

USA STUDY TOUR REPORT

Geoff McIntyre, Senior Extension Officer, DALBY

FROM: July 22nd to August 14th, 1995.

TO: United States of America

PURPOSE and OBJECTIVE OF TRAVEL

The purpose of the tour was to study and experience through participation the development and extension methodologies and practices used in the transfer and adoption of new technology in the American cotton industry by extension personnel, consultants and growers by the cooperative extension systems of the Universities and the USDA.

The objective was to seek, learn and experience methodologies and practices which have potential application to enhance the technology transfer and adoption programs of the Qld. Department of Primary Industries and the Cooperative Research Centre for Sustainable Cotton production of which DPI is a core partner. Simultaneously, cotton crop management practices, particularly those related to reduced tillage and integrated pest management, were investigated.

INTRODUCTION

This study tour was completed by Rob Eveleigh, then District Agronomist of NSW Agriculture and funded by the Cooperative Research Centre for Sustainable Cotton Production and myself funded by the Cotton Research and Development Corporation. We were accompanied by Gary Coulton, Company Agronomist of Colly Farms at Moree.

TRAVEL ITINERARY

Saturday	22/7/95	Brisbane 1.55pm to Sydney 3.20pm depart Sydney 5.30pm arrive Los Angeles 2.00pm	Qantas QF531 Qantas QF107 Hertz Hire Car
Sunday	23/7/95	Los Angeles to San Francisco	
Sunday		The Handlery, 351 Geurie St, Union Square	
Monday	24/7/95	San Francisco to Merced Dr Bill Weir, Farm Adviser, Cooperative Extension Service, University of California.	
Tuesday	25/7/95	Merced Dr Bill Weir	
Wednesday	26/7/95	Hanford and Tulare Field Day, Bruce Roberts, Farm Advisor. UC. PM Peter Goodell IPM Extension Coordinator, UC	
Thursday	27/7/95	Merced UC Westside Research Station. Cotton field day with Dr Bill Weir	
Friday	28/7/95	Merced to Corcoran Stephan Hengleler, JG Boswell Company	
Saturday	29/7/95	Corcoran to Redlands Redlands to Goodyear Ronald Rayner, Tumbling T Ranches	

ITINERARY (con)

Sunday	30/7/95	Goodyear to Casa Grande Deltapine Breeding Trials, Larry Burdett. Return to Phoenix Phoenix 8.30pm to Houston Continental Airlines Houston 2.00am.
Monday	31/7/95	Houston 7.40am Houston to Corpus Christi Continental Airlines CO 2653
Monday	31/7/95	Extension Centre, Corpus Christi JE Martocha
Tuesday	1/8/95	Extension Centre, Corpus Christi, Harvey Buehring, County Extension Agent. Corpus Christi to College Station
Wednesday	2/8/95	College Station James Supak, Professor and Extension Specialist, Cotton, Texas Agricultural Extension Service.
Thursday	3/8/95	College Station, David Rueue Stan Nemecc College Station to Thrall, Cris Sansone Blacklands Research Centre, Tom Gerik Blacklands Centre to Tyler
Friday	4/8/95	Tyler to Mississippi State University, Jac Varco
Saturday	5/8/95	Mississippi State University Will McCarty, Cooperative Extension Service, Mississippi State University. Mississippi State to Auburn
Sunday	6/8/95	Auburn University, Michael Patterson.
Monday	7/8/95	Auburn University, Auburn, Alabama Michael Patterson, JT Touchton, Dept Agronomy and Soils, Auburn University
Tuesday	8/8/95	Auburn to Morgon, Paul Wigley, University of Georgia, Cooperative Extension Service
Wednesday		University of Georgia, Research Station, Tifton. Tifton to Vienna, Chuck Ellis, University of Georgia, Cooperative Extension Service
Thursday	10/8/95	Vienna to Jackson, Tennessee
Friday	11/8/95	USDA, Tennessee Agricultural Research Centre Don Tyler, Robert Hayes, Donald Howard. Milan Research Centre Milan to Memphis.
Saturday	12/8/95	Memphis, Tennessee Visit Mississippi Delta
Sunday	13/8/95	Memphis 8.50am to Los Angeles 10.42am, Northwest Airlines NW25 depart Los Angeles 1.00pm Qantas QF118 arrive Sydney/Brisbane midnight.
Monday		
Tuesday	14/8/95	Brisbane to Dalby.

STRUCTURE OF EXTENSION IN THE AMERICAN COTTON INDUSTRY

Our tour covered most of the southern cotton states and, whilst there are some variations, the structure of the extension systems are alike.

The Nationwide Cooperative Extension System, established in 1914, is operated by the Universities in cooperation with county state and federal governments. County based extension agents offer programs in agriculture and natural resources, family and consumer sciences, 4-H and youth development, community economic development, leadership development and county government. They are supported by university specialists.

The county agents in cotton production areas have varying degrees of input into the cotton industry dependent upon the relative size and importance of cotton in the other field crops in the county. In the main they are responsible for a range of field crops and in some instance for animal production in mixed cropping and grazing areas.

The county extension agent is university employed but supported by the county government in terms of accommodation, vehicles and operating funds. As such, they are responsible to the County Agricultural Commissioner, an elected official, as well as the University.

Specialists are either campus or district based and provide extension and technical support to all or a number of county agents within the state. Subject areas include cotton, Integrated Pest Management, entomology, nutrition, soils, weed management, pathology and more.

County agents rely on the county for base operating funds but also access other funding from industry, state and federal government, grower associations and agribusiness.

Specialists are funded by the university and have access to the same range of external funds as the county agents.

Cotton Incorporated is the major national industry funding organisation. It receives levies (assessments) from growers on a per bale basis. Whilst the bulk of the funds are directed to industry promotion and product development, some of the funds are returned for research, development and extension. There are a number of other state and district based funding organisations such as the Alabama Cotton Commission, the Parry Foundation in south Texas, grower associations and seed production companies.

The county agents who hosted our visit to discuss extension and visit cotton growers were:-

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| * Dr Bill Weir | University of California, Merced |
| * Mr Bruce Roberts | University of California, Hanford |
| * Mr Harvey Buehring | Texas A & M University, Corpus Christi |
| * Mr David Reue | Texas A & M University, College Station |
| * Mr Chris Sansone | Texas A & M University, Georgetown |
| * Mr Paul Wigley | University of Georgia, Morgan |
| * Mr Chuck Ellis | University of Georgia, Vienna |

The cotton extension specialists visited were:-

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|---------------------|-------------------------------------------------------|
| * Dr James Supak | Texas A & M University, College Station |
| * Dr Will McCarty | Mississippi State University, Mississippi |
| * Dr Mike Patterson | Auburn University, Auburn, Alabama |
| * Mr Dale Monks | Auburn University, Auburn, Alabama |
| * Dr Peter Goodell | University of California, Keamey Agricultural Centre. |

We attended and participated in cotton grower field days at Merced and Tulare in California. We were unable to arrange our schedule to attend field days in other states and concentrated our efforts on the discussions with extension personnel and growers associated with property visits. The field days were well attended by growers and agribusiness people, conducted in an informal but very effective manner with considerable interaction and participation.

Field days, meetings etc are generally well supported by agribusiness sponsorship. The preseason workshops are typically funded by registration fees and sponsorship.

The specialists and county agents have high profiles in their respective districts and regions and universally enjoy a rapport and respect from the whole industry. Collaboration with agribusiness groups and chemical companies in the development and extension programs is of a high order.

Whilst overall, operational funding resources are certainly finite and limited the specialists and agents are very active and most effective with their programs. Concern was expressed in Mississippi that budget reductions will result in the loss of a significant number of extension positions.

The cotton specialists have an excellent in depth technical knowledge of the industry particularly within their states and provide very good resource support for county agents in association with the weed, insect, IPM nutrition soils and other subject specialists. Collaboration and consultation between state specialists is also very good and such that they provide an important contribution to the national industry organisation.

ACTIVITIES

The essential elements of extension methods used in all states include:-

- Producer advisory services
- On-farm trials for research, development and demonstration
- Newsletters
- Field days, tours and grower meetings
- Trial books to report district trial results
- Pre-season planning meetings or workshops
- Agribusiness collaboration

Program planning primarily relies formally on annual industry consultation at the county administrative level in conjunction with informal consultation with specialists, industry organisations, district growers and the county agents.

Pre-season activities ranged from grower meetings prior to planting in California to a three day annual cotton industry workshop conducted in Mississippi. The Alabama Cooperative Extension Service at the Auburn University conducts a two day grower workshop every two years.

AUSTRALIAN COMPARISON

The extension operations of the county extension agents in the main are very similar to our practices in Australia as used by District Agronomists in NSW Agriculture and DPI Qld Extension Officers.

The more significant differences include:-

- A lower emphasis on grower advisory services, the day to day tactical issues, in Australia which is associated with more extensive consultancy services provided by cotton consultants. In contrast, the American growers use pest control agents (PCA,) primarily as bug checkers only, although there are a few consultants providing the broader services in America.
- In some counties the county agents train, supervise and manage PCA services to cotton growers in the county charging fees of the order of \$5 to \$6 per acre which represent the full cost of the service. Pest management decisions based on the insect sampling information provided by the PCA are the responsibility of the grower.
- Australian extension officers concentrate on industry issues and strategies related to crop management and production and tend to work more often with groups and agribusiness consultants.

- Extension specialists provide state or district wide support for county agents in a range of subject areas in the USA.
- Formal consultation and program planning with district growers is more frequent in Australia and there is greater grower involvement in development and extension activities.
- Annual pre season planning meetings or workshops are not conducted regularly in Australia.

INTEGRATED PEST MANAGEMENT (IPM)

Integrated Pest Management Extension and practice was a subject of particular interest during our tour.

IPM programs vary significantly between states at least in the cotton industry, because of differing insect pest management problems. IPM programs were being actively conducted in California and Texas and to a lesser extent in other states. For those states undertaking Boll Weevil eradication programs it is very difficult to incorporate IPM practices in an environment of extensive pesticide application which is the key element of the eradication program. As these programs are successfully achieved we would anticipate more extensive use of IPM practices in those areas.

Federal and state government funding supports IPM programs in most states. The University of the California (UC) Statewide IPM project is the most advanced program which we encountered.

The Statewide IPM Project is a part of the UC Division of Agriculture and Natural Resources. The project, headed by a director, reports to the DANR Associate Vice President. An associated director for research provides liaison with IPM researchers at the various UC campuses and field stations and chairs the project's Technical Committee. The Technical Committee, made up of the chairs of each of the project's research workgroups plus key IPM project personnel, advises the project director on allocation of research funds. The Technical Committee relies to a large degree on the recommendations of the research workgroups, which represent a diversity of UC Agricultural Experiment Station and Cooperative Extension academic staff, and solicits advice from UCANR commodity workgroups.

The project has about 30 permanent staff members. The implementation staff includes seven area or regional IPM advisors situated in county or regional offices, including an extension IPM coordinator located at the UC Kearney Agricultural Centre in Parlier. The project's administrative office and all other staff are located on the Davis campus. The computer group has a manager, three programmers, a writer, and a meteorology assistant. The IPM education and publications group has a director, three writers, as assistant editor and clerical staff. Located with the education and publications group is the pesticide education program with a pesticide training coordinator, two farmworker safety trainers, and a program assistant.

Disseminating pest management information developed from university research projects is a primary function of the UC IPM Project. The IPM techniques for various regions in California. Located in key agricultural areas, IPM advisors act as a bridge linking campus-based researchers, other Cooperative Extension advisors, growers and pest control professionals. In addition to applied research, IPM advisors over the last year have been very active in hands-on training workshops for pest control advisors, pesticide applicators and growers sponsored by the UN IPM project and UC Cooperative Extension offices.

The extension program is coordinated by Dr. Peter Goodell at the UC Kearney Agricultural Centre at Parlier in the San Joaquin Valley. He leads a team of two entomologists, a weeds scientist and plant pathologist with four more positions to be filled. The project refers to all crops - horticultural and field -

and insects diseases weeds and nematodes. Vegetable production is the core area of work and Peter commits some 70% of his work to cotton.

IPM programs in the other states, notably Texas, are conducted by IPM or Entomology extension specialists and some of the county agents. A key part of the program is the provision of insect scouting services to growers. The pest control agents (PCA,) are trained and supervised by the county agents with growers paying a fee of the order of \$6 per acre for the service. The service primarily involves the field scouting and sampling by the agent. As some of the agents develop the necessary skills and an experiment may include pest management recommendations.

The insect scouting services are combined with IPM educational programs involving scouts and growers. The development of resource materials for extension personnel is a significant role of the specialists.

Extensive discussions with Dr Stan Nemeec at College Station were of particular interest. Stan conducts private crop management research having previously worked with resistance monitoring at Texas A & M University. He also provides independent crop consulting services in the district. His research includes works for chemical company according to protocols with company funding and on farm research with growers funded from profits on the crop. Stan's application of IPM principles and methodologies in his practice and his work with beneficial insects is similar to that of David Murray *et al* in Australia.

GENETICALLY ENGINEERED VARIETIES

New varieties carrying genetically engineered traits including Bt and herbicide resistance were seen in a number of states where more extensive production of such varieties will occur in 1996. All were effective and will be beneficial, having been incorporated in current commercial varieties. The management practices for commercial production were still being developed at the time.

GENERAL AGRONOMY

Reduced tillage aspects of the study will be reviewed and reported in detail by Rob Eveleigh who now works with Cotton Seed Distributors at Wee Waa in NSW.

In general, a wide range of reduced and no tillage practices were discussed with growers, researchers and extension personnel. Whilst some techniques may have application in the Australian cotton industry, there are limitations to its direct application because the USA systems have been developed in high rainfall, steeper sloping regions on light, highly permeable and erodible sandy soils. That contrasts with Australian cotton production areas of lower rainfall, flat plains apart from Central Queensland and heavy clay soils.

Other agronomic and insect management practices and strategies were also discussed. They have contributed to a better knowledge and understanding of the American industry on our part.

CONCLUSIONS:

Our study tour complements very well the recent CRDC/CRC Cotton Extension Review conducted in Australia by a panel which included Dr. James Supak of Texas A & M University at College Station. We strongly support and endorse the recommendations of the Extension Review.

Recommendations based on our study include:

- District extension officers such as country agents have key strategic roles in the industry extension and the transfer of new technology.
- District extension staff with mixed responsibilities to a number of industries can contribute to the cotton industry on specific local issues and can provide a integrated farming systems approach with their role across industries.
- District trials and demonstrations are important in the local evaluation of research. The local adaptation development and demonstration of research findings is critical to the adoption of improved practices.
- Current in season extension activities such as field days, farm walks, newsletters, trials and demonstrations are endorsed and could be expanded with appropriate further technical support for extension officers as occurs within Program 4 of the CRC for Sustainable Cotton Production.
- Pre season industry seminars or workshops involving growers consultants and agribusiness to review the past season and preview the next could have a significant beneficial effect particularly to review and promote the adoption of industry goals whilst anticipating and addressing particular local issues. District research, development and extension needs can be assessed and prioritised in collaboration with growers, consultants and agribusiness personnel.
- Extension support from industry specialists especially in subject areas such as IPM would contribute to a coordinated approach ensuring consistent messages are being delivered throughout the industry and provide the essential technical support for district extension officers.
- A national extension specialist in the industry would help extension personnel in their development of extension strategies, coordination and social research. However, more extension officers would be a priority at this stage.
- Integrated Pest Management (IPM) needs to be addressed across all industries if it is to be successful. Whilst the cotton industry can provide a lead it requires the support of other industries particularly the grain industry.
- Opportunities for district grower groups to fund specific district projects need to be assessed.
- The publication of district trial booklets and the formation of district grower and industry trial and development committees is strongly endorsed.

RECOMMENDATIONS

Our study tour confirms that the Australian cotton industry extension program coordinated under the CRC Program 4 is well structured and well organised and should continue to develop according to the Cotton Extension Review findings and recommendations. Our study complements the review very well and I believe we can establish a highly cooperative and strongly integrated extension program involving all sectors of the industry. There are opportunities to adapt some of the extension activities seen in the USA such as the district pre season workshops or seminars in the alternate years to ACGRA Research Conferences.

ACKNOWLEDGEMENTS

I wish to gratefully acknowledge the support of the Cotton Research and Development Corporation for this USA study tour which has been of great benefit both to industry, the Department of Primary Industries and myself. My thanks to Rob Eveleigh and Gary Coulton for thier company and support on the study tour.

I am most appreciative of the support from our hosts throughout the cotton states of the USA. We were made very welcome and offered many opportunities to visit extension personnel and to see many of the cotton production regions.