Hunter Irrigating for Profit Project

MAKING EFFECTIVE IRRIGATION DECISIONS

Irrigation Report:

November 2021 to early February 2022

Visit the website HERE for an abundance of practical irrigation resources and the latest seasonal video from the Gloucester soil moisture monitoring sites.

Irrigation- what's that this summer?

Vastly contrasting conditions from a significant winter/spring irrigation period last quarter to a wet summer that has so far (early February) seen rainfall of 629mm! How have the two *Hunter Irrigating for Profit Project* host farmers responded in Gloucester?

Bowman Farm

Sowing a 90-day summer maize crop on the 16th of November, Tom Middlebrook watched as 165mm of rainfall soaked 100mm height seedlings between the 19th to the 28th of November.

"Whilst approximately 0.5% of the paddock was impacted by waterlogging in the low-lying areas, most of the crop continued to develop and, overall, we have seen no effect on quality from the early rains, and again December and January when we experienced a further 378mm," says Tom.

According to Tom, it has been a "phenomenal" cropping season, with two herbicide sprays being the only management needed. In his words, "It couldn't get any easier."

"On days 30 and 50 we sprayed for Fall armyworm and Heliothis. They obviously had little impact on crop development with a growth rate continuing of about 200mm/day. Now at 83-days, some stalks are at four metres height and are double cobbed."

A further 65mm of rainfall in the first week of February means that irrigation certainly has not been a consideration at all. The crop will be harvested on day 100, around the 24th of February.

The plan this autumn is to respond to the increasing access and cost concerns associated with nitrogen fertiliser.

"This year we're going to do something a little different to the brassicas we have used in past missed winter pastures. We are going to be putting an inoculated clover mix into

Figure 1. Tom Middlebrook of Bowman Farm pictured on day 83 of the summer maize crop. Growth rate is 200mm/day with double cobbing occurring. The crop will be harvested day 100, around the 24th of February.

our annual rye and cereal pasture to reduce the need for nitrogen and improve the quality of our pasture heading into spring," provides Tom.

A 20kg cereal/ 10kg clover/ 15kg rye per hectare mix is likely to be sown, with a starter fertiliser.

"This is yet to be set in concrete but will be more or less how we will move forward to manage our costs in the coming season and prolong pasture quality".

Kywong Flat

At Kywong Flat, silage was cut early November and December, with F3 seeing a strong transition into Kikuyu requiring ongoing slashing to maintain quality. F6 has seen the Prairie Grass remain quite vegetative, because of mild conditions, along-side the deeper rooting lucerne and chiccory.

"It's really been quite challenging wet conditions, whether that has been managing grazing, making silage or just trying to get the cows to the paddock with the Barrington River coming through the farm," provides Adam.

Whilst there were actually two periods when soil moisture dropped below RAW (Figure 2), irrigation was not applied as Adam's forecast data gave him confidence that rainfall would imminently refill the profile in coming days.

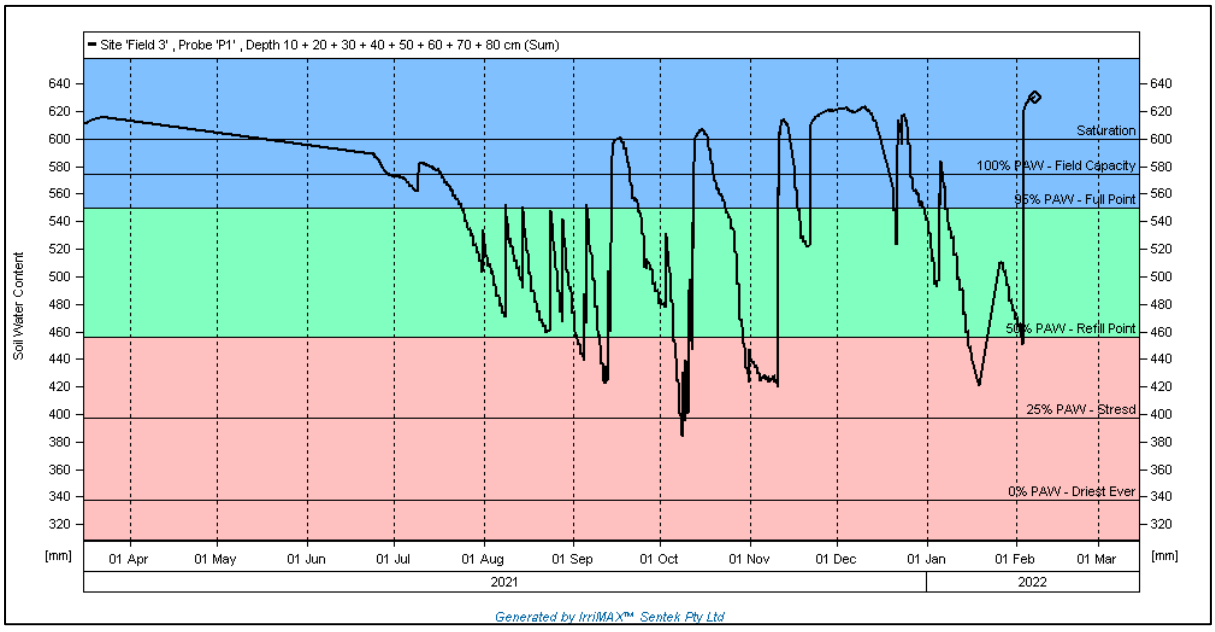

Figure 2. F3 summed soil moisture graph showing soil moisture below RAW at times, followed by high rainfall events and periods of above saturation point.

"You need to use all the data in front of you to make those decisions," he says.

Whilst both F3 and F6 had prolonged periods of above full-capacity, the two soil types have seen the lighter soils on F6 drain rapidly, avoiding over saturation, whilst on F3's heavier soil, careful management has been needed to avoid pugging, with draining occurring less rapidly.

Given current prices, a decision has been made not to apply nitrogen. Chicken manure is the current strategy following the cows as a rate of 5m^3/ha.

The Italian ryegrass will be sown mid-March on F3 whilst on F6 the chiccory and clover will be topped-up.

Monitoring equipment not "set and forget"

During the period both farms had difficulties with their 3-year-old soil moisture monitoring equipment, a reminder that:

(1) The technology needs to be actively maintained; and
(2) when it comes to making purchase decisions, most often you get what you pay for!

Both farms have replaced the rain-gauges because of ongoing mechanical and data logging issues. These have been replaced with higher quality, more reliable but more costly systems at $600 RRP (Figure 3). compared to replacement of existing units at $300 RRP.

"It's a reminder that these systems are not set and forget," says Adam. "You really need to be monitoring them and make sure that what you are seeing is ground-truthed. The outlay is worth it, that's for sure, in that you have the right data on-hand when you need to make decisions impacting outlay costs, such as power and water, and production outcomes."

At Bowman farm, Tom admits that a lack of communication on his part saw a set of deep rippers go through the cable connecting the probe to the data logger during planting of the maize crop.

"We have been trying to find a dry spell when we can resolder the cable. It's just lucky on our part that this happened in a wet summer. I would have been totally lost if I was relying upon the data to make my irrigation decisions."

Figure 3. The tipping bucket rain-gauge on both farms has been replaced with higher quality units connected to the existing data logger and telemetry.

The importance of having a good advisor to support both the equipment and interpretation of the data is integral when considering what equipment to install and the online platform used to report the logged data.

"The support of Brian Thomson and his staff at Porosity over the past three years has been excellent," said Adam. "Again, it's a reminder that this technology needs maintenance and it's good to have quality advice on-hand."

Upcoming considerations

- The Bureau of Meteorology's prediction for the next quarter is 75% chance of 300-400mm.
- As autumn sowing occurs, both farms need to monitor soil moisture in the top 20cm to ensure good establishment.
- With new rain-gauges installed, the logged data needs to be ground-truthed to ensure the units are accurately capturing and logging rainfall.
- The combined effect of nitrogen loss through high rainfall events (leaching & dentification) and reduced application, may affect nitrogen availability in autumn and spring. Research of the *More Profit from Nitrogen Program* demonstrated that a high percentage of nitrogen is actually held-up in the soil and mineralised down the track for plant uptake. Whilst the results of reduced nitrogen may not be obvious immediately, it may become a constraint in the future and both farmers will need to respond accordingly to optimise production under irrigation.
- Mixed pasture species should be irrigated with consideration for the shallowest rooting plant, potentially requiring smaller irrigations more frequently.
- All irrigating dairy farms should now be using the freely available water balance tool, IrriPasture (https://irripasture.com/) to assist in irrigation scheduling decisions. The tool uses ingested BOM data (evapotranspiration (ETo) & rainfall), the relevant plant crop coefficient (Kc) of major pasture and crop types of the Australian dairy industry, soil type data and inputted irrigation events to determine an irrigation area irrigation schedule.
- Have confidence on when to implement or hold-off on IrriPasture's recommended schedule using the freely available *Weatherwise* (https://weatherwise.swansystems.com.au/). Weatherwise is a free daily 7-day forecast notification of predicted rainfall and ETo. In Adam and Tom's experiences, the forecasts (based upon a 6km grid system) are highly accurate.

SCAN ME

Visit the project page on the Hunter Local Land Services website for helpful irrigation resources and this quarter's videos with Tom and Adam!

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