Smarter irrigation for profit

Cotton Research and Development Corporation

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This summary is an excerpt from the final report, with minor edits made to ensure it meets departmental style and accessibility requirements.

Summary

The project aimed to improve the profit of cotton, dairy, rice and sugar irrigators with the support of 16 research and development partners and 19 farmer irrigation technology learning sites. Grower led irrigation research and extension aimed to collect commercially relevant comparative data on different irrigation systems and technologies.

The intention was to provide growers improved understanding of the implications for capital investment, management and the resource requirements (water, energy and labour) associated with different irrigation systems and the adoption of automation technology and different approaches to farming systems.

The project consisted of three components:

1) practical, reliable irrigation scheduling technologies

2) precise, low cost automated control systems for a range of irrigation systems

3) a network of 19 farmer managed learning sites located around Australia.

The project had 19 key learning sites in:

- Queensland

    – Ayr
    – Emerald
    – Warwick
    – Dalby
    – Toowoomba
    – St George

- NSW

    – Moree
    – Narrabri
    – Wee Waa
    – Tamworth
    – Aberdeen
    – Whitton
    – Jerilderie

- Victoria

  - Numurkah
  - Shepparton
  - Macalister
  - Goulburn Murray Irrigation District

- Tasmania

  - Rocky Creek
  - Sisters Creek
  - South Riana, Montana
  - Cressy

- South Australia

  - Allendale
  - Eight Mile Creek
  - Mt Schank

- Western Australia

  - Harvey.

The flagship strategy was use of the key learning sites. These 19 sites were located all around Australia and were mostly on commercial farms. They all involved farmers, advisers, scientists and agribusiness.

Thousands of people inspected or visited one of these sites. Some were more 'research' focused; testing a hypothesis with robust scientific methods. Others were 'demonstration' focused involving monitoring current actions and making changes as experience and confidence grew. One of the strengths of the project was having both approaches.

Adoption activities have resulted in engagement to over 3000 irrigators and industry personnel at a range of field days, field walks and workshops. Many activities targeted sharing knowledge and collaborations across different sectors of

- rice

- cotton

- sugar

- dairy.

These included project collaborations, bus tours to other industries, social media, workshops and farm field days.

The key project outcomes were:

- 10% to 20% improvement in water productivity, efficiency and farmer profitability in the case studies

- adoption of new irrigation technologies and science application by farmers and irrigation professionals to improve farm profits

- improved cross sector industry research collaboration with public and private sectors in four major irrigation industries providing a legacy platform for other sectors to also benefit.

Key findings

Irrigation system efficiency

On-farm audits of energy efficiency and irrigation uniformity showed that many farmers could save money and improve productivity by running periodic checks or audits and giving attention to maintenance. Irrigators should also ensure suppliers provided a commissioning test before hand-over, to ensure equipment is operating within specification.

Irrigation monitoring practice

Monitoring is a mainstay for accurate scheduling. Monitoring options range from high-tech to low-tech and encompass soil-water, plant condition, and weather. Key message for farmers is there is new sensors combined with analytical approaches which will enable autonomous monitoring and control for scheduling.

Irrigation automation

The flow of irrigation water can now be controlled automatically from source to within a field. Key message for farmers is automated irrigation has significant benefits to irrigators through convenience and time-saving, as well as improved irrigation practice. Automation can be phased into a farm beginning with simple monitoring.

Learning and capacity development

Grower-led, field scale trials were widely used to show the practical implications of incorporating new technologies. The network of 'optimised farms' enabled exploration of the issues behind farm scale performance that are otherwise left to early adopters to sort out.

Hallmarks of smarter irrigation for profit

The research emphasis in the Smarter Irrigation for Profit project on design, sensing, scheduling, precision irrigation and automation, has advanced technical solutions for improved productivity and profit in Australian irrigation.

Collaboration between research agencies, commercial interests, commodities and other parties has resulted in the sharing of ideas, and the faster and wider trialling and demonstration of new technologies.

The participative and applied nature of the work, well-illustrated by the network of grower-led, on-farm learning sites, has helped ensure technical solutions addressed irrigator's needs in a practical way.