

1986/1/DAN20C  
85/1043

C 1986 ✓ 7/85 to 6/86

## FINAL REPORT

Authorised Body: **COTTON RESEARCH AND DEVELOPMENT CORPORATION**

Project Number: DAN 20C

Project Title: ***MACHINERY FOR SOIL PROFILE AND PHYSIOLOGICAL STUDIES***

Field of Research: Soil Science

Organisation: NSW Agriculture

Address: Locked Bag 21  
Orange NSW 2800

Project Supervisor: Dr W. Mason  
Regional Director of Research, Tamworth

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Research Staff: Mr I.G. Daniells, Chemist  
Agricultural Research Station  
Narrabri NSW 2390

The late Dr A.S. Hodgson

Mr R.C. Scott  
Agricultural Research Station  
Narrabri NSW 2390  
(now located NSW Agriculture, Orange)

Administrative Contact: Mr R.C. Scott, Professional Officer (Industry Funds)

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Commencement and Completion Dates: July 1985, June 1986

### OBJECTIVES:

To provide equipment to enable soil pits to be easily dug for detailed observation of soil profiles giving a better understanding of soils and the effects of crops, compaction and other physical and chemical properties.

The equipment would also be a valuable resource for general operation on the research station for the construction and maintenance of irrigation structures.

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## BUDGET SUMMARY:

	1985/86
Salaries	-
Operating expenses	-
Capital Item	\$25,000
Total	<u>\$25,000</u>

## RESULTS:

The purchase of the excavator (backhoe/front end loader) has become a valuable tool for both research and general operations on the Agricultural Research Station, Narrabri. The backhoe can be easily transported on the research station's low loader and is constantly used both on station and off.

The studies of soil compaction and water infiltration have developed and lead to the production of the SOILPAC manual. The following projects have been assisted with purchase of the backhoe/front end loader.

- DAN 13 "Restoration of soil structure in cracking clays"
- DAN 25 "Effect of tillage practice on nitrogen fertiliser strategy and soil structure"
- DAN 41 "Development of SOILpak, a decision-support system for soil management"
- DAN 45 "Soil management training for advisers to cotton growers"
- DAN 46 "Procedures for the evaluation of soil physical conditions in the field to assist land management for cotton production"
- DAN 64 "Soil management training"

## BENEFITS TO THE INDUSTRY:

A better understanding of soil and what is happening in the cropping situation is being gained and the use of a backhoe to dig soil pits is becoming a practice with growers especially if agronomic problems are encountered. The understanding of what happens in the soil can be seen and studied often leading to rectification before serious damage occurs. It is expected that soil pits will become a common practice to better understand crop husbandry.

## FUTURE RESEARCH:

It is recognised that a comprehensive understanding of soil compaction and plant behaviour in various soil types is essential for optimum production. The use of backhoes as a basic tool will become more common. The unit purchased for the Agricultural Research Station, Narrabri is being well maintained and will be in use for several years so will be used in future soil research programs.



R.C. Scott  
31 October 1991