



plan2farm

**RESILIENT
IRRIGATION
BUSINESSES**

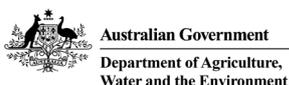
Acknowledgment

The Irrigated Cropping Council is working with The North Central Catchment Management Authority and Murray Dairy to implement the Plan2Farm project. This program/project received funding from the Australian Government's Future Drought Fund.

Plan2Farm is backed by a Steering Committee with representatives from the North Central and Goulburn Broken Catchment Management Authorities, Agriculture Victoria, Murray Dairy, Irrigated Cropping Council, Goulburn Murray Water and local farmers.

Acknowledgment of Country

The Plan2Farm project team acknowledges Traditional Owners within the region, their rich culture and spiritual connection to Country. We also acknowledge the contribution and interest of Aboriginal and Torres Strait Islander people and organisations in land and natural resource management, and pay respects to Elders past, present and emerging.





Preparing for and adapting to future droughts and climate change in the Loddon Campaspe Irrigation Region by planning for future water market scenarios.

June 2022

Summary Notes

These notes are a collection of case studies showcasing how farmers across the region are developing resilient farm businesses.

Project Summary

Preparing for and adapting to future droughts and climate change in the Loddon Campaspe Irrigation Region by planning for future water market scenarios

This project aimed to support farmers in the Loddon Campaspe Irrigation District (LCIR) in northern Victoria to undertake transformational changes in the management of irrigation water. The region is experiencing rapid change in climate and the water markets due to drought, which requires farmers to respond and adapt at a rate not experienced before.

During the twelve months of the project we worked with twenty two farmers from across the LCIR to help them develop drought resilience in their farming system by developing individual action plans for future climate scenarios. These plans have started robust discussions in businesses about the future and will increase peoples capacity to make informed decisions to ensure their business is well equipped to meet any changes arising from a changing climate.

Four case studies were collected as part of the project to showcase how other businesses are adapting to variable water allocations, volatile markets and changing climate, so that farmers can learn from each other. In addition four case studies collected as part of the initial Plan2Farm project are printed in these notes along with other relevant local case studies that were developed by the Irrigated Cropping Council through the Optimising Irrigated Grains project, funded by GRDC.

What you can expect from Plan2Farm?

The Plan2Farm program is all about spending time looking at where your business is situated now and where you want it to be in the future. It's good practice to take a step back from the day-to-day operations and think about where your business is heading and what you want to achieve, both for your farm business and you personally.

The Plan2Farm program provides this opportunity and encourages you to discuss your future plans with the key people within your business.

The irrigation plan workbook is freely available on the North Central Catchment Management Authority Website for farmers to download and use in their business. Completing the workbook will help you identify some key actions to help you achieve your medium-to-longer-term goals. A key characteristic of a successful business is having a plan that guides decision making and tracks progress towards business goals.

The aim of completing the Irrigation Farm Business Plan is to:

- Help you think and talk about the future of your farming business with family and others involved in the business
- Prompt you to think about your business and personal goals and share these with those in your business
- Help you to make decisions that are more informed and aligned to your longer-term goals

Further Information

The irrigation business planning workbook can be downloaded from the North Central Catchment Management Authority and Irrigated Cropping Council websites.

www.irrigatedcroppingcouncil.com.au

www.nccma.vic.gov.au

Current issues

The ability to network and have robust discussions with other farmers was highlighted as a key strength of the Plan2Farm program. Some of the key issues arising include:

- Whether we invest in permanent water?
- Understanding the risks of carryover water and how to use the system to your advantage
- Developing trigger points for your business to help with key decisions
- Volatile water markets and variable allocations and how to build a resilient business
- Climate variability prompting changes to the way farm systems are developed
- Exposure to water market volatility and how to navigate decisions around this
- Irrigation property and water value is very high
- Water use efficiency -Irrigation systems and crop choices
- Future generations, building a viable business for the next generation – succession planning

Impacts from planning

Overwhelmingly farmers that have been involved in a business planning process have valued the time taken out of the business to work on the business. The following feedback highlights the value gained from being involved in the Plan2Farm program. Farmers said:

- Access to an independent consultant was a valuable sounding board
- Valuable discussions around long-standing issues with all family members
- An opportunity to assess the business, consider options and reflect on the future
- Clearer vision for future
- Stronger focus on farm business
- Closer scrutiny of business and decisions
- Clearer succession direction for business
- Provided direction and moved us forward/gave us options and tools to assess our situation
- Greater confidence in decisions being made
- Progressed succession plans
- Networking with other farmers was invaluable
- Useful discussions with other farmers/consultants about water use efficiency, feed systems , crop rotations irrigation systems machinery etc.

CASE STUDY

Plan2Farm Case Study

These four case studies collected during the first phase of the Plan2Farm project clearly highlight how planning benefits farm businesses in many different ways.

CASE STUDY

ADAPTING TO WATER PRICE AND MARKETS GOVERNS WHAT YOU GROW

Plan2Farm irrigation business planning

Summary

Farm: Doug and Tamara Perryman
Location: Boort
Farm area: 650hectare (ha)
Industry: Mixed farming
Livestock: Sheep
Infrastructure: Channel – surface irrigation
Crops: canola, faba beans, corn (grown for grain), barley, wheat, vetch, oats, tomatoes

Strategies

- Improve irrigation infrastructure - be set up to fully use water when you can.
- Understand water markets and costs.
- Flexible farm system - flex between dryland and irrigated.
- Utilising livestock to optimise the system.

Background

Doug operates a mixed farming business growing summer and winter crops and running 550 merino ewes joined up with white suffolk rams, lambing around March-April.

The total farm area is 650ha, with 400ha under irrigation. He also leases an adjoining 160ha of dryland and share farms another 90ha irrigation block.

He describes his farm as established but still developing. The farm was fairly run down when Doug and Tam purchased the main block in 2015 and the decision was made to improve the irrigation infrastructure to ensure that water could be used effectively. When selecting the system Doug invested in the future and purchased an automated system in excess of their requirements. Now almost 90% of the farm is irrigated, and the automation has proven a sound investment, due to the improved irrigation efficiency and labour savings.

Doug uses his knowledge of water markets and how to utilise available water to optimise farm systems to make decisions on crop rotation and the sheep enterprise. He has a plan which he reviews regularly so that he can adapt to the season ahead.

Doug also works as an agronomist and grows similar crops to his clients, but on a smaller scale, which gives him practical knowledge.



How did you change the way you use water in your farm business?

Doug purchases water on the temporary market, so he has implemented changes to build flexibility into his system allowing him to quickly respond to water price. He is tracking the market and making regular decisions on whether to irrigate crops, run a dryland system or adjust the mix of both.

The irrigation infrastructure on both blocks were run down and although it is a big financial outlay to establish or even modify an irrigation system, he decided to invest, wanting to be able to take full advantage of water when it is available and affordable.

A whole-farm plan was developed and it took two years to implement the upgrades. Doug rearranged the farm layout to create longer and bigger bays. The advantages he saw were:

- A longer bay means less irrigation infrastructure per hectare spreading the capital burden over a greater area.
- There is a smaller ratio of channel and outlets compared to number of paddocks, increasing efficiency and reducing maintenance and water losses from the system.
- Fewer service points with only two outlets on the property reduces annual fees.
- It's easier to run fertiliser (Urea) with the irrigation by having less service points on the property.

When the irrigation system was upgraded, the small dams on the property were filled in, and at least one trough installed in each paddock (which are fed by the main dam). This decreased the risk of sheep getting stuck and helps ensure good water supply for livestock.

What impact did the changes have in ensuring your business is more resilient in the future?

The changes have allowed flexibility in the cropping system. In 2018 Doug bought water, although it was expensive. He did the calculations, grain price was good so it was profitable to irrigate. When grain prices are low and water prices high, Doug doesn't irrigate, he switches back to dryland and cuts hay.

The aim is to maximise profitability.

"Water use is opportunistic, you have to watch the water market and climate outlook"

an Pty Ltd 2021

Map





Doug strongly believes "you have to be prepared to take full advantage of your assets when conditions change" so he has also built hay sheds to ensure he is able to store on farm.

Generally, the risk of water being expensive in spring has led Doug to focus on winter crops. For example, he sees holding a paddock for corn and then deciding not to sow as a missed opportunity with the paddock unproductive for 12 months.

In 2021/22 Doug grew corn for the first time because water was cost effective. To mitigate some of the risk of not putting a summer crop in, clover, vetch and oats were sown for sheep to graze during winter. After the sheep had grazed it down and it was close to spring sowing, Doug sprayed, worked the paddock to incorporate fertiliser, and sowed corn. The sheep were then moved to dryland vetch paddocks. This means he's effectively getting one and a half crops out of that paddock optimising land and water use.

Doug's also tried different crops, including poppies. He always bases his decision on which crop to grow factoring in the best gross margin and water use efficiency.



Are there additional changes you are planning to make in the future and what will they be?

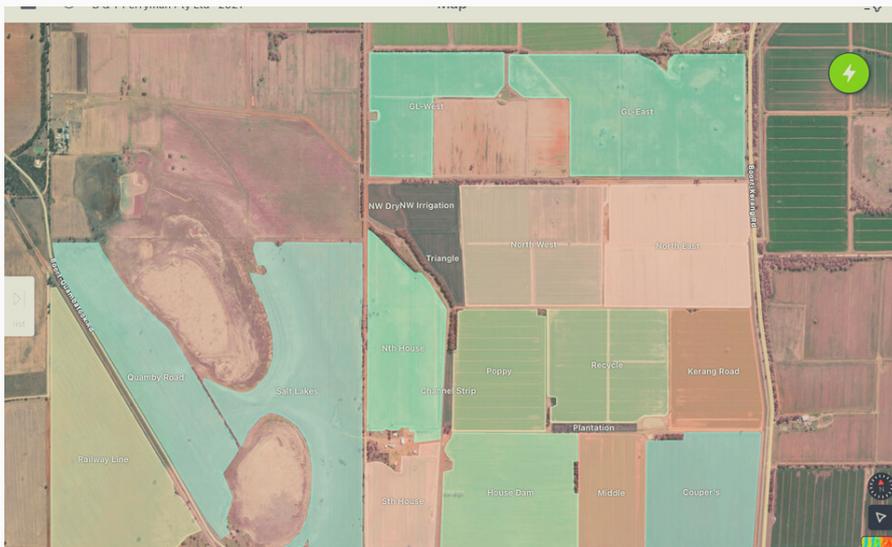
To help with drought management, Doug plans to put in a small feedlot for livestock to ensure he has flexibility in the system to feed livestock efficiently.

"Work on the market price for water... if you can't make as much out of your annual crops as you can from selling your water, then you are creating work for yourself"

If you could make one recommendation about how to successfully navigate changing water markets and variable climate what would it be?

"There will always be variability in water price and availability. An infrastructure plan for your whole of farm is valuable for the longer term. Farming relies on a lot of variables which can change quickly, so you have to be adaptive in your crop choice and water use. Try to be flexible, have a plan, which is reviewed regularly. Be flexible year to year, understand water markets, when water is there and cost effective, then you need to be set up to utilise it fully".

"Finally, maintain your infrastructure and try to minimise your infrastructure per hectare costs. Capitalise in the good years and reduce your costs in the dry years".



"You have to be prepared to take full advantage of your assets when conditions change"

This project received funding from the Australian Government's Future Drought Fund.



CASE STUDY

NAVIGATING CHANGING WATER MARKETS AND VARIABLE CLIMATE

Plan2Farm irrigation business planning

Background

Farm Owner: GJ Quinn and Sons
Area: 5000 acres
Location: Cohuna, Victoria
Enterprise: Dairy
Irrigation: 1150 Murray ML and 350 ML Goulburn water
Infrastructure: Border check

When Pat Quinn's parents first bought the property in 1948 it was a sheep farm of 440 acres. Too small for sheep farming.

Pat's father began transitioning to a guernsey stud four years later and had phased out sheep by 1970. Sons Pat and Bill continue to work the farm with Pat's wife Michelle and their children; Gregory, Kaleb and Erika. All bring a complimentary skillset to maintaining and building their farming enterprise.

The family have expanded the original 440-acre footprint and their most recent purchase of 1200 acres brings the total size close to 5000 acres, with 2500 acres of good soils regularly irrigated and 800 acres of Goulburn irrigation region.

How have you changed irrigation infrastructure on your farm?

The Quinns' farm sits on the border of Victoria and NSW, where the Goulburn ends and the Murray starts. Irrigation was flood irrigation gravity fed from the Murray River in NSW and Torrumbarry system in Victoria.

The Quinns have focused on land purchasing and managing their water entitlements. The purchase of 800 acres of land in the Goulburn region meant the family initially enjoyed the security of two allocation systems. This changed when the inter valley trading regulation was introduced and they were faced with complexities of managing water across two irrigation systems.

The Quinns follow the water markets, and study trends but "sometimes it's a bit like backing a racehorse, you study the form to get a bit of an idea of what's going on and consultants can only advise with the knowledge that they have available to them at a point in time," says Pat.

They converted their small, run-down channels into one major fully automated system, allowing them to ensure optimal water use and returns.

How has climate variability changed the way you use water in your farm business?

Today the Quinns have a totally different way of using water. Through the 70s', 80's and most of the 90's they irrigated summer perennial pastures – that was until the Millennium Drought. In 2002 it was no longer viable to irrigate that way, it took too much water and yields were low. At that time the Quinns were doing partial feed pads, but changed direction and started to grow irrigated fodder crops, cereals and vetch to develop a 50:50 grazing and feed pad system.



In 2014/15 it was hot and dry and water became a big issue. Then in 2016 rainfall was well above average. "It felt like it rained for the whole year. It was so wet, the gravel feed pads disintegrated and had to be replaced with concrete," said Pat.

"By 2017/18 it was dry again, and our water utilisation was not good enough, so we converted to a fully fed system, with no grazing. We went from growing grass to cereals and vetch. Now, only the heifers graze pasture". The Quinns put great credence on the advice of their agronomist and their dairy business consultant. Both have a big influence in their detailed rolling crop rotation plan.

"We went
from
growing
grass to
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vetch"



What impact did the changes have in ensuring your business is more resilient in the future?

They are able to double their yields growing cereals compared to pastures, the quality is better and the cows diet can be managed better by utilising silage, grain, hay, vetch and minerals.



Water is one of the highest costs in the business, and by changing from growing pasture for grazing to a fodder-based system the Quinn's saw the following improvements:

- More tonnes of feed per megalitre of water.
- A better quality controlled diet for the cows so that even in a dry years they can easily feed the cows with a mixed ration.
- In a variable climate, they keep a good reserve, but it's more cost efficient to buy in local feed to supplement when needed.
- Improved effluent management, spreading manure on the paddocks allows the benefit of selective fertiliser use.
- Massive improvements in soil structure by reducing continuous grazing.

"With cereals we can double the yield per megalitre, the quality is much higher and the diet can be better managed"

This project received funding from the Australian Government's Future Drought Fund.

CASE STUDY

TAKING ADVANTAGE OF OPPORTUNITIES WHEN THEY ARISE

Plan2Farm irrigation business planning

Background

Farm:	Darren and Tania Sutherland
Area:	1200hectares (ha)
Location:	Boort, Victoria
Enterprise:	Mixed farming sheep and crops
Irrigation:	1000ML Goulburn water
Infrastructure:	Surface irrigation, 20ha of drip

Darren is the fifth generation to farm the Sutherland farms in Boort. the Sutherlands have been farming since 1877. They take a long-term approach to farming, implementing changes that will ensure a viable farm for the next generation. Working with a consultant through the Plan2Farm Irrigation Farm Business Plan Workbook has helped in the development of a farm business plan which generates new ideas for discussion with the family and helps set the future direction of the farm.

How have you changed irrigation infrastructure on your farm?

What started out as a soldier settlement block with the obligatory crops and grazing land, eventually specialised in sheep and wool, with a sheep stud being established by Darren's great grandfather. The farm has been sub-divided amongst family throughout the years and now Darren and Tania run a mixed farming enterprise.

The sheep enterprise is complimented with 600ha of irrigation to grow feed and grain crops. Their rotation consists of faba beans, wheat, barley and occasionally canola as a break crop. The faba bean stubbles have proven to be an excellent stock feed for the sheep as well as a great way to increase nitrogen and look after the soils.

Each season they take full advantage of the water situation. In wet years they grow as much feed as possible or buy water to carry over for the next season. They also trade water when the opportunity arises.

The original flood irrigation system was set up for pastures to water once in the autumn and once in spring. When Darren took over the farm in 2006 the bays were smaller (20m wide with 6 inch pipes outlets). Since then, the Sutherlands have been improving the irrigation system to allow for increased speed and volume of water applied, resulting in reduced labour and increased productivity for water used.

When the channels were enlarged and the irrigation wheels removed Darren restructured his irrigation to take maximum advantage of the new outlets. He lasered the ground to improve his surface irrigation system and drainage. These changes meant that Darren can now efficiently water 60m wide bays, using big Padman stops, with 18 inch slide risers. So instead of putting out 5 ML over several bays he now has the control to pump a faster flow of 12 -15ML over one bay which is much easier to manage. In addition to labour saving, this has reduced waterlogging, improved water use efficiency and optimised crop productivity.

The upgraded system allows efficient irrigation of pasture and crops (faba beans, wheat, barley, vetch, canola) in autumn and spring and enhances the ability to have a flexible system to respond to changing seasons and water markets.

How has climate variability changed the way you use water in your farm business?

Like many of today's farmers, Darren is on the lookout for improving water and on-farm efficiency. After looking over the fence and admiring his neighbours' crops under a drip system, Darren trialled a small plot with a corn crop through funding from an on-farm water efficiency project.

Twenty hectares of the irrigation is now on a drip system. Crops grown on this system respond well to the flexibility that a drip system provides and can produce higher yields. This year it is vetch, next year it might be canola or wheat depending on market prices. There is also an opportunity to grow a summer crop of corn or sorghum

Darren decided to retain surface irrigation for the majority of his watering, whilst he can see the advantages of the drip system it requires a larger workforce, requires higher maintenance and requires high value crops to make it worthwhile. He always remains open to processes that will improve his farm efficiency and bottom line.

Upgrading the infrastructure also allowed the Sutherlands to develop an on farm irrigation re-use system. This ensures that any excess water is not wasted, but pumped back into the on-farm storage and delivery channel for re-use.

“Efficient use of water is integral to maintaining a profitable farm business”



What impact did the changes have in ensuring your business is more resilient in the future?

During the millennium drought Darren went from a regular 200% allocation to 32%. He's had to learn to be more efficient in his water usage. They have developed a business plan, improved their farm layout and irrigation system, make informed decisions about crop rotations and diversify with their sheep and cropping enterprises to manage risk.

"Our high reliability water allocation is integral to making the most of our other farm resources, if we have an excess, we might sell water to increase cash flow. In wet year's we buy in extra water to push yields and take full advantage of the growing conditions". The Sutherlands use carryover strategically when it's deemed economically viable and low risk.

They plan to conduct a detailed analysis of the physical and financial performance of the operation and develop an understanding of how well the business is utilising its water resources to help make decisions in the future.

If you could make one recommendation about how to successfully navigate changing water markets and variable climate what would it be?

"Be mindful of your reserves". Darren considers himself to be a fairly conservative farmer, so his advice is to have enough reserves and resources to be able to survive if the conditions downturn.

"After the millennium drought, and in particular 2006 which was a 'biting' year, we didn't have enough hay – now we keep several thousand round bales on hand. We would most probably de-stock earlier, when the livestock condition is still good for markets, and just keep the breeding stock and good young ewes."



"Play the game, take advantage of any opportunities the season brings"

CASE STUDY

INCREASING CONFIDENCE IN DECISION MAKING

Plan2Farm business planning

Frank and Maureen Leyden

The main benefit according to Frank has been increasing their confidence in decision making. “Independent advice provided through the Plan2Farm program gave me confidence to get good outcomes from the Connections Program and also to review the best way to grow crops to achieve optimum outcomes.

How did the Plan2Farm Program help?

Frank and Maureen Leyden have been on their farm for more than 40 years. The property was bought by Frank’s father in 1948 and operated as a sheep farm. In 1962 the family converted to dairying, and the farm was expanded in 1988 by the purchase of a neighbouring property. In 2012 the Leydens restructured their enterprise to beef and hay production.

The Leydens plan to continue raising beef and gradually expand lucerne production as part of a transition to retirement before 2025. Their son has no plans to take over the farm, so Frank was keen to look for ways to save labour.

The Leydens joined the Plan2Farm project planning to maximise the potential benefits of the Connections program. They achieved this by increasing the flow rate of water delivered onto the farm from 6 megalitres a day (ML/day) to 12 ML/day and kept 3 out of their original 4 supply outlets.

Frank and Maureen worked with Rabi Maskey from Agriculture Victoria and Charles Thompson from RM Consulting Group to set themselves five goals:

1. Trial 10ML/d bay flows instead of 6 ML/day
2. Check with a lawyer before writing to GMW Connections Project to confirm the connections offer being made.
3. Update the whole farm plan, including 5 ha lasering
4. Expand lucerne production to 36 ha
5. Investigate cube packing for small bale / forklift handling.



Action 1. Trial 10ML/d bay flows instead of 6 ML/d – “One of the best outcomes from the program was the confidence that Charles and Rabi gave me to communicate with Connections”, Frank says. The Leydens achieved their best outcome of a 12ML/day flow instead of 6ML/day. This was done by investing \$12,000 on their farm internal channel system and installing bigger bay outlets and building crossings. \$5K of this investment came from the On-Farm Drought Infrastructure Support Grant from the Victorian Government.

Action 2. Check with a lawyer before writing to GMW Connections Project to confirm the connections offer being made. “Plan2Farm strengthened our resolve to ask for what was fair with the Connections Project”, Frank says. The family was able to deal with the Connections Program to achieve outcomes according to their needs.

Action 3. Update the whole farm plan, including 5 ha lasering – Achieving this objective means the Leydens now have their entire property laser levelled.

Action 4. Expand lucerne production to 36 ha – at the time of the final interview with the Leydens, lucerne plantings have been expanded to 30 ha. The additional six ha of planting is in progress to meet this Action goal.

Action 5. Investigate cube packing for small bale / forklift handling – The Leydens achieved labor savings by purchasing machinery to pack small bales.

The Leyden family says Plan2Farm made a valuable contribution to making their farm easier to manage. At the end of the program, the Leydens have achieved all five of their goals.

Going through Plan2Farm has also helped cement in Frank and Maureen’s mind the importance of planning a transition to retirement in the next five years. Labour required to undertake irrigation was halved with the increased volume of water delivered to the farm and the additional investment in bigger bay outlets, upgrading structures and crossing.

Before Frank and Maureen joined the Plan2Farm program, they were making all their decisions alone. Plan2Farm encouraged the family to seek advice to help with decision making, and they currently work with an agronomist. They also say that their Plan2Farm workbook and consultant have been invaluable as they worked through their five goals, and that the workbook provided them with their goals in writing, making it easier to work towards achieving them.

Overall, the Leydens agree Plan2Farm has provided important skills and advice which enhanced their decision-making ability and gave them confidence to implement the changes needed to increase productivity and reduce labour requirements.

CASE STUDY

PLANNING FOR SUCCESSION

Plan2Farm business planning

Jodie and Colin Hay

“(Plan2Farm) forced us to sit down and examine our business and look at what opportunities exist to move forward in a really challenging landscape.”

How did the Plan2Farm Program help?

Jodie and Colin Hay are dairy farmers at Cohuna. When they became involved with Plan2Farm, they were farming 650 hectares with 520 megalitres of irrigation water available to them and milking 400 cows.

There were six people working in the enterprise when the Hays joined Plan2Farm. Jodie and Colin full time, and they employed four casual part-time milkers. Before they joined the Plan2Farm program, they had already developed a business plan, including water and financial budgeting. They had also created a Whole Farm Plan. However, they agreed these plans needed updating. The family sees the value in using off-farm expertise, and engage an agronomist, animal nutritionist and accountant to help with decision making.

During the initial consultation with farm business management consultant Daryl Poole and Agriculture Victoria's Jenny Spence, the Hays mentioned succession planning as an important component of their future business. The Hays plan to continue farming for the foreseeable future but want to begin a conversation with their son Tom about succession planning.



At this meeting, the Hays distilled their plans into a vision, and six actions to help achieve their goals.

Vision: To continue to run a profitable dairy business that embraces innovation. The business has the capacity to allow for the owners to have extended breaks (greater than 2 weeks) and be in a position to allow their son Tom to come home to the business if he has the desire to do so.

It was decided Jodie would take the lead to work through the actions. However, both Colin and Jodie were responsible for final implementation of each action and deciding on timelines. The Plan2Farm Action plan helped the family move forward quickly. The Hay's made progress on each of their actions.

Action 1: Look to implement a dairy charter of accounts so that farm financial records can be used more effectively for farm management decisions.

Daryl provided Jodie and Colin with a Charter of Accounts to track their financial records more effectively when making farm management decisions. Jodie has been collating the information since July 2019 and will be using this information to evaluate business decisions. An example of this is whether it is more efficient to purchase feed or to grow it on farm.

Action 2: Develop a more detailed water risk management plan that would incorporate a range of different strategies: including: purchasing additional permanent water over time, leasing options, annual purchasing plans and utilising carryover during periods of low water prices.

Colin and Jodie review the water situation constantly, but it is an extremely challenging environment they find themselves in, just like all the other farmers across Northern Victoria. Over the last two seasons Colin and Jodie have purchased temporary water, some of which may be carried over to the next irrigation season.

The decision to purchase temporary water is assessed each season and even through seasons, considering allocation, season and price. They also constantly review whether it is a better option to purchase fodder rather than water.

Action 3: Start to use Dairybase to review the farm business performance.

The Hays are still to implement this action and agree they need to undertake training on Dairybase. In the meantime they are working closely with their accountant who is collating farm data and helping assess farm business performance. The family were directed to and took part in the Taking Stock program which helped them plan their decisions season by season.

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Action 4: Investigate what is required to convert current employees who are casual to permanent part time employees.

Daryl Poole sent through information to Jodie in relation to the current employees' employment status, and Jodie followed up with the employees who were happy to remain as casuals.

Action 5: Initiate discussions with Tom to see what his interest level is in coming home to the farm operation.

Tom (Jodie and Colin's son) has returned to the family business as a full-time contractor for the farm business. Tom purchased sowing machinery which allows him to do contract work for Colin and Jodie and carry out contract out work for other farms in the district. Tom has been back on the property for over 12 months. Jodie and Colin will continue to talk to Tom about whether the current situation is working for everyone. Jodie feels the arrangement is working well for Colin, Tom and herself. Tom's work has increased the workforce to three full time and four casual workers, paid for in part by replacing contact labour during sowing and harvesting.

Action 6: Investigate strategies that will enable both Colin and Jodie to achieve longer breaks from the farm.

Now that Tom has returned home, Colin and Jodie have greater flexibility in planning trips away from the property. Colin and Jodie had a holiday in July 2019 (11 days) as well as a number of other short breaks away from the property. They are continuing to plan other trips. Jodie discussed the idea of doing farm sits (which means still be involved with farm decisions whilst on holiday). Jodie indicated she cannot sit idle. Action 6 has resolved itself whilst on Tom is in the picture.

During the Plan2Farm program, the Hay family made some changes to their enterprise. While their herd size didn't change, Colin has experimented with a feed lot style of herd management, utilising a large shed for shelter and a paddock where the cows are able to graze. Plan2Farm had some influence in making this decision.

Also, the Hays recently increased the size of their farm. This land will be used to produce irrigation fodder crops. Again, Plan2Farm had some influence in making this decision. Jodie and Colin have purchased temporary water to supplement their 520 megalitre permanent allocation, and were fortunate to receive an additional 50 megalitres in the recent water pool.

“Having an independent opinion [had an impact on our decision making]. Looking at the business increased our confidence in our management system.”

They plan to continue irrigating the recently purchased land and the 200 hectares of their home farm. The dryland parts of the enterprise (105 hectares) will continue to be used to grow pasture or opportunistic fodder crops for their herd.

As discussed in the Action Plan, creating a Succession Plan is important to the Hays. While Tom has returned as a full time worker on the property, formal conversations about whether he wants to eventually take over the property have not happened yet. The Hays plan to begin this conversation in the near future.

The process allowed the Hays to look more closely at their business and fine tune areas which needed attention. They welcomed access to new planning and management tools like Dairy base and valued the experience and suggestions of the Plan2Farm consultant and workbook advisor.

Plan2Farm played a valuable role in helping the Hays family achieve their original vision of an innovative enterprise which can support both a family member returning to the farm, and the flexibility for Colin and Jodie to go away for holidays together.

“It forced us to sit down and examine our business and look at what opportunities exist to move forward in a really challenging landscape.”



CASE STUDY

TRANSITIONING FROM DAIRY TO CROPPING

Plan2Farm business planning



Brad and Toni Mueller

“Transitioning from the dairy enterprise was emotionally challenging as dairying was a strong link to my father and grandfather. It was good to have time to take the emotion out of the decision-making thought process. No-one could make this decision for us – we had to think it through.”

How did the Plan2Farm Program help with the transition?

Brad Mueller and his wife Toni ran a dairy enterprise on a 200 hectare irrigated property at Kyabram when they joined Plan2Farm. They have purchased the property from Brad’s parents 10 years ago. The dairy farm had been in the family for three generations.

The Mueller’s were already considering leaving the dairy industry when he met with farm business management consultant Paul Blackshaw and Agriculture Victoria officer Lyndall Ash to develop a vision and action plan using the Plan2Farm workbook.

By the end of the program, the Mueller’s had given up dairying, and were in the process of developing a cropping operation incorporating both irrigated and dryland systems.

When registering for Plan2Farm, Brad said that he used a water budget and whole farm plan and employed the services of an agronomist and accountant to help with decision making. Because he was looking to transition from dairying to other forms of agriculture, he told Lyndall both the water budget and whole farm plan needed updating.



Brad realised that the suggested questions in the Plan2Farm workbook mirrored the questions he was already asking about the future of their operation. “We had pretty much made the “mental move” over a number of years to move away from dairying and I had been gradually thinking about how this might look.”

When Brad and Toni met with Paul and Lyndall they were able to use Paul’s knowledge and experience to answer a lot of questions they had about their new direction. It was also advantageous to have the chance to talk to someone removed from family and friends who could help take the emotion out of decision making. By the time the six-month follow up meeting was held, the Muellers had decided to exit the dairy industry. They made a commitment to a two year plan in a mixed cropping and business system to become confident in his decision making ability. Brad had spent those six months developing a new business plan and begun rewriting his water budget to take into account his decision to become a cropping farmer.

Two years later, the Muellers have transformed their farm into a mixed irrigation and dryland cropping enterprise.

Brad introduced several changes after he sold his dairy herd to concentrate on a combination of dryland and irrigated cropping. Firstly, he bought 80 hectares of land which is not part of the irrigation system. It has a heavier soil type, meaning it holds moisture for longer and also does not carry the associated costs of irrigated land.

And secondly Brad now looks at the value of his irrigation water beyond what he can use it for on his property. He has not changed the amount of water he owns, but rather recognises his allocation as his most valuable asset, and he is more mindful of returns from water when deciding whether to use it or sell it. They have evolved from a 200 hectare irrigated dairy farm growing pasture and fodder crops to a 280 hectare cropping farm with 200 hectares under irrigation and 80 hectares for dryland cropping. They plan to grow cereals, canola, maize, vetches and lucerne.

Brad has planned to upgrade his irrigation system in the medium term, deciding purchasing land was a better investment at this stage than upgrading irrigation infrastructure. He will look at rolling out improvements over five or six years.

Brad realised that the suggested questions in the Plan2Farm workbook mirrored the questions he was already asking about the future of their operation.



Brad provided useful feedback after his involvement with Plan2Farm.

He found the whole experience useful as he transitioned his property.

“It was a big step to let go of the dairy business that I knew so much about and fully commit to a completely different way of managing finances.”

However, Brad says he would have benefited with a follow up meeting with Paul the consultant. In hindsight, he would have liked the chance to discuss and set benchmarks to measure his success in his new enterprise and compare his production both to similar sized properties and broadacre cropping systems.

“When we started cropping full time we were just guessing pretty much, until I'd been through the (first) season - if I'd had some examples to compare with and relate to, I think it would have helped; I'd have been a bit more relaxed.”

“I didn't realise how much 'rebuilding' of my finance and business management would be required – cropping is a very different way of operating – getting used to the ebb and flow of the 'outgoings' and trusting that the assumptions and decisions I am making are based on good information and are sound (cropping) business.”

“My biggest uncertainty is 'how will it work'; I am crunching the numbers constantly. I'm getting better at gauging yield. Knowing our worst case scenario and then being able to make business decisions from that base. I am getting better at managing the water - I sold temporary water because it wasn't worth watering crops at the value I could get if I sold it.”

“Getting input from an independent, experienced perspective was the most valuable benefit (of Plan2Farm program).”

“Getting input from an independent, experienced perspective was the most valuable benefit (of Plan2Farm program).”

CASE STUDY

CONSOLIDATING STRATEGIC PLANS FOR THE FUTURE

Plan2Farm business planning

Neville and Julie Rogers

“(We) can now go ahead with farming instead of selling up / selling water and put the farm worker off, who is still now employed.”

How did the Plan2Farm Program help you?

Neville and Julie Rogers took part in Plan2Farm in 2018 and at the time were running a mixed beef cattle and dairy enterprise on their Beverford property. They were uncertain about continuing the operation of their dairy business and were making the transition to beef cattle with lucerne production. They chose to participate in Plan2Farm when the family was weighing up which enterprise they would like to operate in the future.

The Plan2Farm program funded farm business management consultant Daryl Poole, from RM Consulting Group and Ruby Barnes, from Agriculture Victoria, to visit the Rogers and discuss their farming future. At this meeting, Neville and Julie established an Action Plan. The key actions were:

- “1: Develop a short-term plan to maximise the farm’s earning capacity for season 2019/20. Three strategies will be considered:
 - Purchase an additional 50 autumn calving cows as stage 1 of a herd rebuild – Daryl to provide a feed budget to determine fodder requirements in the short term.
 - Maintain current numbers and sell surplus fodder. Maximise spring production and then consider selling surplus water on the allocation market.
 - Sell all stock and focus on fodder production for sale and selling of excess water. Look to get some further assistance to assess the merits of the different strategies above – this could be through the Murray Dairy Taking Stock support.



2: Develop a detailed cash and feed budget for the operation of a 200 cow autumn calving herd to assist in determining the longer-term viability of the operation. Look to use the Murray Dairy's "Taking Stock" program to assist in developing the budget or utilise the support from milk company.

3: Once the budget has been developed have a family meeting to decide whether the strategy is to be implemented. It will be important that all family members are fully committed to the plan and it is recommended that the family meeting be facilitated by a trusted advisor.

4: Depending on the outcome of action 3, look to develop a staged implementation plan. The implementation plan to include the installation of cup removers in the dairy.

While Julie and Neville are the business owners, their son Matt is an important member of the farm business and was included in the discussions.

After working through the first part of the Action Plan, the Rogers decided to adopt the first strategy – to rebuild their dairy herd and concentrate on milk production. The decision was accepted by all family members.

To implement the plan, the Rogers considered the value of temporary water on the market and worked with their factory field officer to complete seasonal feed budgets. They decided not to irrigate any summer pasture for the 2019/20 summer. The funds from the sale of their water on the temporary market was used to purchase 115 cows. This increased farm milk production and purchased the feed required for the herd over this period. With increased herd size, the Rogers employed two additional casual milking staff.

The Rogers found Plan2Farm was valuable in creating a strategy for their property which the entire family was prepared to adopt, and they are now feeling positive about the future.

They plan to build their herd to 300 cows to maintain their viability. The family identified uncertainty around rain, milk prices and water prices as risks in their planning. The Rogers say that Plan2Farm was critical in making these decisions.

The Rogers found Plan2Farm was valuable in creating a strategy for their property which the entire family was prepared to adopt, and they are now feeling positive about the future.





Optimising

Irrigated Grains



ADAPTABLE FARM SYSTEMS

IRRIGATION | INNOVATION | MIXED FARMING



CASE STUDY FARM

Location: Durham Ox, Victoria

Farmers: Todd Martin

Total Area: 750ha (plus 650ha Feb 2021)

Area Under Irrigation: 350ha

Irrigation Infrastructure: Centre pivot - 2 areas covering 94ha, remainder flood

Total Water: 600ML (plus opportunistic temporary water)

Average Annual Rainfall: 350mm

Soil Type: Brown clay loam to black self mulching soils

Crops: canola, barley, wheat, faba beans, vetch

DEVELOPING A FARM SYSTEM TO ADAPT TO CHANGING ENVIRONMENTS

When Todd came back to the farm 14 years ago, it was a traditional sheep farm running merinos. He had a vision that they could improve profitability with a cropping enterprise to compliment the sheep operation. Together with his father they started on a small scale and built cropping into the system.

After a few years they decided to scale up, putting in new irrigation infrastructure and purchasing the appropriate machinery. They installed a towable centre pivot for two sites that is fully automated on land that could be irrigated but was not suitable for lasering and a flood system. They grow crops (barley, canola, wheat, Faba beans and vetch) on the dryland and irrigation using a minimum till stubble retention system.

There is a great synergy between the enterprises that allows for a sustainable, profitable system that maximizes the farm area. The sheep enterprise comprises of 750 ewes is self replacing merinos, a dual purpose flock. They utilise areas not suitable for cropping and the sheep clean up in the cropping areas. Lambing is set up around being able to utilise off season feed.

The mixed enterprise increases adaptability of the system and allows decisions to be made based on water price and availability and the comparative commodity prices of the two enterprises. The new irrigation system provides more flexibility to pre-water crops and fully irrigate over spring to maximise yields and opens up options for incorporating different crop types into the system, including summer crops.



With an increase in summer rainfall we found that cropping was better suited to our area, as we could control weeds and conserve moisture to grow crops the following season. Sheep need to be fed 12 months of the year, whereas crops only 5-6 months. Particularly on the dryland we found that we could make the most of the moisture available, we could grow a good crop on 150mm (at the right time of year) compared with feeding sheep. I worked out that we would need to run 1 ewe to the acre on our dryland to beat the crops and that is just not possible, you'd have bare paddocks and have to feed all the time.





WHAT WAS YOUR MOTIVATION TO MAKE THIS CHANGE?

Water became harder to come by, although we always had permanent water, we increasingly found the price of water meant it wasn't always viable to feed sheep, even with good meat prices. Introducing cropping into the system meant we could adapt to fully utilise our water for maximum results.

We had reached the maximum that could be achieved with the flood irrigation system, so the overhead system provided more flexibility to expand our irrigation area while also increasing watering efficiencies.

Labour efficiency was also a key driver, we decided if we were going to expand we would ensure it was not too labour intensive and that the system could be managed remotely.

WHAT KEY BENEFITS WERE YOU LOOKING FOR?

We were looking to expand our system and putting in an overhead system allowed us to do that, given our land wasn't suitable for further lasering and flood. The key benefits we were looking for included:

- Expanding the area of irrigation on the farm to make better use of water available
- Strategically applying water at either end of the season
- Reduced workload, more effective use of our labour
- Flexibility with managing the cropping system and rotations

RESULTS SO FAR

There is a great synergy between the sheep and cropping enterprises, it allows flexibility to value add our water to grow crops when the viability of growing sheep feed with irrigation is not there.

We haven't been through a full irrigation season to be able to measure any results in terms of crop performance. The system hasn't been pushed hard, we are still learning about how much water to apply and when. But there has been a noticeable difference in our labour requirement to manage irrigations, the biggest labour input is moving the pivot between sites, which takes about 4 hours and can be done with one person. The system has also allowed us to have more control over when and how much water is applied.

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

We have just expanded our land area by purchasing a neighbouring farm, a farm we had been leasing. That essentially doubles our area, the property is very similar to ours and has a fairly modern flood irrigation system. The next stage for us is to upscale our current system to include the extra 650ha and consolidate to get the farms operating as efficiently as possible. The expansion was a strategic decision, we had been looking for land when the property next door came up, it provided the perfect opportunity. The plan is to effectively double what we are doing with the crop and sheep enterprises.

How water is utilised across the two farms will depend on availability and price of temporary water and commodity prices. There is definitely scope to play around with other crops in the future that are not suited to flood irrigation, possibly lentils or chickpeas. In years with an abundance of water, summer crops are also an option.

When the new irrigation system was installed, we planned ahead and it was all piped up and the infrastructure put in place so that we could easily have two pivots operating instead of the one.

"Be open-minded and adapt the system to the situation and economics"

"We are not doing anything exceptional, just trying to get the basics right!"

"You've got to have an adaptable system that can move with water, price and commodity markets"

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

Firstly it was looking at our landscape and options for improving the farming systems. We had an area that would allow us to expand the irrigation area, so after considering different systems

Research results from trials is a source of information we value to provide the information we need to make informed decisions..

We also use an Agronomist to bounce ideas off and to help keep us up to date with the latest industry information.



WHAT KEY ADVICE WOULD YOU GIVE TO OTHERS LOOKING TO DEVELOP ADAPTABLE FARM SYSTEMS?

- Information has never been easier to come across with research and the internet. Seek out the information needed.
- Get the basics right and do it well.
- Research to ensure you get the right irrigation system for your farm.
- Be adaptable to deal with the variations in water price and availability.
- Think ahead about water availability (irrigation and rainfall) and plan rotations based on the best information available.



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](#)

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

Satellite Irrigation Advisory Service and Irrigation Monitoring - [read more](#)



Irrigated Cropping
Council

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





Optimising
Irrigated Grains



CHANGING IRRIGATION SYSTEMS

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
- GRDC Irrigation systems, designs and scheduling options
- Smarter Irrigation for Profit
- Centre Pivot or Lateral Move – what to consider?
- Investing in centre pivot and lateral move systems, Agriculture Victoria
- Things to consider when investing in a soil moisture probe



Irrigated Cropping Council

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.

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





About Irrigated Cropping Council

The Irrigated Cropping Council (ICC) is a not for profit farming systems group, committed to improving the profitability and long-term viability of mixed farmers and croppers through practical research, development and extension that leads to best practice. The ICC is a membership organisation providing members with access to our variety trial results within days from harvest, regular research updates and discounted entry to ICC run events.

Our Region

Our region spanning across the Murray River from the northern Victorian irrigation regions to Southern Riverina in NSW presents a unique opportunity to build a knowledge base across many regions, environmental conditions, crop types, management systems and irrigation systems.

Our Trial Site

Our irrigated research site situated just outside of Kerang Victoria provides the perfect base to conduct local research providing relevant information to growers across the region. Research trials conducted at the site focus on all aspects of irrigated grain production including agronomy, irrigation scheduling, plant nutrition, crop diseases, weed and pest management and risk management.

Our Projects

- Irrigated Variety Trials, some of the only fully irrigated wheat, canola, barley and faba bean variety trials nationally. Results of these are shared exclusively with ICC members with yield results coming out within days of harvest. Funded by ICC Memberships, Pioneer, Pacific Seeds, AGT, BASF, Nuseed, Seed Force, Seednet, Intergrain, University of Adelaide,
- Optimising Irrigated Grains, small plot research investigating the agronomic levers to increase yields of maize, canola, durum, barley, faba beans and chickpeas. Delivered in collaboration with FAR Australia, funded by GRDC
- Irrigated Discussion Groups, meet 4 times a year to discuss topics of relevance to the members. The focus has been on farm visits to see how irrigators in our region are responding to the high opportunity cost of water and built in flexibility to their systems. Funded by GRDC
- Fodder for the Future, researching the balance between quantity and quality for winter cereal, winter pulse and summer fodder options. In collaboration with Marry Dairy this project is funded by Federal Government under the Murray–Darling Basin Economic Development Program.
- Increasing soil carbon to ameliorate compaction in irrigated soils - Goulburn Broken CMA and the Australian Government's National Landcare Program
- Plan2Farm – Irrigation Business Planning Program enabling farmers to develop their business plan with support from agribusiness consultants, funded by the Australian Government's Future Drought Fund.
- Southern NSW Drought Resilience Adoption and Innovation Hub, ICC are part of the knowledge broker network, giving you a say in the direction of projects delivered locally – Funded by the Australian Government's Future Drought Fund.
- Irrigated Ag Conference – a cross-industry event bringing together leaders from the grains, rice, cotton and dairy industries.
- Heat Stress in Canola, a pure research project screening large amounts of germ plasm to see how they are impacted by heat stress, delivered in partnership with UWA and funded by GRDC
- Smarter Irrigation for Profit - Phase 2 – Demonstrating different irrigation strategies aiming to get the best returns from water when prices are high, Funded by Rural Development Corporations (grains, rice, cotton, dairy and sugar), through funding from the Australian Government Department of Agriculture's Rural R&D for Profit program.

More Information www.irrigatedcroppingocuncil.com.au

Notes

