COTTON INDUSTRY BENCHMARKING STUDY 2001 - A REVIEW

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Introduction

The Australian Cotton CRC extension team conducted the second cotton industry benchmarking study during the 2000/01 season. It was implemented as a follow up to the 1997 survey that focussed on the 1996/97 season to measure changes in industry practice during the four-year period and to identify current issues for research, development and extension.

This paper provides a broad overview of the survey results. The extension team focus groups will be undertaking detailed analyses of data with respect to specific aspects including agronomy and farming systems and the management of weeds, water, insects, diseases and spray application. The information derived from the data is of substantial value when used in the identification, prioritisation and planning of research, development and extension programs.

The 2000/01 survey

The survey was distributed in late 2000 with returns coming back through until mid 2001. It was focussed on the 1999/00 season cotton crop and growers were asked to respond 28 questions covering a diverse range of issues related to cotton production.

Table 1 provides a regional listing of the numbers of growers who responded to the surveys including the average number of years for which they had been growing cotton. Table 2 provides a summary of the mean area and yield produced by those growers.

Table 1. Number of surveys returned and years of production for each region.

Region	Number of growers		Number of years growing cotton
	2000	1997	
Balonne	11		15
Darling Downs	46	46	12
Dawson/Callide	11	17	25
Emerald	22	30	11
Gwydir	5	32	15
Hillston	3		3
Lower Namoi	17	41	24
Macintyre	14	14	15
Macquarie	23	47	13
Upper Namoi	27	63	11

Note: In 1997 47% of growers had been growing cotton for more than 10 years and 32% for 5-10 years.

Table 2. Benchmark numbers, areas and yields.

Production System	No. of Respondents		Mean Area (ha)		Mean Yield B/ha	
	2000	1997	2000	1997	2000	1997
Irrigated	125	236	627	745	7.33	7.71
Dryland	24	124	455	511	3.06	4.22
Both	29					

These tables indicate that, whilst all of the growers in each of the surveys were not the same, each group was similar and provide a reasonably representative cross section of the industry. In terms of plantings, the irrigation growers represent 21.5% of the total irrigated area in 1999/00 and dryland 24.5%. In total 22% of plantings for the season.

The total number of respondents in 1999/2000 (179) is less than 1997 (305). This is probably a reflection of the large number of surveys conducted within the industry and we acknowledge the resultant lack of enthusiasm for yet another survey. Consequently, the generous contribution of time and information by growers who responded to this benchmark survey is greatly appreciated.

Soil Management

The grey/brown/black/cracking clay soils are the predominant soil types used for cotton production along with some red brown earth and river alluviums.

Soil tillage systems are quite variable although the majority of growers are using conventional tillage systems often with middle busting. Chemical fallow management is commonly used but zero tillage was restricted to dryland cotton farms.

Permanent one or two metre beds are maintained by 66% of irrigators for two to five years and permanent wheel tracks by 19% of dryland growers.

Overall soil management strategies did not change substantially between 1996/97 and 1999/2000.

Likewise the major issues across all regions for soil management remained as pupae control, stubble management and rotation options. Salinity was identified as being of higher importance in the Balonne, Macintyre, Lower Namoi and Macquarie valleys.

Stubble Management

Stubble is predominantly slashed or pulled, mulched and incorporated. There has been a small reduction (2%) of pull rake and burn since 1997 with only 8% of growers burning stubble sometimes for double cropping purposes. Although most growers do not indicate having a problem with cotton stubble management, stubble size and decomposition were the main problems listed by some in this regard.

Rotations

Whilst there are fewer growers (35%) using 1:1 (one cotton then one rotation crop) and 1:2 rotations, the majority continue to rotate but with a higher frequency of cotton in 3:1, 4:1 and 5:1 rotations presumably reflecting the relative profitability of the crops and the impact of water reforms which lead to the preferential use of water on higher value crops.

Wheat is the most frequently grown rotation crop (46%) with 21% of growers using or trialling the planting of cotton into standing wheat stubble primarily for dryland crops.

Nutrition

The average rate of nitrogen fertilizer application has increased substantially from 125 kg N/ha in 1996/97 to 176 kg N/ha in 1999/2000 with higher rates applied to second, third and fourth year crops. On average, 127 kg N/ha is applied prior to planting with 53 kg N/ha side dressed and/or 23 kg N/ha water run.

There was an increased use of legume crops for nitrogen fixation from 8% of growers to 30%.

There is a wide range of mixed fertilizers applied with the majority using phosphate in some form. Potassium use has increased substantially from 4% of growers to 20%.

Herbicides

Herbicide use patterns have varied between surveys and will be analysed in more detail and reported by the weeds extension team. The main changes were an increased preplant use of diuron and a trend toward pendimethalin away from trifluralin but with an overall reduction in the use of grass herbicides. Conversely, post plant use of diuron has reduced from 51% to 4%.

Nutgrass, Bladder ketmia, Noogoora and Bathurst burrs, Bell vine and Sesbania were the weeds most frequently mentioned as being of concern or difficult to manage.

Diseases

The diseases of most concern to growers are black root rot, seedling disease and Fusarium across all regions with Fusarium the major concern on the Darling Downs. It should be noted that unidentified Fusarium could have been included in the seedling disease group.

Industry pathology research and extension officers will be examining the data in further detail.

Water

Flood irrigation was the primary irrigation system (90% of growers) with another 8 (4.5%) growers with some trickle or drip (SDI) and 4 (2.2%) using spray systems. Water sources are listed in Table 3 with many growers having access to two or three sources of irrigation water.

Table 3. Irrigation water sources.

Water Source	Regulated	Unregulated	All
Bore	38%	-	38%
Overland flow	-	32%	32%
River	60	20%	80%
Other		8%	

Other aspects of irrigation management were:

- Irrigation scheduling was based on experience combined with crop stage and rate of growth for most irrigators with:
    - Neutron probes used by 36%
    - Water balance models and weather data by 32%
    - Enviroscans by 9%
- 64% of irrigators measured amount of water pumped
- 26% of irrigators measured amount delivered to field
- 77% had tail water return systems
- 15% calculated total farm water use efficiency

Water use data provided by many of the respondents has been used to calculate water use efficiency (WUE) and the averaged data has been most beneficial to the Cotton CRC/DPI cotton and grains Rural Water Use Efficiency project in Queensland.

Planting

Planting configurations are summarised in Table 4.

Table 4. Planting configuration

Configuration	%/ Number of growers
1 metre rows	84%
2 metre beds	11%
30 inch cotton	2 growers
36 inch rows	2 growers
Ultra narrow row (UNR)	4 growers
Dryland - solid	52%
- single skip	18%
- double skip	35%

Insect Management

Some 76% of growers indicated that they had changed their approach to insect management between 1996/97 and 1999/2000 by:

- Adopting a softer approach
- Protecting and maintaining beneficial insects
- Adopting IPM
- Being more tolerant of damage and pest numbers
- Selective use of softer insecticides.

Figures 1, 2 and 3 provide a summary of the use of monitoring tools and thresholds and the awareness of pest management strategies in 1999/2000. The use of CottonLOGIC, Lepton test kits and pest thresholds had not changed substantially since 1996/97.

Figure 1. Monitoring tools

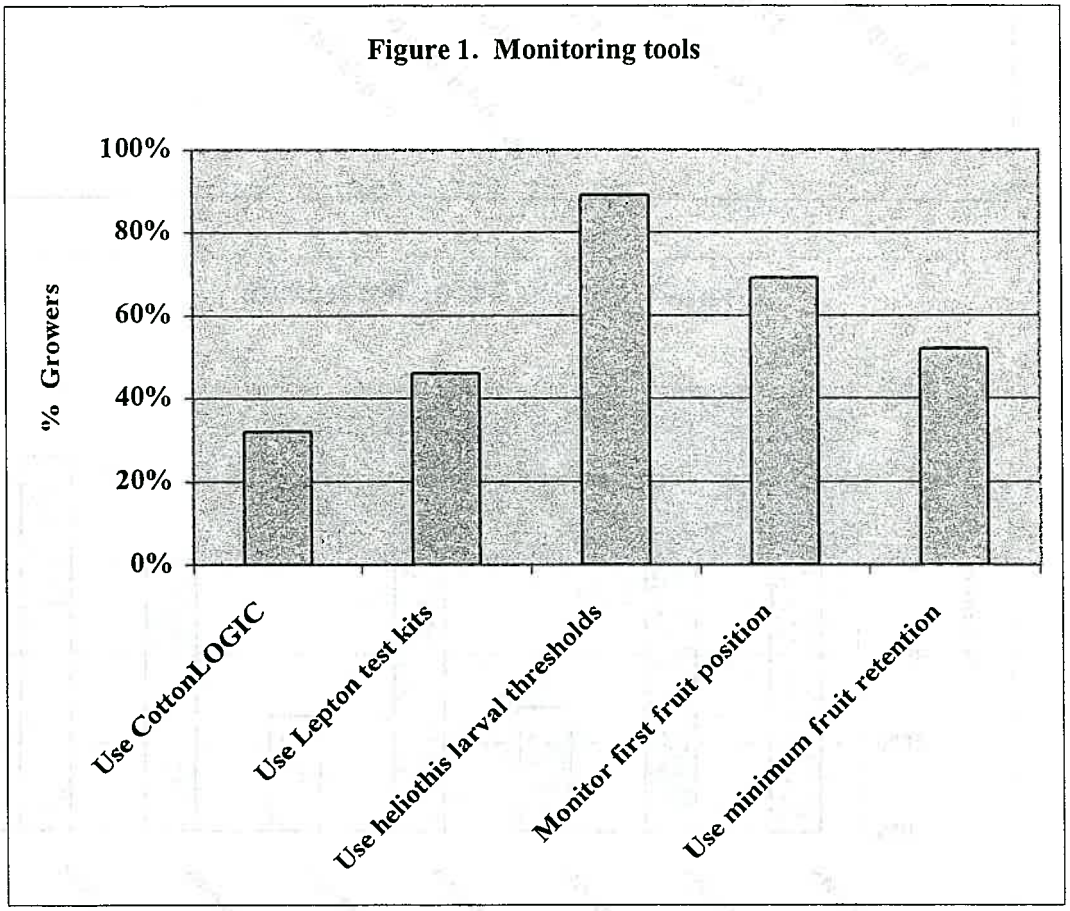


Figure 2. Thresholds

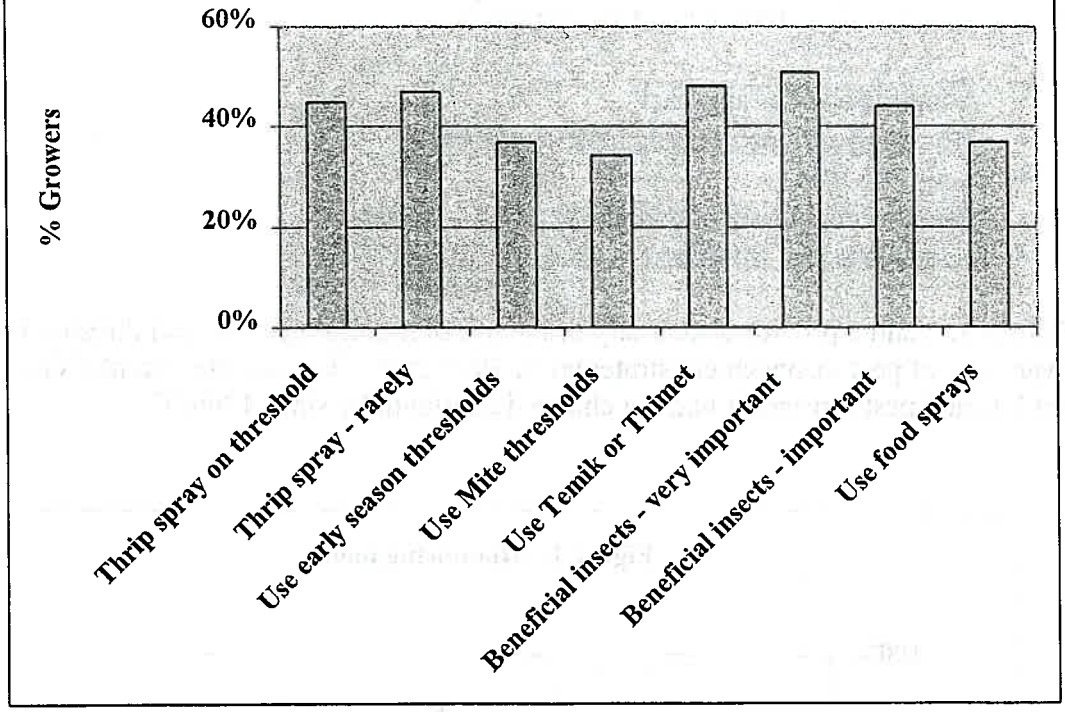
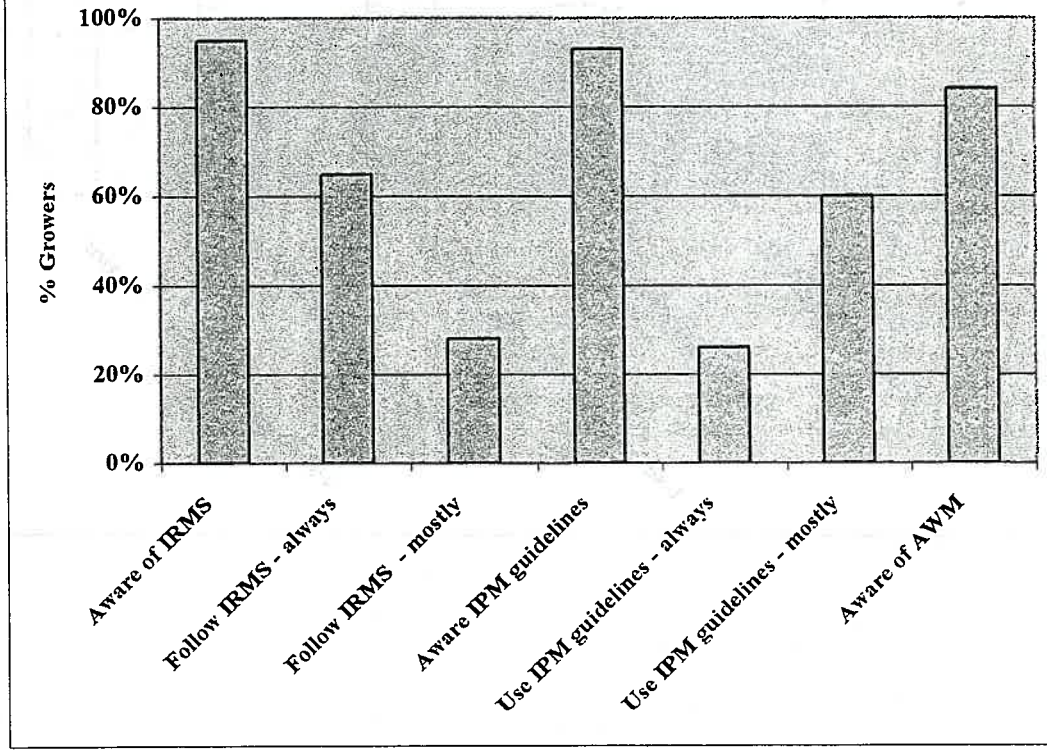


Figure 3. Awareness of IRMS, IPM and AWM



Information sources

With respect to the use of information sources in the cotton industry the preferences in ranked order are:

1. Mini field days and farm walks
2. Grower groups
3. Field days
4. Farm visits
5. District trial books
6. Training workshops
7. Newsletters and product information sheets
8. Rural press
9. Radio and TV.

Up to 68% of growers indicated a willingness to participate in nationally accredited training courses related to insect, disease, soil and farming system management.

Other key points were:

- 80% of growers had access to the internet
- 56% were aware of the Cotton CRC website
- 22% used the Cotton CRC website.

The more recent CRC Cotton Information Resources Survey has indicated that currently 90% of grower have access to the internet and 38% use the CRC website.

Profitability

Over the period from 1996/97 to 1999/2000 growers indicated that their profitability has:

- Improved for 33% of respondents
- Declined for 31% of respondents
- Stayed the same for 26% of respondents.

Research Topics

The five most important topics identified across all regions are:

1. Soft options and Area Wide Management
2. Water use efficiency
3. Disease management
4. Nutrition
5. Pesticide application by ground and drift management.

Conclusions

The Benchmark Survey has proved to be a valuable source of information for researchers and the extension team. It has helped to measure some significant trends and changes in management practices over time and has identified or confirmed key areas for further research or more focussed extension efforts. In the near future the extension team will be using and reporting on specific information from the 2000 survey in more detail.

The demonstration of improved management practice with production, environmental and community benefits provides justification for the investment of research and development funds by industry and government.

The decline in the number of respondents between 1996/97 and 1999/2000 is a clear indication that growers are discouraged or unwilling to complete large survey forms, as the benchmark Survey has become. This clearly suggests that our collection of feedback from growers needs to be changed if we are to ensure it is representative of the industry. Consequently, for the future we are likely to consider using smaller more targeted surveys dealing with specific issues rather than broad ones to reduce the burden on growers and perhaps improve the quality of the data.

Acknowledgement

We would like to express our great appreciation to the growers who have provided so much information by participating in the two benchmarking surveys. Thank you for your time and patience.

References:

Gavin Inglis and Gus Shaw, 2000. Cotton Industry Benchmark Survey: An Analysis of the Australian Cotton Industry, CRDC Occasional Papers: Extension.