Converting a furrow irrigation system to a centre pivot - Ben & Pru Coulton, North Star

NSW Sustaining the Basin: Border Rivers-Gwydir

Water source: Groundwater from the eastern recharge aquifer

Enterprises: Cattle and crops including barley, wheat, sorghum, chickpeas and both irrigated and dryland cotton.

Licence allocation: 2000 ML

Irrigated area: 200 ha of pressure irrigation and 300 ha of furrow irrigation

Background

Ben and Pru Coulton farm “Getta Getta” a 5000 ha dryland and irrigation farm 22 kilometres east of North Star, NSW.

The property has been in the Coulton family for 86 years. Ben’s grandfather took it up in 1924 and in the 1950’s his father Keith tapped into the Great Artesian Basin for the precious water that would drought proof his sheep and cattle.

At that stage, they had a hand-shift system that irrigated 60 hectares. Today the irrigation area has grown to 500 hectares, with 300 hectares under furrow irrigation and 200 hectares irrigated by two centre pivots.

Description of the project

The Coultons have changed a portion of their existing furrow irrigation system to a centre pivot pressurised system to become more water efficient and improve the uniformity of distribution on the different soil types.

The centre pivots also allow the irrigation of land that was too steep for surface systems.

A solar powered moisture probe system has also been installed. This collects and downloads information to a mobile phone or computer for scheduling irrigation events.

Ben Coulton and Manager, Guy Ellmen-Brown. Image: S.Bray

Project cost

The cost of installing two pivots in 2006 and 2008 fitted with S3000 spinner sprinklers incorporating 15 psi regulators was approximately $600,000.

The sprinklers were lowered to just over a metre off the ground with each pivot covering 100 hectares.

Pay back period

Mr Coulton estimates the payback period will be five to seven years if using the system in a cotton wheat rotation. However this depends on the future prices of those crops.

The Benefits

There are a number of benefits of implementing this type of irrigation system on “Getta Getta”.

- This system is more suitable for the topography and varying soil types. It allows the speed of the pivot to be slowed down to increase the application on the lighter red soils.
- The gradient of the land is undulating and quite steep at one in 500 (1:500) making it

unsuitable for furrow irrigation. Pivots allow more land to be irrigated.
- Small amounts of fertiliser can be put through the pivot regularly during the growing period which keeps the plants topped up with nutrients and reduces costs by removing the need for applying fertiliser with machinery.
- Unlike furrow irrigation it is difficult to overwater with a pivot irrigation system.
- Requires less labour.
- Requires less maintenance and earthworks each year.

The Outcomes

There have been significant improvements in water use efficiency since the installation of the pivot system.

The Coultons collect routine information for each crop to allow them to assess their annual water use and modify their irrigation management accordingly.

It also provides them with confidence that their investment into improving infrastructure is worthwhile for their farm business.

The following information is a summary of the water use data for cotton grown on "'Getta Getta" during the 2008/09 season.

Field	Area (ha)	Water use (ML)	Total production (bales)	Irrigation Water Use Index (bales/ML)
Pivot	94	263	1096	4.16
Furrow	100	425	1062	2.50

Irrigation Water Use Index = Total Yield (bales or tonnes)/ Irrigation Water Applied (ML)

Advice to other irrigators

Mr Coulton says he initially underestimated the potential of the centre pivot.

"I didn't fully take into account the improvements in water use efficiency and labour savings that would come with changing systems."

Mr Coulton advises other irrigators contemplating a change from furrow to a pressurised system to make sure they do their home work well in advance and design their system so that it can achieve its full potential.

"Economising in the design process can limit your future water savings," he said.

Further information

The Centre Pivot Lateral Move National Training Course is delivered by Industry & Investment NSW through the PROfarm program.

All aspects of design, management and evaluation are covered in the course.

For further information on available courses contact the Murrumbidgee Rural Studies Centre at Yanco on 1800 628 422 or mrsc@dpi.nsw.gov.au

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