Key points of the February/ March period

- Soil Moisture Monitoring (SMM) was used to gauge the effectiveness of regular medium rainfall events (totalling 235mm) during early February and throughout March. Mid to late February was a dryer period, however, evapotranspiration (Eto) rates were lower than January at 4-6 mm/day.
- The dry, warm conditions of late January restricted water availability to Bowman Farm in early February, allowing only one irrigation of 30mm to be applied, followed by a strong rainfall event of 36mm. Although the forecasted maize crop yield increase was impacted, monitoring soil moisture levels after irrigation & rainfall allowed Tom to confidently continue the crop through until the 23rd of March, delivering a final yield estimated to equal the previous year (yield tests pending). Without monitoring in place, the crop would have been harvested earlier resulting in a yield reduction.
- Rainfall events throughout March resulted in run-off into the Bowman River and reinstated water flows. This now means the option to irrigate and supplement future rainfall as the winter mixed pasture (Rye/Wheat/Brassica), sown on March 28th, is establishing. The aim is to graze within 36 days of sowing.
- Kywong Flat may have considered irrigating during mid to late February on F3 when moisture levels fell below optimal, however, the dry spell was considered an opportunity to cut silage on this paddock which can be prone to water logging. Rainfall events then provided enough soil moisture to increase levels into the optimal range by early to late March, providing a 2nd silage harvest after approximately 25 days.
- Kywong Flat’s F6 was primarily within the lower end of the optimal range throughout the period.

Bowman Farm Soil Moisture Commentary

- There was no available irrigation water at Bowman Farm from the 2nd of February to the end of March.
- Tom used SMM to monitor the plant available water (blue line) to make decisions on when to harvest the maize crop. Early February rainfall and a single irrigation saw soil moisture in the ideal zone, though it trended downwards into the end of February, though not into highly stressed conditions.
- Rainfall events were effective at the rooting depth of the maize crop (Dark Blue line 95cm), though slower to respond than the upper soil levels.
- The aim is to graze the sown mixed pasture after 36 days. Ideal conditions at the time of sowing, with moisture levels in the optimal zone and rising, means that the pasture is off to a good start.
- In order to keep soil moisture levels ideal for growing and nitrogen application, Tom will need to especially monitor levels in the 25cm-35cm zones where the shallower roots of these pasture species will be developing.
- The good news for Bowman Farm is that irrigation can be applied to maintain soil moisture with the reinstatement of water flows to the Bowman River.
Seasonal Summaries for Bowman Farm - Summer Maize Crop/ Winter Rye-Wheat-Brassica pasture

Soil Moisture Graph

- Reporting Period: February/March
- 36mm rainfall event - soil moisture levels rise allowing crop to continue.
- Maize crop harvested as soil moisture below optimal and crops reflect stressed conditions.
- 20mm application with task of available water.
- Rainfall events allowing river to once again flow & soil moisture to rise into near optimal zone. Soil moisture being monitored to make certain rainfall during establishment so that available water can be strategically used if needed.

Stacked Graph

- Rainfall Daily Sum
- Soil Moisture 025cm
- Soil Moisture 035cm
- Soil Moisture 045cm
- Soil Moisture 055cm
- Soil Moisture 065cm
- Soil Moisture 075cm
- Soil Moisture 095cm

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Seasonal Summaries for Kywong Flat - Paddock F3 Kikuyu/ Paspalum pasture

Soil Moisture Graph

- 36mm rainfall event providing good growing conditions for silage production
- Silage Cut 1: Soil moisture low but no irrigation applied as silage down.
- Regular small rainfall events and reducing evapotranspiration gradually increases soil moisture. No irrigation applied.

Rainfall

Stacked Graph

25cm

95cm
Seasonal Summaries for Kywong Flat- Paddock F6 Lucerne/ Chicory pasture

Soil Moisture Graph

- Paddock to be sown 10th April with moisture levels good for establishment (Annual Italian Rye). If conditions dry irrigation will be used strategically at 8mm rates overnight.

- Regular small rainfall events and reducing evapotranspiration keeps soil moisture levels in a near optimal range. No irrigation applied as confidence at this time that SMM data was reflective of observations at the surface.

Rainfall

Stacked Graph

25cm

95cm
Kywong Flat Soil Moisture Commentary

- Irrigation was not applied to F6 and only two 8mm applications made to F3 during the period though the farm was not restricted by water availability. Power considerations are always a factor in irrigation decisions at Kywong Flat.
- The F3 summer Kikuyu/ Paspalum pasture demonstrated good persistence although soil moisture levels were below optimal but above stressed levels.
- With heavier soils F3 is more prone to water logging, so with this in mind, the decision to not irrigate was made to support more ideal machinery operating conditions across the site for silage harvesting.
- Early March rainfall increased moisture levels on F3 rapidly and allowed a 2nd silage cut to be made mid-March.
- The overall trend of soil moisture across F3 throughout March was upwards at all soil depths with rainfall only, resulting in optimal soil moisture for winter pasture establishment in early April.
- F6 soil moisture was relatively consistent across the period with rainfall events the only source of water application and penetrating to 55cm depth in this shallower soil. The area was used for grazing only.
- Both areas will be over-sown with an annual Italian ryegrass on the 10th of April.

April / May Soil Moisture tips

- Bowman and Barrington River water access will be available.
- Both farms will need to keep soil moisture in optimal ranges as winter pasture species establish and to meet aims to graze within 30-40 days of sowing.
- Optimal range within the top layers of the soil profile will be critical as plant roots develop and to optimise nitrogen use efficiency.
- The rainfall outlook for April is 75% chance of 100mm, less than the previous period, but Eto and temperatures are decreasing. This means that small amounts of supplement irrigation will most likely be needed and scheduling of this should be determined using the Scheduling Irrigation Diary tool (water balance calculation using forecasted temperature, Eto & rainfall) along-side the in-situ SMM equipment.
- Both farms will have an irrigation system evaluation undertaken during the next period to assess whether water is being applied efficiently and effectively, including energy saving opportunities relating to pumping water.

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