



## Smarter Irrigation for Profit Project

# Hunter Optimised Dairy Irrigation Farm (NSW)



Upper Hunter Dairy Farmer: Scott Wheatley

**Glenhaven**, located at Aberdeen in NSW's Hunter Valley, is the location of the Optimised Dairy Irrigation Farm for NSW in 2017/18. Manager, Scott Wheatley, milks a herd of 300 cows on 255 hectares (ha), comprised of a 130ha irrigated milking platform and 125ha of young and dry stock area. In 2016/17 the farm produced 2.25M Litres of milk (153,867 kgMS) and achieved a milking platform dry matter (DM) utilization of 8.4tDM/ha (6.4 tDM/ha grazed pasture & 2tDM/ha conserved pasture) at a cost of \$127/tDM to produce. Home grown feed constitutes 65% of the milking herd diet. (Source: Unpublished data, 2016/2017 Dairy Farm Monitor Project, NSW DPI)

Scott has 3.5 labour units, including himself, to operate the business. His surface and groundwater entitlements total 1200 ML, only half of which was accessed in 2016/17. The irrigation infrastructure is made-up of 3 centre pivots (28ha, 15ha & 13.5ha), K-line irrigators (30ha), 1 hard-hose (15ha) and 3 soft-hoses (58.5ha).

The focus of the project is a three span (plus overhang and end gun) Bauer centre pivot, installed in 2009 to irrigate an area of 13.5ha (290<sup>0</sup>). His motivation for becoming the farm in focus for the year is to investigate ways to increase the profitability of home grown feed production by improving water use efficiency. Decreasing expensive power costs is the main driver rather than water use reduction. He believes the project will help him more accurately calculate how much both conserved and grazed home grown feed is costing to produce under the pivot. His aim is to maintain or increase yield whilst reducing the cost of inputs.



**Glenhaven: Site of study pivot area noting soil sampling undertaken to ground truth EM38 results and characterise soils**

"We have a good handle on our seed, fertiliser and labour costs but the project will allow us to better track the water and power costs. We are asking ourselves whether producing home grown conserved feed is worth our while. Irrigating flat-out over summer just might not be economical unless we find efficiencies."

### Study Pivot Forage & Fodder Plan 2017/2018

The project will be operating under Scott's feed plan for the site. DM production and utilization measurements will be taken, as well as feed quality tests. His annual plan for the 13.5ha site is:

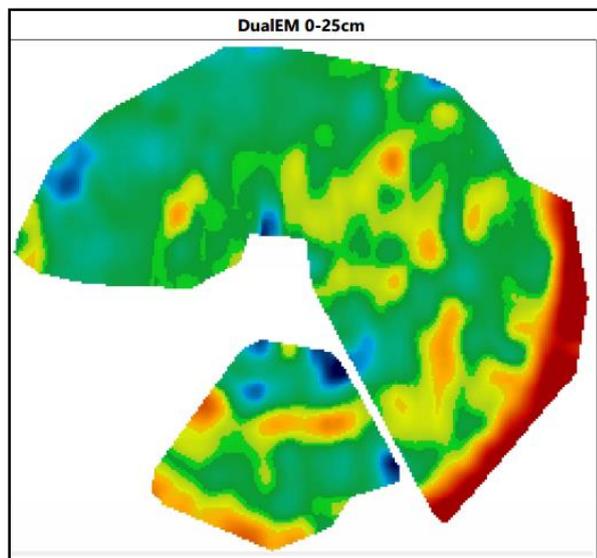
- *July 2017*- barley already sown
- *September/ October 2017*- harvest
- *Spring/ Summer 2017*- Lucerne based pasture over-sown for direct consumption over 4 grazing rotations. Pivot area managed as two separate paddocks- strip grazed for 4 to 6 days/ paddock. Competing summer grasses (kikuyu/couch) to be managed.
- *Autumn 2018*- direct drilling of prairie/clover/ chicory in February for first grazing in April.
- *Winter 2018*- mixed pasture feed sown for three year persistence for grazing or conserved feed, as warranted.

### Baseline Investigations

Commenced in July 2017, the project has:

- Collated 2016/17 energy, water, production and irrigation performance comparison farm data to establish the project's baseline data-set.
- Conducted Electromagnetic Surveying (EM38 Mapping) of the study area, together with deep soil core sampling (1.2m depth) to characterise the soils located under the pivot.
- Installed a Tain Electronic soil moisture probe with sensors at 15cm, 40cm and 100cm and a tipping bucket rain gauge. The probe siting best represents the soil type of the irrigated area and is connected to a logger which graphs the soil moisture at regular daily intervals. Scott can view the results of the sensors & rain gauge using a smartphone App or website.

- Formed a partnership with locally based irrigation specialists, Blooms Water, which has supported the installation of a flow-meter to more accurately measure water use.
- An Irrigation System Performance Evaluation is being prepared by independent irrigation consultant, Peter Smith of Sapphire Irrigation Consulting.



**Glenhaven: EM38 mapping has identified variability in soil type to be considered under the study pivot area.**

#### Planned activities 2017 /2018

- Undertake an irrigation performance comparison between a previous study (2011) and the project's evaluation. Identify changes and potential causes of increased or decreased performance.
- Formulate a set of recommendations from the performance evaluation and undertake actions which can be implemented in the timeframes of the project.
- Farm to be established on the Scheduling Irrigation Diary (SID) software (University of Southern Queensland). SID is accessed via any web connected device, or a synchronised App, and is used to inform irrigation scheduling (where, when & rate) and record water use.
- Explore options for retrofitting a remote control system.
- Study sites to be established to accurately monitor pasture yield (tDM/ha) & utilisation (tDM/cow), measured using an electronic pasture meter by agronomy advisors, Clydsdale Rural.
- Establishment of ongoing energy, water, labour and production farm monitoring program to assess quarterly efficiency gains and profitability performance.
- Monthly irrigation and agronomy consultancy meetings will be held with Scott. These sessions will be used to analyse available data to inform irrigation decisions.

- Monthly Irrigation Reports will be prepared by Sapphire Irrigation Consulting, Clydsdale Rural and Scott. These reports will be broadly distributed, via industry e-newsletters, to communicate how utilised monitoring technologies are informing farm irrigation decisions to other irrigators of NSW. Production results will support these reports.
- Open Days will be held to introduce the project to the local farming and service provider community and extend the key learnings as they unfold.

#### Farmer Involvement

The project is providing opportunities for local farmers to receive real-time soil moisture and rainfall logging data as well as introduce them to available technologies such as SID to better inform their own irrigation decisions. Following how data results are informing short and longer term management decisions on Scott's property can be valuable information for local farmers. Key messages on how monitoring data analysis is used to inform management decisions, is broadly applicable to dairy irrigators across NSW.

#### Starting Smarter

Supported by Hunter Local Land Services, the project is conducting a sub-project in parallel, aimed at improving yield performance through better management of the irrigation season start-up phase. The project is working with a group of local farmers to identify knowledge and understanding needs to support:

- (1) Commencement of the season on time and applying water efficiently (Know your irrigation system, pumping system, available scheduling tools & take action).
- (2) Scheduling irrigation to meet crop needs (Know your soil, crop/pasture and climatic conditions).

The Group will guide development of resources for NSW dairy irrigators aimed at optimising yields for their particular farming system, preparations to efficiently operate irrigation investments, and adopt appropriate monitoring & scheduling methods. These may consist of the following topics:

- Maximising the potential of infrastructure and equipment investments;
- Keeping ahead- optimising irrigation scheduling to maximise profit; and
- Making the key decisions- a scenario based decision support tree.

***The Smarter Irrigation for Profit- Hunter Optimised Dairy Irrigation Farm Project is funded by Dairy Australia and the Australian Government Department of Agriculture and Water Resources as part of its Rural R&D for Profit program.***

*The project has also been supported in the Hunter, NSW, by Blooms Water, Precision Cropping Technologies (PCT) Pty Ltd (EM 38 Surveys) and North West Local Land Services (Soil sampling & characterisation).*

**For further information on the project and all monthly irrigation reports go to:**

<http://www.dairyingfortomorrow.com.au/tackling-specific-issues/water/smarter-irrigation-for-profit/> or search "Smarter Irrigation for Profit" on Facebook.

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