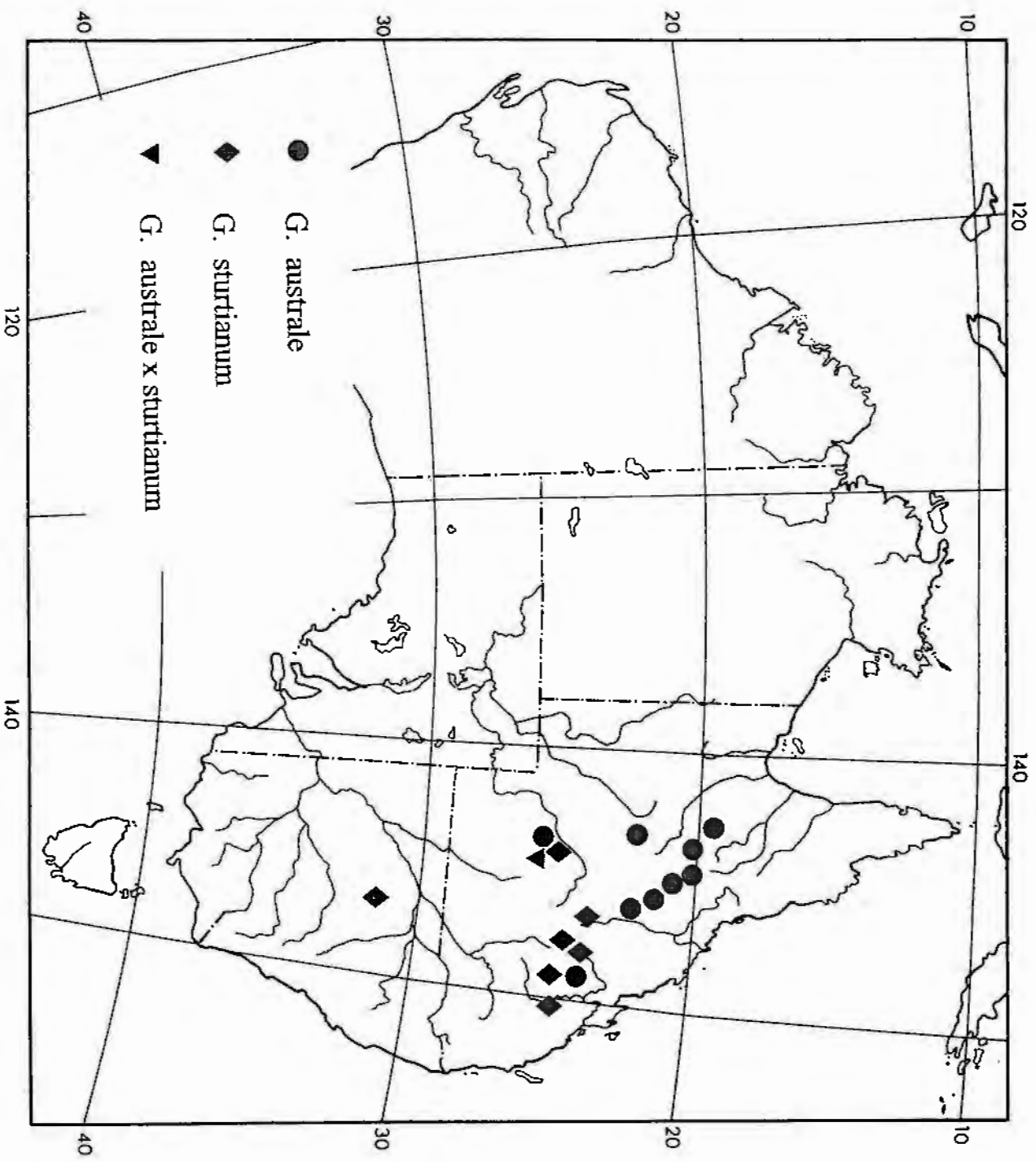
5. c. 16 km from Anakie along the Alpha road, Qld. Medium population; seed collected.

6. 2 km S of Glenariff Station turnoff, Longreach-Jundah road, 41 km N of Jundah, Qld. Medium population; seed collected.

7. On eastern outskirts of Coolabah on the Brewarrina road, NSW. Single plant; seed collected.

**Gossypium australe X G. sturtianum**

1. 2 km S of Glenariff Station turnoff, Longreach-Jundah road, 41 km N of Jundah, Qld. Single plant; cuttings collected.



# HAVE YOU SEEN THIS PLANT?



## DESPERATELY SEEKING 'DESERT ROSE'

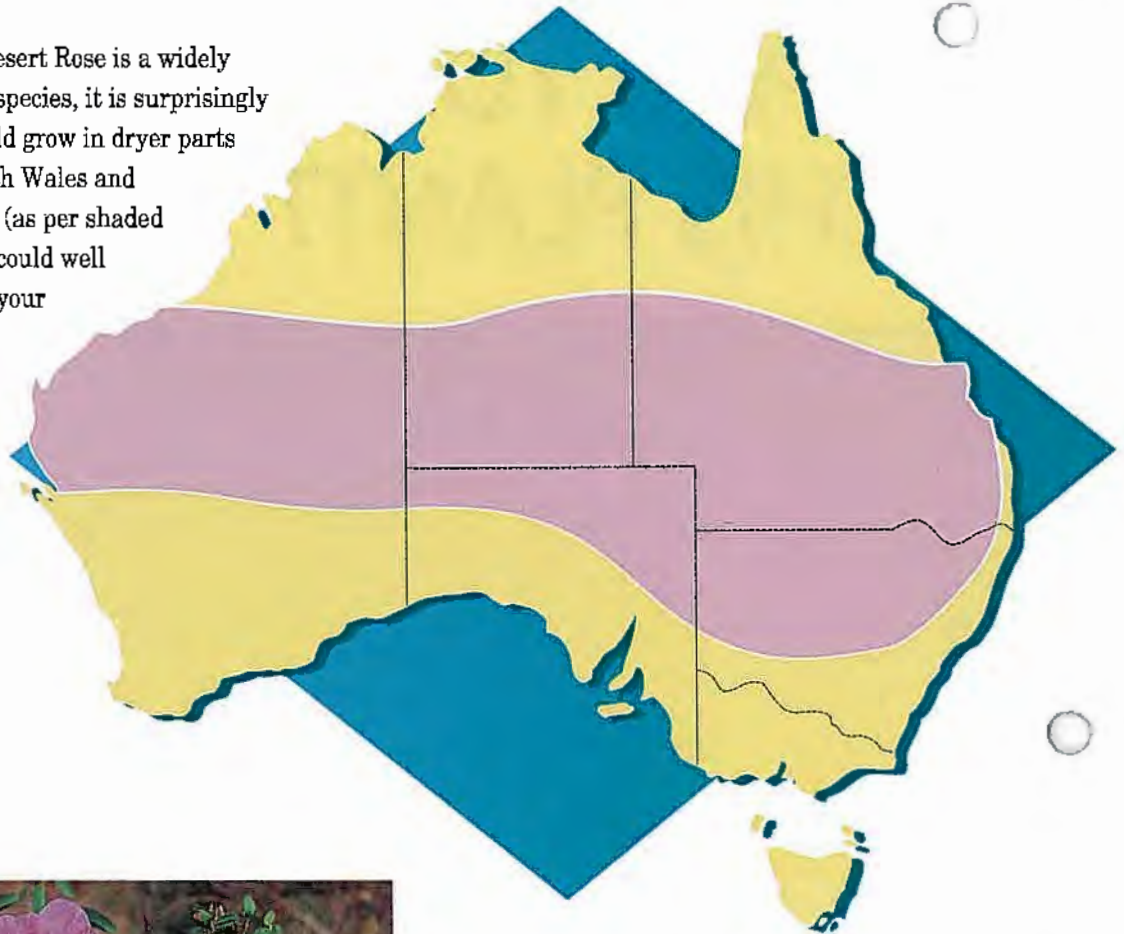
CSIRO researchers are seeking *Gossypium sturtianum*, better known as Desert Rose or Sturt's Desert Rose. Although the Northern Territory has claimed Desert Rose as its floral emblem, the plant has been found from the Pilbara region of Western Australia through central Australia to the highlands of eastern Australia.

## WHY IS IT IMPORTANT?

Botanists at the CSIRO Division of Plant Industry are studying the plant because it is a close relative of cotton. It has some useful features which could be incorporated into cotton to develop a crop plant more suited to Australian soils and climates.



Although Desert Rose is a widely distributed species, it is surprisingly rare. It could grow in dryer parts of New South Wales and Queensland (as per shaded areas), and could well be found in your district.



## A DESCRIPTION OF DESERT ROSE

Desert Rose is a shrub from 50 cm to 2 m tall (18 inches to 6 feet). It has mauve, Hibiscus-like flowers and round, blue to greyish leaves (young leaves are more green than blue/grey). The leaves are waxy and usually round but the edges of some leaves can be slightly indented. Because cattle are attracted to Desert Rose, the plant is extensively grazed and therefore has become very uncommon.

## HOW YOU CAN HELP

CSIRO researchers would like to receive Desert Rose seed in order to grow plants to study. If you know where the plant grows in your area, and you can collect some seed, researchers would greatly appreciate a small collection, about 20 or 30 seeds. Along with the seed, researchers would like to know where you found the plants so that this information can be documented and its distribution more accurately recorded. If it grows in several different places in your region, please collect some seed from each - but remember to keep the seed lots separate!

If you are having difficulty identifying Desert Rose, collect a leafy twig about 15 cm long (6 inches) and send it to CSIRO for verification.

**Please send seed or twigs for checking, to:**

Mr Lyn Craven  
CSIRO Division of Plant Industry  
GPO Box 1600  
CANBERRA ACT 2601



PLANT  
INDUSTRY