Innovations in high yielding cotton cultivation: The Australian experience

1962, Australia

1940s, California
Yield Improvements

Chart: Australian grown cotton Sustainability Report

16 bales/ha (3.6 t of lint, 8.25 t seed cotton) crop
Merah North, Australia, 2015
Management x variety

The importance of management

Response of DP 16 to improved management

Chart courtesy Shining Liu
CSIRO
The importance of management

![Graph showing world average yield comparison between 1998 and 2009]

Where does high yield come from?

Better adapted local, disease resistant varieties
Improved soil management
Improved water management
More effective pest control
Improving soil management

Understanding the role and benefits of rotation crops
Understanding the impact of soil compaction
Autosteer GPS guided tractors for 2.5cm precision passes
Roundup Ready cotton and fewer machinery passes
Stopping stubble burning

Improving irrigation management

40% increase in water productivity over past 10 years

Source: Roth et al. 2013 Crop and Pasture Science Journal
Improving irrigation management

Increased focus given variability and cost
Started paying more attention to detail, ways of reducing losses and inefficiencies
IRRIMATE - Improved irrigation scheduling, and irrigation length
Improve field conditions for more uniform irrigation

Source: Roth et al 2013 Crop and Pasture Science Journal

www.wrc.org.au
Improving irrigation management

Closing the yield gap

- Breeding
- Digital technology
- Finer scale of management
- Real-time decisions and actions
- Automation
- People
Future Opportunities

Digital transformation of Agriculture – Past/Present/Future

1. Product
2. Smart Connected Product
3. Smart Product
4. Product System
5. System of Systems

Future irrigation management

Source: Horizon Research Project, Michael G. Parker and Anne C. Hepherman, September 2014

www.arcd.com.au
Future irrigation management

Cumulative 3 & 7 day ET$_{ref}$ forecast

Cumulative 3-day ET$_{ref}$ (short) forecast
Cumulative 3-day ET$_{ref}$ (short) observed
Cumulative 7-day ET$_{ref}$ (short) forecast
Cumulative 7-day ET$_{ref}$ (short) observed
Cumulative 7-day ET$_{ref}$ (short) 25yr avg

Future irrigation management

Automation of Farm Practices

Photo courtesy NCEA
Intensifying the scale of management

Can we learn and apply from performance management in elite sport?

Building the capacity of people
CRDC’s Legislated Role

Established to as a statutory authority in 1990
Funded by a grower levy, matched by Government

Objectives include:

• increasing the economic, environmental and social benefits to the cotton industry and to the community in general by improving the production, processing, storage, transport or marketing of the products of primary industries

• achieving the sustainable use and sustainable management of natural resources

• making more effective use of the resources and skills of the community in general and the scientific community in particular