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NSW Regional Extension Final Report

Background

The 'Regional Cotton Extension Officer' has played a key role in improving the uptake of research within the Cotton Industry by jointly working with the Cotton Catchment Communities Cooperative Research Centre (Cotton CRC) and the NSW DII. This position is a critical component of regional delivery, and is about delivering local outcomes within a national framework.

The Regional Cotton Extension Officers work with producers, industry and partner organisations to achieve 'on-ground' outcomes through the development of collaborative activities and partnerships.

Objectives

The Regional Cotton Extension Officers work with producers, industry and partner organisations to achieve 'on-ground' outcomes through the development of collaborative activities and partnerships. The roles of these positions, based in the Macquarie Valley and in Southern NSW, are to identify and facilitate the adoption of industry best practice by developing networks and building industry capacity to improve profitability of the NSW Cotton Industry.

The Regional Cotton Extension Officers provided a key role in improving the uptake of research within the cotton industry by jointly working with the Cotton Catchment Communities Cooperative Research Centre (Cotton CRC) and I&I NSW.

Objectives were to develop, promote and implement a regional, grower focused extension program which addressed cotton industry issues, promoted industry uptake of emerging technologies and management strategies that contributed to increased productivity, profitability and sustainability.

Methods

These positions are part of the Cotton CRC National Cotton Extension Team. The team worked on an industry-wide scale and took a knowledge management approach to deliver grower focused adoption and extension programmes.

Extension officers needed to communicate and collaborate extensively with a range of stakeholders and form a central link between research and extension staff, industry specialists, regional Cotton Growers Associations, industry bodies, Regional NRM Bodies and cotton producers.

NSW Extension Officers undertook, facilitated or coordinated a range of research, extension and training activities in conjunction with key industry team members and stakeholders to achieve 'on-ground' outcomes and adoption of emerging technology. The adoption and extension programme

delivery involves participative learning processes with both grower groups and individual growers including workshops, meetings, on-farm trials, demonstrations, integration of Decision Support Systems (DSS) tools, field days, publications and other innovative adoption tools.

Two key challenges of these roles are the establishment of successful relationships with growers, researchers and industry stakeholders to enable the project outcomes to be achieved and the development and implementation of effective extension strategies that result in the adoption of more effective and efficient technologies and management strategies in cotton production.

The two extension officers involved had a well established rapport with local industry due to prior experience in the regions. Both officers had worked on farms and as consultants in the areas. This helped with access to both growers and industry.

Results

The project commenced in 2007 inclusive of two regional extension officer positions, the Macquarie Valley based at Warren and in Southern NSW (Lachlan & Murrumbidgee) based at Hay.

The extent of achievement against each of the objectives was constrained by the severe and ongoing drought conditions experienced with zero general water allocations in all valleys since 2007 to the completion of the project.

Outcomes

Various strategies were utilised to work towards achieving 'on-ground' change and are detailed below.

Trials

The number of trials undertaken during the project was limited due to the reduction in cotton areas planted. The following trials have taken place during the time of the project.

Disease

Bion® Trial. Bion® is a registered seed treatment developed by Cotton Seed Distributors and Syngenta Crop Protection that has shown to be effective in the control of Fusarium wilt and Black Root Rot in cotton. Both these seedling diseases occur and contribute to production losses in both the Macquarie Valley and Southern NSW.

This trial was conducted in conjunction with Cotton Seed Distributors. The aim of the trial is to investigate the effectiveness of Bion® in reducing the severity of Black Root Rot on cotton seedlings in a field with very high levels of Black Root Rot inoculum. A replicated trial was established comparing Bion® treated and untreated seed in the Macquarie Valley.

IPM Cruiser® Trial. A replicated trial was established in conjunction with Cotton Seed Distributors and Syngenta Crop Protection. The trial compared Cruiser® at standard rate, Cruiser® at double rate, Cruiser® at triple rate, Temik® at standard rate and a control (no treatment). This illustrated to growers various early season insect control.

Green Mirid Trial. Green mirids are an insect pest of cotton found in all cotton growing regions that have the potential to reduce yield by feeding on squares and bolls of the cotton plant. Their importance as a cotton pest has increased since the introduction of Bollgard® cotton as previously most chemicals which controlled Heliothis also controlled the Green mirid. Pheromone lures that attract the adult male have been developed and are being trialed across the cotton industry as a potential monitoring tool of field populations of mirids.

Results from the mirid pheromone trapping trials in 2007/08 were inconclusive in that the pattern of pheromone trap data was not consistent in all the trial sites. Current data suggest that pheromone traps on their own might not be reliable monitoring tools to indicate presence or absence of mirids in the field. Nevertheless, they could be valuable tools for studying the population dynamics of mirids, hence a better understanding of mirid ecology.

Insect Pest Sampling

Extension officers assisted each season with *Helicoverpa* egg and larvae collections for resistance testing.

Samples of mites with suspected Agrimec resistance were collected and sent to Grant Herron, NSW DPI, for testing.

Inspection of crops for SLW was carried out toward the end of the 2009/10 season as a result of other cotton growing valleys seeing an increase in SLW numbers.

Farming Systems

Row Space (15inch)

Row spacing has always been an issue in the southern region. A row space trial was carried out at Hillston comparing 15inch and conventional row spacing with various management inputs and varieties. Activities included regular monitoring including plant mapping, bio mass recording, nutrition tracking and soil moisture monitoring. Data was used to carry out a full economic analysis of the 2 systems as there is additional costs involved in growing 15 inch cotton.

The aim was to try and determine whether it is advantageous to grow 15 inch cotton in the south. The trial provided information on water use for the 2 systems, plant physiology and economic differences. The site was used for various field walks for new and prospective growers to be able to evaluate the system for their own farm.

The trial was very important as it demonstrated that there was not a significant advantage to be gained from growing 15inch. More significantly it demonstrated that the crop physiology was different in the 2 systems and therefore it was demonstrated that the 15inch system was not in fact shorter in regards to maturity.

A publication titled 'Review of High Yielding Crops 2006/07' has been completed for the Macquarie Valley. This review was published in the Macquarie Valley Trial Book for 2004/05, 2005/06 and 2006/07. The review establishes current benchmarks for the highest yielding crops in the Macquarie Valley in 2006/07 and provided a best management practice base for the Macquarie Valley which can be used to assess future practice change and production outcomes. It also promotes current best practice in the Macquarie Valley to all growers, consultants and other industry people.

Nutrition

NUE

Increasing nitrogen (N) fertiliser costs and increased focus on greenhouse gas emissions have prompted greater attention to the efficient use of nitrogen fertilisers. These issues and the need to optimise fertiliser inputs to meet crop requirements have also increasingly been identified as priorities in feedback from cotton growers and consultants. The National Nutrition Priority Team designed a Nitrogen Use Efficiency (NUE) monitoring program to be conducted across all cotton growing valleys to gain some understanding of NUE in the cotton industry. The monitoring program involved on farm NUE trials and grower questionnaires regarding their nutrition monitoring. Various NUE monitoring sites were established in the Macquarie and in the Murrumbidgee area over the 2007/08, 2008/09 and 2009/10 seasons. Data was collected from these sites during the growing season such as N applied, tissue tests, dry matter cuts, soil N tests and yield data. The survey that accompanies these trials was conducted with each of the participating growers.

Results from the NUE benchmarking conducted during 07/08 show that, on average, the sites monitored had 50kg/ha too much N applied. This suggests the industry can safely reduce fertiliser inputs by 15-20% without affecting yields. Further communication of this work is required to improve NUE across the industry.

Field Walks

A number of field walks were held as both growers and consultants liked the well timed and hands on nature of this type of meeting. Most field walks were timed with an activity i.e. planting, were informal and quite short in length.

Field walks included-

- Cruiser® trial site inspection (early December 2007).

- Field walk looking at biological fertilisers and soils amendments such as manure, compost teas and other organic amendments. Researchers attending were Oliver Knox and James Quilty. Designed to be a small group of irrigators who are currently using, or interested in using, biological soils amendments/fertilisers to encourage interaction and knowledge flow between the growers and researchers. Growers and consultants had an opportunity to discuss the issue directly with a researcher, improving their understanding of soil biology. The group that attended the field walk now have plans to implement replicated trials on their properties to more accurately measure the outcomes of using alternative fertiliser sources.
- Lateral move irrigator field walk.
- Macquarie River Food and Fibre (MRFF) book launch of "The Macquarie Marshes: An Ecological History" on the 26th September at "Burrina" in the Macquarie Marshes.
- CW CMA and Sustainable Soils Management (SSM) Groundwater Field Day held at "Wambandry" Warren on the 10th October.
- Pre planting farm walk 13/9/07 held with 15 people attending including 11 growers, 2 consultants and 3 industry people including Craig McDonald of CSD. The aim of the day was to discuss pre irrigation vs watering up, wire worm control, BMP and planter set up. The idea of the Pre plant workshop was to demonstrate to the growers and potential growers the issues associated with planting. One of the discussions revolved around pre irrigation verses post irrigation or watering up. At the day I presented the advantages and disadvantages of both systems so that the growers had a good understanding of the consequences of both methods.
- Crop emergence farm walk 1/12/07 held with 15 people attending including Guy Roth, Cotton CRC CEO. Topics covered included pesticide application management plans (PAMP's), 1st RR application, emergence issues and 1st irrigation.
- IPM short course with Mark Hickman on the 5/12/07.



IPM Field Walk with Mark Hickman

- Cut out PIX field day to increase knowledge of why the crop is cut out and the effects of timing on maturity and harvest date.
- Defoliation workshop demonstrating various methods of determining crop maturity and timing of defoliation.
- The annual Southern Cotton Field Day was held at Whitton SE of Griffith.
- Lachlan and Murrumbidgee Cotton Grower Association Harvest farm walk to run through the various activities associated with picking.
- The MCGA Macquarie Valley Cotton Field Day was held on the 18th March 2008. Attended by 50 growers, consultants and industry members. Topics included varieties, IPM, soils management, alternative irrigation methods, and managing for fibre quality. Presentations by visiting researchers Mike Bange and Lewis Wilson.

- Defoliation field walk aimed at new and potential growers in the Murrumbidgee area on 20/3/2008.
- An Insect and Weeds Research Update Field Walk was held on the 17/11/08 at Buddah Station, Narrabri. The field walk involved looking at CSD seed treatment trial, discussing new products in the pipeline for IPM with Robert Mensah and weed management in a Roundup Ready Flex system with Graham Charles
- Insects and Weed – Walk with the researchers (18/12/08) @ Peter Booths farm.
- Cut out/crop maturity farm field walk at Bundarra Farms, Goolgowi 28/1/2009.
- Soil ameliorants held at “Riverview”, Hillston 12/3/2009. Phd students James Quilty and John Bennett (Sydney University) outlined to growers research work looking at Gypsum / lime and soil ameliorants.
- A field walk was held at Auscott, Warren 19/3/09 on alternative cotton nutrition using vetch and chicken manure, soil and water management in standing wheat stubble, variable rate pix application and weedseeker spray technology.
- Southern annual cotton grower field day on 8/4/09 at Hillston.
- The annual MCGA valley field day was held on the 31/3/09. Following consultation with the local industry, the field day was shortened to a half day with 2 stops, focussing on 2 major issues, rather than trying to cover a number of issues. The day focussed on spray drift with a presentation from James Houlahan (Cotton Australia) and nutrition at the N6 trial site. Information was presented by Sally Ceeney and Matt Ward (consultant). A visit to the CSD variety trial site was also included. The field day was well attended with approximately 40 people, primarily agronomists and some growers.



Cut out field walk

Feedback

The growers like the practical nature of the field walks. Grower's quotes include "very practical and worthwhile continuing" and Mark Zanatta one of the local consultants stated that the defoliation workshop was one of the best hands on days he has attended.

Workshops

IPM

A Mirid Meeting was held on the 25/11/09 for Macquarie and Sth NSW. Information presented by Lewis Wilson on mirid management, IPM and risk of SLW in these regions. Meeting was well attended by 12 key consultants from both regions.

Insects and Weeds

The day was held to introduce growers and industry people to the researchers and to give the researchers opportunity to discuss their projects. Dr Robert Mensah (NSW DPI) Graham Charles (NSW DPI) presented at the meeting, attended by 2 local agronomist, 2 growers and 2 industry people. Southern Regional Cotton Extension Officer had positive feedback from the day.



Nutrition

The Healthy Soils Regional Forum was held at Hillston on the 13th November as part of the Healthy Soils for Sustainable Farms program. Growers and consultants from Hay, Griffith and Hillston were encouraged to attend this forum as the information presented would be relevant to their soils. The event was promoted in Cotton tales and local media, in addition local growers recieved emailed and phone calls to encourage attendance. The forum was attended by 55 people, mainly growers and consultants. During the day there was 14 presentations made by research and extension staff. Improved industry awareness of how to manage for healthy and productive soils. The forum provided a great introduction to the cotton industry to at least 10 prospective growers. The forum provided an opportunity for links to be developed between potential cotton growers, existing growers, industry, consultants and the researchers.

Hands on Research Session at the 14th Australian Cotton Conference on Nitrogen Use Efficiency and Alternative Approaches was facilitated by the Macquarie Cotton Extension Officer. A total of 3 sessions were conducted with approximately 65 attendants, made up of growers, consultants and other cotton industry members. The focus of the session was to highlight the importance of monitoring for NUE using soil and tissue testing and the message of applying 'smaller amounts more often' to optimise efficiency. The session also highlighted the importance of knowing what was actually being applied to the soil when using alternative fertilisers and how to conduct on farm research to assess the impact of these alternatives.

Soil Testing Workshop

James Hill (Southern Regional Cotton Extension Officer) organised & attended the Soil Testing workshop at Hillston on 4/11/2008.

Growers and managers gained a hand's on understanding about all facets of soils testing. The meeting was attended by 4 of the 8 Hillston growers or 65% of the crop in terms of area. Growers appreciated the relevance of the course to their actual operations.

Water

A Groundwater Workshop was delivered in Narromine 29th April 2008. The workshops were delivered by the Cotton CRC and led by Dr Wendy Tims of the University of NSW Water Research Laboratory. The workshop was attended by approximately 20 people, mainly growers with bore water

allocations. Growers and consultants who attended were given information on how groundwater systems work and how to effectively monitor their own local groundwater levels and quality. Promotion of the importance of sustainable groundwater system use in the cotton industry and the protection of the quality of groundwater.

Ground water workshop held at Hillston on the 1/5/2008. Growers and their staff were able gain an understanding of how the local ground water system works through a combination of theory and practical demonstration using a model.

This meeting was attended by 8 growers and staff. Ground water is a very important issue regionally with the whole area reliant on ground water. A major part of this workshop was based upon a demonstration of a ground water system model which growers liked as it was a very practical demonstration of how the system works. One grower stated that the day was a “good combination of theory and practical”.

The Macquarie extension officer assisted in the coordination of the Central West CMA and Narromine Shire Council Watersmart Expo 31st Feb – 1st Mar. The Expo featured seminars, field trips and trade displays in all areas of rural and urban water use efficiency.

Growers and consultants heard seminars on the latest research in irrigation management such as alternative systems e.g. drip and bankless channels. Grower case studies were used and there was a focus on looking at the economics of different systems. Growers who attended will have an increased knowledge of the different types of irrigation systems, scheduling tools and evaluation programs available to help them make more informed decisions on how to best use the water available to them. Impact: Enhanced collaboration between the Cotton CRC, Central West CMA and Narromine Shire Council.

Sally Ceeney helped coordinate the CW CMA Watersmart Expo in Narromine 6-7th March 09. In particular, a session was coordinated by the officer titled “Getting the most out of water – farming and rotation systems to generate profit.” Speakers at the session were John Lacy, NSW DPI “Growing 10tonne irrigated wheat”, Chris McCormack, Agronomic Business Solutions “Benchmarking for profit” and Brett Cumberland, Buddah Stn, grower case study on growing rotation crops.

Despite the CMA promoting this expo extensively in the local region, attendance was not high.

The following courses have been delivered in the Macquarie during the reporting period:

Centre Pivot Lateral Move Irrigation Workshop 5-6 August in conjunction with NSW DI&I water staff

Surface Irrigation and Evaluation 7 August in conjunction with NSW DI&I water staff

Drip Irrigation 3 Dec in conjunction with NSW DI&I water staff

Each workshop was well attended with over 25 growers attending in total (some attended more than 1) and receiving information on how to improve their irrigation systems. All of these growers are currently putting together a proposal for the Irrigation Modernisation Scheme so have used this information to help design their on farm plans. Depending on the outcome of the proposals, it is possible that many will be able to implement the changes to improve WUE on their farms.

Farming Systems

A Bourke Summer Cropping Meeting was coordinated by the Macquarie Cotton Extension Officer 22/08/08. This meeting was held to discuss summer cropping options in the Bourke district in 2008/09 and present the latest research information. The meeting also involved partner organisations NSW DPI and other industry representatives in presenting information on summer rotation crops including corn, sorghum, soybeans and mungbeans. The meeting was attended by the majority of Bourke growers, managers and agronomists. Feedback from the meeting was that it was great to get a good overall refresher in summer crops since they had not grown one in a few years. It was also seen as a good opportunity to keep up to date with the latest research, varieties etc.

Climate Change

Presented at the Bourke Climate Change Forum hosted by the Western CMA and NSW DPI on the 14th November on “Climate Change and Cotton”. The event was attended by 70 people including irrigators, farmers, graziers, researchers and Western CMA and NSW DPI representatives.

This forum provided information on the impacts on climate change in the Western CMA catchment. The presentation given on climate change and cotton was based on research conducted by Mike

Bange, Guy Roth and David McRae and highlighted some of the possible impacts and management options for the effects of climate change on cotton in the western areas.

Spray Application

James Hill (Southern Regional Cotton Extension Officer) co-ordinated and attended a Spray application workshop at Hillston on behalf of the Lachlan and Murrumbidgee Cotton Grower association presented by Bill Gordon (Bill Gordon Consulting).



Growers observing practical demonstration @ Bill Gordon Workshop.

Two Spray Application Technology and Spray Drift Management Workshops were coordinated by the Macquarie Extension Officer in conjunction with Bill Gordon Consulting, MCGA and Nufarm Australia on the 3/09/08 (Warren) and the 5/09/08 (Narromine)

The workshops were well attended by spray rig operators. Feedback from attendants:

- “I am now better informed to make smarter spray application decisions, not just to reduce drift but also to make sure I am using the right rig set up to ensure I get the best spray job”
- “I’ll certainly be making some changes to me spray operation – especially to the nozzles I have been using”!

Publications

The article ‘Monitoring nitrogen use efficiency in cotton crops’ by Ian Rochester (CSIRO), Sally Ceeney (NSW DPI), Susan Maas (QDPI), Rod Gordon (formerly QDPI), Lauryn Hanna (NSW DPI) and James Hill (NSW DPI) was published in the Australian Cottongrower April-May 2009, Volume 30. This article also appeared in the Autumn 2009 issue of Spotlight.

Increased grower awareness on current industry research on NUE, implications of poor NUE and ways to improve NUE. Also Highlighted extension activities and the link between extension and research.

Macquarie Valley Trial Book 2004/05, 2005/06 & 2006/07, compiled by S Ceeney

Macquarie Valley Cotton Trial Reports 2007/08, compiled by S Ceeney

Over 50 regionally targeted Cotton Tales newsletters were produced and distributed during the project period covering all aspects of cotton production, promoting production improvements in areas such as NUE, WUE and IPM.

Benchmarking

Regional production information had been benchmarked since the 0607 season through crop competitions and the Review of High Yielding Crops. One of the main focuses of extension activities in the Macquarie region, and nationally, has been improving nitrogen use efficiency. Local data on nitrogen use has been benchmarked through these activities and also through the nationally conducted benchmarking trials. Extension material on improving NUE has also been produced during this period including Cotton Tales articles, Soils Symposiums, Cottongrower articles, field walks and field days (all reported on throughout this report). Data from the review of High Yielding Crops and crop competitions shows that growers in the Macquarie have been applying similar amounts of N each season, since 0607; between 180-220kgN/ha but the way in which they are applying it has changed. In 0607, on average growers were applying 63% of their N requirements up front with the remainder (37%) applied in crop. In 0708 this was reduced to 37% up front and in 0809 this was again reduced to 20% of N requirements being applied up front. This data set includes approximately 6 of the best performing growers in the valley each season, of which many of them are involved in all 3 seasons' data sets. While the total amount of N applied has remained similar over this period, growers are now applying less N up front and more in crop. Feedback from these growers is that it is primarily to reduce nitrogen losses and to provide N when the crop requires it during the season.

Impact

A representation of top performing growers in the Macquarie show a change in management practice toward reducing their upfront N application to reduce nitrogen losses, improve yield and improve nitrogen use efficiency.

Additional Roles

Macquarie Valley

- Cotton CRC Sub Program Leader for Regional Extension

The Macquarie Regional Extension Officer was appointed the Cotton CRC Sub Program Leader for Regional Extension in February 08. This leadership position is a great opportunity to provide drive and direction the regional extension team.

- Soil Biology Grower Group Field Trip and Researcher Visit

A group of growers in the Macquarie with an interest in soil biology and improving soil health has been formed. A visit by soil biologist researcher Oliver Knox was organised to give the growers an opportunity to discuss soil biology issues. The group visited two farms in the Macquarie using alternative fertiliser sources. PhD student James Quilty also attended the day. The group is looking to work together in the future to discuss ideas and run field trials to assess the use of alternative fertiliser sources with the aim to improve soil health and improve farm profitability, productivity and sustainability.

- Cotton CRC Leadership Course

The Macquarie Extension Officer attended the Cotton CRC Leadership Course. This was a great opportunity to learn more about leadership, particularly in terms of team leadership and different leadership styles. The course was also focused towards improving team learning. This will be of great relevance to assist with the positions of Project Leader for NSW regional extension and Cotton CRC Sub Program Leader for Regional Extension. The team learning part of the course will also be very beneficial to how the officer works as part of the regional extension team and the wider NCET.

Researcher interaction

There was regular interaction with relevant researchers so as to deliver and maintain the delivery of cutting edge research to growers and industry. Examples of this include:

- A day was spent at ACRI on the 24/07/07 to meet with researchers and here what research they were working on.
- Attended the Cotton CRC Science Forum 8-9/08/07. This two day forum brought together over 200 researchers, students, extension staff, research managers, growers and consultants from across the cotton industry. It was an opportunity to hear the latest research and interact with researchers over the two days.
- Attended the CRDC final report presentations on the 29/08/07.
- Coordinated a visit by researchers Oliver Knox and James Quilty to discuss soils biology and biological soils amendments/fertilisers with local growers.

- Consulted with researcher Greg Constable to develop a Cottontales article on cold shock (Cottontales No. 26/10/07).
- Consulted with researcher Mike Bange and Guy Roth to understand the potential effects of climate change on cotton in order to give a presentation on the subject to the Western CMA and NSW DPI Climate Change Forum held in Bourke.
- Regular contact with Ian Rochester through phone and email to discuss NUE trials and general cotton nutrition.
- Assisted David Nehl and Chris Anderson with the Macquarie disease surveys (12/11/07). Organised for them to visit another farm in the Macquarie with cotton badly infected with Black root rot and seedling disease to discuss disease management options for that grower and consultant.
- Regular contact with Alice delSocorro through phone and email regarding the mirid pheromone trial.
- Meeting the researchers at ACRI.
- Attended the Cotton CRC Science Forum at Narrabri where each of the researchers had an opportunity to outline each of their projects.
- Regular meetings with Rose Roche to discuss and carry out crop inspections at the row space trial site at Hillston.
- Continued contact with Ian Rochester regarding the N efficiency trial and grower queries.
- A Physiology Research Group Meeting was coordinated by the Macquarie extension officer as part of the National Nutrition and Physiology Priority Team. The aim of this meeting was to let the researchers know about the team and its activities and to start to work with the group to develop extension activities in the physiology area.
- As part of the Nutrition and Physiology NPT, the Macquarie Extension Officer has regular attendance at the Nutrition Research Group Meetings. These meetings discuss what research is occurring in the field of nutrition and what extension activities should be occurring.
- Regular contact occurs with Ian Rochester through the national NUE trials and also as a member of the Nutrition and Physiology NPT.
- Regular contact has occurred with Alice del Socorro and Dr Peter Gregg through the mirid pheromone trap trial.
- Following the NCET in May, a Regional Extension Officer Technical Update was held. Presentations were given to all the regional extension officers by various researchers including QDPI entomologist team, QDPI pathology researchers Lynda Smith and Linda Swann, Mike Bange, Kaara Klepper and Moazzem Khan.
- A Cotton Tale on Water logging in cotton was written with assistance from Ian Rochester
- The MCGA cotton field day featured talks from Mike Bange on managing for fibre quality and Lewis Wilson on IPM in cotton.
- Assistance with the coordination of a local trial site for Nilantha Hulugalle looking at carbon sequestration in different cotton farming systems.
 - Extension Officer met with Dr Rose Roche and Dr Mike Bange (Australian Cotton Research Institute, Narrabri) in new grower's crops to discuss research relating to cotton earliness on the 11/2/2008.
 - James Hill (Southern NSW Cotton Extension Officer) met with Michael Grabham (PhD student working with CSIRO and NSW DPI) and Roger Commin's of Commins partnership where irrigation monitoring trials are occurring.

Interaction with relevant researchers has occurred on a regular basis via:

- Attendance at the 14th Australian Cotton Conference. Opportunity to hear talks on the latest research findings and interact with researchers via coordinating the Hands on Research Session – NUE and alternative approaches.
- Attendance at the Cotton CRC Science Forum
- Attendance at the Narrabri CRDC final report presentations
- Field walk Insect and Weeds Research Update with Robert Mensah and Graham Charles
- Regular interaction with Ian Rochester in coordinating the 2008/09 NUE trials and in compiling the results from 2007/08
- Interaction with Graham Charles in developing and field testing the Strategic Management of Weeds in a Roundup Ready Flex System using the critical period for weed control threshold
- Coordinating with David Perovic in locating regional sample sites for his research
- Interaction with Mike Bange through using the Ozcot model to run simulations on late planted cotton in the Macquarie
- James Hill (Southern NSW Cotton Extension Officer) organised for Dr Robert Mensah & Graham Charles to talk to growers on farm about their latest research.
- The extension officer attended the Australian Cotton Conference and listened to researcher presentations.
- The officer had contact with Rene Vandersluis through attendance at the Field to fabric training course.

- Organised with Chris Dowling to conduct soil testing workshop at Hillston.
- Mike Bange provided feedback for a cotton tale on fibre quality specifically aimed at southern growers.
- Southern Regional Cotton extension officer organised James Quilty & John Bennett to talk at soil ameliorant field walk.
- Regular interaction with Ian Rochester through helping coordinate the regional NUE benchmarking trials
- Interaction with Ian Rochester and Nilantha Hulugalle in producing a Cotton Tale on vetch, running a field walk looking at vetch and assisting a grower determine the amount of N fixation that would have occurred from a vetch crop and general management of that crop.
- The extension officer was a key contributor to the updated Rotation Poster, which involved interaction with a number of researchers across a range of disciplines
- As the soils focus group coordinator for the new BMP content, the extension officer has had regular interaction with researchers in the soils and nutrition area.
- The extension organised a visit for all regional extension officers to ACRI on the 16/12/08 for a technical update in some particular areas of research. Extension officers met with Mike Bange, Graham Charles, Ian Rochester, Nilantha Hulugalle, Greg Constable and Janine Powell. This gave an opportunity for extension officers to become more familiar with particular researchers work.
- Worked with Graham Charles, Steve Walker, Jeff Werth, David Thornby and Todd Green to produce information on glyphosate resistance and integrated weed management for the 2009 Trade Show.
- Interaction with researchers has occurred via the following
 - Tims Roadshow
 - Attendance at REFCOM 11/08/09
 - Mirid Meeting with Lewis Wilson
 - Establishment if vetch trial with Nilantha Hulugalle and Ian Rochester
 - Working with Ian Rochester on the NUE benchmarking
 - Attendance at CRC Science Forum and Cotton Collective Week
 - Working with Mike Bell (QDPI) on P and K nutrition trial
 - Coordinating sample sites for monitoring pigeon pea trap crops with Colin Tann
 - Currently working with insect and physiology staff in developing an industry wide IPM plan



Field day presentations on farm

Conclusion

The regional extension positions were part of the Cotton CRC National Cotton Extension Team which has worked on an industry-wide scale to take a knowledge management approach to deliver grower focused, participatory adoption and extension programmes.

Both NSW Extension officers became well established during 2007 having initiated and conducted a broad range of extension activities according to well developed regional and national extension plans. Regional priorities and needs were identified, prioritised and incorporated in work plans in collaboration with growers, consultants and other extension officers.

The extent of achievement against all objectives has been hampered by the on going severe drought. In addition impacting on the effectiveness of the role has been the uncertainty of the ongoing nature of the positions over the last 12 months.

Both extension officers applied a range of extension delivery methods during the time. However, they both experienced considerable difficulty in engaging significant numbers of growers given the dry season which, combined with low prices for cotton and higher grain returns, resulted in significantly reduced cotton plantings in both regions.

There is a challenge for stronger engagement with growers, consultants and agribusiness in the regional extension program.

As previously mentioned there was also reduced trial work due to the smaller areas and associated issues. Growers were less likely to want a 10ha trial when only growing 100ha due to the extra work associated with set up etc. An example of this is the row space trial that could only be run on a corporate farm where there are more resources in place. This trial was significant to the region as it answered a lot of questions and it has been of particular benefit to newer growers in the area. However a lot of growers have their own priorities in terms of trials and therefore they concentrate more on these activities. Whilst there can be opportunities to become involved sometimes there might be commercial partners who would prefer to keep the information confidential in the early years.

Essentially most growers pay an agronomic consultant to assist them with growing their crop and therefore due to this growers depend on their consultant for information. This is especially the case for established growers. New growers require more general information and therefore they do tend to rely more on extension services.

The most well attended activities were the hands on practical activities held on farm that ran for a short duration eg planting workshop with practical demonstration. In terms of workshops growers once again liked the practical ones where the workshop actually provided them with information pertaining to a decision that might have been pending in terms of their business unit. A great example is the lateral move course that provided growers with reasons for why they should perhaps set one up, and also the issues assisted with the technology.

Extension activities in benchmarking regional production information and trends, such as the Macquarie Valley Review of High Yielding Crops, were also well received by growers and consultants in providing valuable resource information for growers to benchmark their performance against.

In terms of adoption one of the highlights for this region is the gain's in earliness attributed to field walks and discussions based on crop cut out. This idea is now leading to trials to be conducted into the future that will most likely only benefit growers in the south due to the unique growing conditions of southern NSW.

The implementation of industry BMP provides an ideal framework in which to deliver these strategies in collaboration with the Cotton Australia Regional managers. The existing strong partnerships with consultants and agribusiness must be maintained and enhanced.

There is also potentially a 500% INCREASE in area in southern NSW mainly made up of new growers across a very large region which may create new challenges for the industry!