

MAKING EFFECTIVE IRRIGATION DECISIONS

May 2021 Irrigation Report: February - April period



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Believe it or not- pasture recovery relies upon monitoring over-drying!

As the region recovers from the one in one hundred rainfall events of March, which saw 450mm inundate the Gloucester *Hunter Smarter Farming: Irrigating for Profit Project* sites, “soil moisture” has become almost a dirty term...who wants to downcast drying when it is all we have wished for?

As Tom Middlebrook, of Bowman Farm, and Adam Forbes, of Kywong Flat report, the decisions they made on the run late March have returned both hits and misses to date, but as conditions now dry, the way they continue to manage soil moisture and nitrogen applications may be the true indicator of successful recovery.

Effects and management of drying after saturation

With a February to April period of 700mm of rain, irrigation has been far from the minds of both Tom and Adam. As *Figure 1* demonstrates, early February saw soil moisture levels decline to ideal, sitting high in the Readily Available Water (RAW) zone, below the full point. Late February, when rainfall of 200mm was experienced, conditions became saturated and then waterlogged (or flooded on the river) with a further 450mm in March.

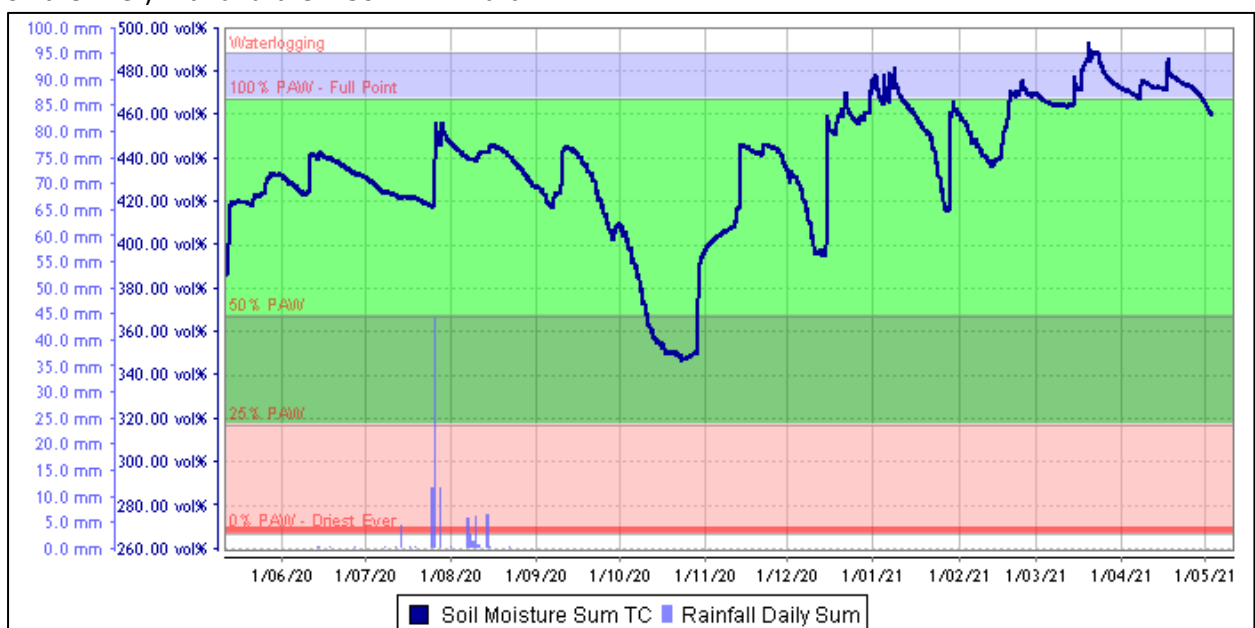


Figure 1- Soil Moisture Graph of Bowman Farm

Bowman Farm

“Between the 16th and 25th of March we couldn’t get onto the area,” says Tom. “We had the paddock partially drilled on the 15th of March to an Italian rye/ barley/ brassica mix, so I made a snap decision to have the helicopter broadcast the entire area on the 26th of March in my nervousness to get going on recovery.”

After the rainfall event, evapotranspiration (Eto) remained between 23mm-25mm/week. The success of broadcasting seed was mixed at the irrigation study site of Bowman Farm, with these drying conditions causing a solid dry cap to form across the topsoil of the compacted site (*Figure 2*).



Figure 2- Compaction of the saturated site has led to topsoil hard capping and poor establishment in some areas of the site.

“In hindsight we should have waited 48 hours to get onto the site and drill to ensure we had good seed to soil contact. The results are patchy, and where we have had better success, growth is slow.”

To appreciate the effects of drying on the establishing Italian rye/ barley/ brassica, *Figure 3* shows that the top 35cm, the zone in which the developing plant roots are seeking moisture, has dried rapidly.

“Although the barley and brassica are deeper rooted, I don’t think they can get past this top area of the soil profile, we need to irrigate carefully now to break-up the dry-crust and get moisture to where it is needed.”

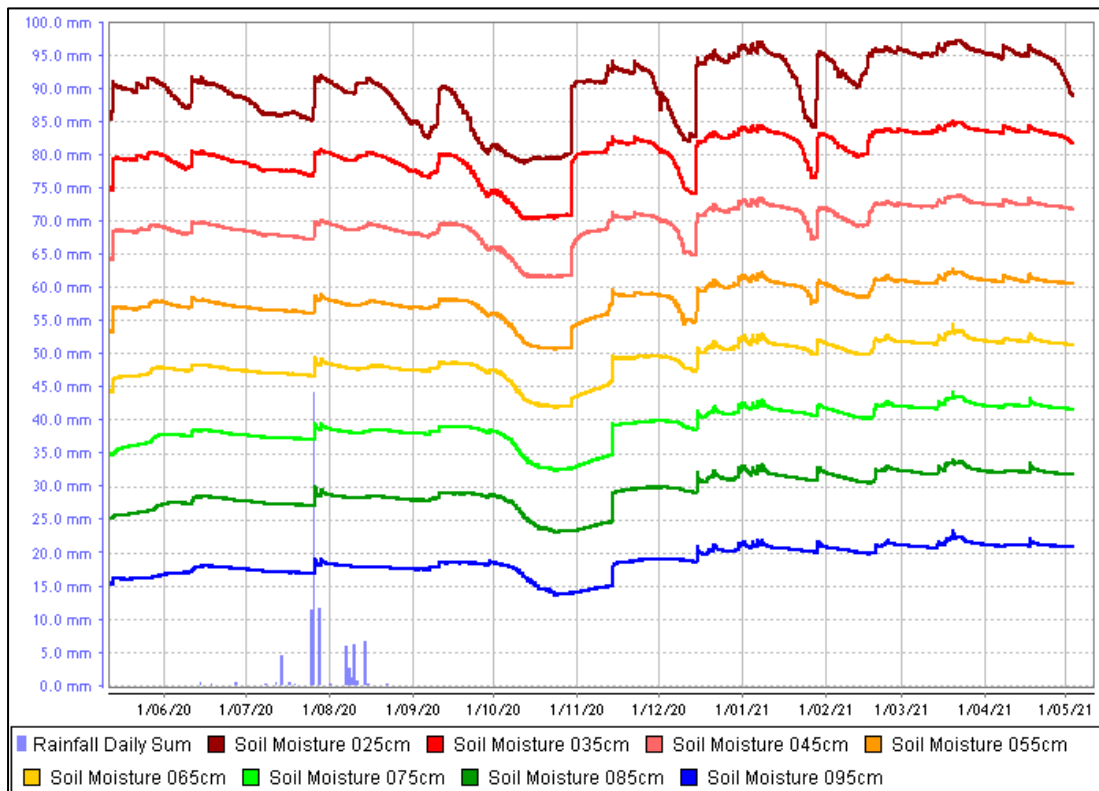


Figure 3- Soil Moisture Stacked Graph of Bowman Farm

The centre pivot was caught in a difficult position during the flood, causing the motor to become inundated. Testing is required prior to start-up, with a 30mm application needed if the SWAN Systems 7-day forecast for approximately 30mm does not eventuate.

“Nitrogen has also been important to manage because there has been a loss of good organic matter from the topsoil in some areas and leaching of nitrogen certainly would be a factor. While seed broadcast was accompanied by a starter fertiliser, I have applied a further 120kg of urea since.”

Kywong Flat

The effectiveness of recovery management at Kywong Flat reflects the different pasture establishment stages and soil types of the sites, prior to the rainfall event. On F6, Prairie Grass was sown on the 8th of March into a wet soil (above refill point) and was well established by mid-March when the skies opened-up.

“That site is fairly free draining so honestly the paddock wasn’t too badly affected,” says Adam. “We spun-in another 15kg/ha after the rainfall which means it’s now ready to graze and operate on a 25-30-day rotation through to spring.”

A decision was made to use Prairie to flatten the production curve and ensure winter pastures do not impact the lucerne/chicory crop to maximise summer feed on F6.

F3 had not undergone winter sowing prior to the rainfall event, leaving poor quality silage to be cut from the site when access could be made on the 4th of April. The next day an Italian Ryegrass was sown with a 100kg Sulphate of Ammonia (SOA) application.

“While establishment has been good and I predict first grazing will occur in the next fortnight, I will hit it with another 150kg of urea in the next couple of days as there would have been substantial nitrogen leaching during the flooding.”

Key tool for soil moisture monitoring missing in action

Access to data from the two soil moisture monitoring probes and rain gauge at Kywong Flat was halted during the March rainfall event. Power to the telemetry base station, located in a nearby hay shed, was lost during flooding and it has not been considered a priority to rectify....until now.

“I know all the data is sitting there in the loggers but I can’t access it until the base-station can receive the information and then send it to the online platform for me to view,” says Adam. I know that things are drying and I need to be considering when I need to start-up irrigation again, so it’s now become a priority to get the electrician to site.”

Again, groundwork is needed to get the 50ha pivot operating at Kywong Flat, with the pump pulled from the river during the floods.

“We lost fencing along the river so the decision to do this was a good one. We will also conduct a general inspection of the irrigation system prior to start-up as there may have been some impact to operating efficiency.”

Upcoming considerations

- The Bureau of Meteorology’s prediction for the May to July period is a 75% chance of 200-300mm of rainfall.
- Although SWAN Systems® forecasts 30mm of rainfall in the next 7 days, ETo is still at 25mm. This means that soil moisture in the top 35cm needs to be closely monitored to support good establishment of Italian ryegrass and mixed species.
- Undertaking system checks of the irrigators after the March extreme weather is fundamental to operating safety, effectiveness and efficiency.
- Making informed decisions using weather forecasting tools will be an ongoing requirement this autumn and into winter as Eto declines, to manage conditions.
- Soil Moisture Monitoring equipment is not immune to technical issues. Ongoing maintenance of the equipment themselves is important, as is access to ongoing support in interpretation and use of the data.
- Access Irrigation System Check-lists and soil moisture monitoring equipment decision resources on the Dairy Australia Website: <https://www.dairyaustralia.com.au/land-water-and-climate/water/irrigation/smarter-irrigation-for-profit#.YJR8c7UzaUk>

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