



Proceedings of the Soils & Agronomy Coordination Meeting

3 - 4 December, 1996

Richard Williams Conference Room
Australian Cotton Research Institute
Narrabri NSW 2390

Cotton Research and Development Corporation

Cooperative Research Centre for Sustainable Cotton Production

**Proceedings Compiled by
Ian Rochester and Karen Larsen**

***The information contained within this publication
may not be cited without permission of the author.***

Contents

		Page
Soils research priorities - ACGRA	D. Anthony / H. Bligh	3
Farming systems research		
Rotation crops and N fertilization	I. Rochester	4
Soil organic matter	G. Blair	7
Soil structure	N. Hullugalle	10
Pathology, VAM	S. Allen	11
Weeds	G. Charles	13
Dryland systems / modelling	P. Carberry	16
Machinery	M. Schoenfisch	17
Nutrient removal and balances	J. Quinn	18
Forum discussion - points raised		20
NUTRIlogic		
Background, need for package	G. Constable	21
What has been done to date; Format best suited to end users	M. Rea and D. Larsen	22
Discussion - nutrition research		23
Environmental issues		
Salinity Irrigation salinity	T. Willis	24
Understanding salinity	J. Triantafilis	25
Water quality	I. Gordon	29
Erosion Runoff and soil loss	D. Yule	35
Ped fabric studies	L. Sullivan	36
Pollution Best management practices	A. Williams	39
Pesticide movement	I. Kennedy	40
Polyacryamide	L. Hugo	44
Precision farming	B. Whellan, A. McBratney, B. Boydell	45
Update on other projects		
Soil C fractions and sustainability	Abdul Conteh (UNE)	49
Soil properties related to degradation	Odeh (SU)	54
Soil quality assessment - MacIntyre valley	Alison Todd (SU)	60
Soil fauna and envirofeast	James Lytton-Hitchins (SU)	63
Breakdown of polyacrylamide	Anne Resgaard (SU)	72
Aggregation of particles in vertisols	Damien Field (SU)	73
Immunoassays for pesticides	Shuo Wang (SU)	77
Waterlogging on cotton nutrition	Ivan McLeod (UNE)	80
Soil microorganism manipulations	Subbu Putcha (NSWAg)	83
Development of Solicon	Libby Roesner (SU)	84
Managing the hydrological cycle	Janelle Douglas (UNE)	88
Improving Extension	B. Pyke	89
List of Attendees		93

Soils Research Priorities (notes from a recent ACGRA meeting)

Dave Anthony & Harley Bligh

The ACGRA discussed what the goals, objectives and directions it should be following in terms of research into soils, tillage and engineering issues. It was felt that agronomy and soil-tillage-engineering issues should be amalgamated under a "farming systems" title that provided for a more multi-discipline approach to farming practices closely related to land preparation and soils issues.

Goal:

To develop cotton farming systems which produce sustained high yields of high quality cotton under irrigated and rain-fed situations in an environmentally and economically responsible manner.

Objectives:

- To identify farming practices which contribute to a soil resource which supports highly productive cotton on a sustained basis.
- To identify the key soil parameters which are responsible for soil physical, chemical and biological health.
- To encourage a multi-disciplinary approach to farming options with particular attention to the interaction between various agronomic factors eg. soil structure, weeds and disease.
- To identify the tools required by farmers to pursue the most desirable farming practices.

Limitations requiring research:

The group identified issues which it sees as significantly limiting successful farming systems:

Stubble handling - Machinepak development important

Pupae control measures

Weed control in minimum tillage systems and stubble retention farming including herbicides

Nutrition -Nutripak development important

- nutritional factors in minimum tillage and stubble-retained systems

- nutritional factors in B.T. cotton fruiting patterns

Environmental work - reducing sediment and pesticide run-off

- stubble retention systems

Salinity work - this need to be on-going and is seen as a very serious issue where prevention is the key

Equipment work - guidance system work needs to be completed from listing through planting to cultivation

- stubble handling techniques

Precision farming - require more of a discussion paper from Prof. Alex McBratney on this issue

Collation of existing research:

The members raised a number of times the issue of collating and making accessible a database of existing research on farming system issues. This was seen as an essential step in identifying what research is further required and regarded as an important research project in itself. The ...pak system eg SOILpak and NUTRIpak was identified as a useful format for extending existing research.