



CHANGING IRRIGATION SYSTEMS

Optimising
Irrigated Grains



WATER USE | INNOVATION | FUTURE PROOF



CASE STUDY FARM

Location: Moama, NSW

Farmers: Gavin and Melinda Mann

Total Area: 509 ha

Area Under Irrigation: 305 ha

Irrigation Infrastructure: Lateral covering 125ha, remainder flood

Total Water: 667 ML

Average Annual Rainfall: 450mm

Soil Type: Sandy loam to red-brown clay

CONVERTING FLOOD IRRIGATION TO A LATERAL MOVE SYSTEM

When Gavin and Melinda purchased Denver in 2014 it had been a sheep property for 27 years with an old tired flood irrigation system. Their vision was an efficient cropping enterprise which was sustainable and profitable, while meeting their lifestyle choices. They removed old fences, laneways and channel systems to ensure they were maximising their arable land and looking after natural tree areas. Their system centered around looking after their soils by using minimum tillage, crop rotations and sound fertiliser strategies before considering the irrigation system. Gavin said "water is our most precious and limiting resource, we needed to rectify the irrigation problems to ensure we were using every megalitre efficiently". In 2019 they installed a T&L lateral move irrigator. The irrigator is 480m wide (9.5 spans with an end gun), covers 125ha and travels 2.47 km along a main channel. We spoke to them about their motivation, the information they used to help in the decision making process and the outcomes from this innovation.

WHAT WAS YOUR MOTIVATION TO MAKE THIS CHANGE?

We were motivated by water conservation, reducing waste and labour efficiency. Water resources are limited and we wanted to ensure that returns from every megalitre were maximised. The farm had been lasered and set up with a flood system many years ago, but irrigating using the existing infrastructure was inefficient and time consuming, involving lots of hours on a shovel trying to get water on and off paddocks.

WHAT KEY BENEFITS WERE YOU LOOKING FOR?

We were ultimately looking for more control over our ability to irrigate at the right time to maximise crop performance and minimise water use. The key benefits we were looking for included:

- Uniformly applying the right amount of water at the right time
- Reducing labour inputs of irrigating (more efficient with our precious time)
- Using less water with less waste
- Increasing our adaptability to seasonal variations
- Opening up options for different crop types
- Flexibility with managing our systems and rotations





WHAT INFORMATION DID YOU CONSIDER BEFORE MAKING THE DECISION TO CHANGE?

We knew our old flood system was inefficient with water and extremely time consuming on our labour. Our average crop performance was 3.6t/ha for wheat and 1.8t/ha for canola, but having spoken to other growers and agronomists we heard the best farmers were aiming to achieve 8t/ha for wheat. Given the long-term average water allocation in our area we decided that having a huge amount of capital tied up in permanent water may not be the best strategy going forward. We sort expert advice and made a substantial investment in getting a professional farm plan, which included surveying to determine the best system for our land and soil types. We had a good understanding of our business (operational and financial) and our goals, making the decision easier. We worked out how much water was needed to operate the farm to meet our goals and crop performance targets, and then sold some permanent water to invest in the irrigation infrastructure. The whole project was a significant investment of approximately \$400,000 which included the farm plan, new channel system and lateral.

RESULTS SO FAR

It's a little early to fully measure the impact of the lateral irrigation system in terms of crop and water performance. The first year was 2019 which was a drought with extremely low allocations (3% allocated at the end of June) and high-water prices (up to \$1000/ML). 2020 has seen us off to a more promising start, with 291mm rainfall to the end of July. The lateral has given us the opportunity to irrigate more strategically, this year we've put 30ML of water across the crop in late June when the soil profile was drying out, which we wouldn't have done with the old flood system due to the risks of high water use, waterlogging and waste.

WHAT ARE THE KEY OPPORTUNITIES OVER THE NEXT 5 YEARS?

Drought and water insecurity have been our biggest challenges and although they are out of our control, they have been our biggest driver to plan ahead and ensure we are as prepared as possible to manage the farm effectively and efficiently. The investment in the irrigation system has given us more flexibility with our cropping rotations and opens up the opportunity for us to look into different crops, including summer crops. We will use research, data and future trends to help us make timely decisions and look at new crops, including niche markets. New technologies, improved crop varieties and new markets will create some opportunities in the next 5 years.

"The investment in the lateral irrigation system has given us more flexibility with our cropping rotations and opens up the opportunity to look into different crops"



What key advice would you give to others looking to change their irrigation systems?

- Get a whole farm plan done, it will allow you to think strategically about your farm operation, plan for the future and consider external factors that may come into play.
- Do your research to ensure you get the right system for your farm, soils, operations and enterprise choices.
- Speak to others that are using the systems you are interested in.
- Do the maths, know your business performance and use this knowledge to ensure the economics stack up.



What's next? Do you have any additional changes planned?

Our motto is to do the best we can with the season and our external operating environment. To do this we keep up to date with the latest research and continually gather information to assist in making decisions. We are currently investigating soil moisture monitoring systems with the aim of optimising our crop performance and water use with timely irrigations. Longer-term we are looking at replacing the rest of the inefficient flood system with pivots to ensure that all water is used as efficiently as possible.

MORE INFORMATION

Thinking about looking into upgrading your irrigation system? Here are some resources you might find useful.

Booklet to help navigate planning irrigation set-ups and upgrades produced by Ag Vic & the North Central & Goulburn Broken CMAs - [read more](#)

GRDC Irrigation systems, designs and scheduling options - [read more](#)

Smarter Irrigation for Profit - [read more](#)

Centre Pivot or Lateral Move – what to consider? - [read more](#)

Investing in centre pivot and lateral move systems, Agriculture Victoria - [read more](#)

Things to consider when investing in a soil moisture probe - [read more](#)



The Irrigated Cropping Council in collaboration with key industry partners conducts research to assist farmers with making decisions and manage their water and crops efficiently to optimise profitability.

[VISIT SITE](#)



The optimising irrigated grains project is part of the GRDC investment in ICF1906-002RTX, FAR1906-003RTX and UOT1906-002RTX

