

Bending with the seasons in Mallee country

Property: Merriwa Pastoral Company

Owners:

Bronwyn and Geoff Hunt, Karen, Bill and John Fenton

Location:

Normanville, Victoria

Farm Size:

1484 hectares, 1436 hectares cropping

Enterprises: cropping and sheep

Average Annual Rainfall:

342 mm

Soil Types:

duplex, clay loam over clay

Soil pH:

8 to 8.5

Typical Crops Grown:

wheat, barley, canola, lentils, oaten hay and field pea hay

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Facing seasonal and climatic variability with resilience and adaptability, one Mallee farming couple 'bend' their approach to crop management based on increasingly sophisticated seasonal forecasting and soil moisture data in north-west Victoria.

There, in this semi-arid region, Normanville growers Bronwyn and Geoff Hunt sharpen their farm business acumen using seasonal knowledge, tools and information drawn from the past, present and future of their 1484 ha property.

As such, the Hunts look to lessons learnt from past cropping seasons and paddock history; up-to-date data collected by a deep soil moisture probe and weather station installed on their property; and information from short and long-term seasonal forecasts. They also look to the findings of on-farm soil core sampling and a web-based decision support tool - Yield Prophet® - that estimates crop yield potential based on predicted rainfall and their soil core test results.

Using this suite of tools, the Hunts say they 'lean' rather than 'confidently step' towards management tactics to help shield their grains operation from a changing climate and variable seasonal conditions, including shifting, and sometimes harsh, weather patterns.

To this end, they routinely measure seasonal forecast

information against on-farm soil moisture and nutrient information as part of an overarching strategy that aims to match crop inputs to growing season conditions and ultimately, maximise farm business profitability.

Turning to 'reliable sources', they refer to subscription-based seasonal forecast commentary, The Break, produced by Agriculture Victoria seasonal risk agronomist, Dale Grey. The Break provides a range of seasonal forecast summary newsletters, comparing forecast models and soil moisture data for three to six months. They also rely on deep soil moisture probe data and commentary released by Agriculture Victoria seasonal risk agronomist Dale Boyd who manages a Victoria-wide network of probes on growers' properties.

The Bureau of Meteorology (BoM) is another trusted source for the Hunts, particularly in terms of its local and state seasonal forecasts, Indian Ocean Dipole and Southern Oscillation Index monitoring, Australian weather watch radar and wind forecasts.

Tracking their strategy through the southern growing season, the couple say: "If the seasonal outlook for April and May indicates there is a 70 per cent possibility of drier than average conditions, we might change our farm management approach at the paddock level."

“With climate change, rainfall is moving out of the growing season so we receive more summer rainfall and less spring rainfall now.”



However, these seasonal outlook predictions are also carefully considered against the farm backdrop of soil moisture and nutrient availability. For example, when data from their soil core sampling and deep soil moisture probe shows subsoil moisture is depleted, the Hunts may opt to reduce the farm’s canola cropping area. However, when the data shows that the soil moisture profile is at least half full, they may decide to increase the farm area planted to this thirsty, deep-rooted oilseed, known to forage for moisture a metre beneath the soil surface. Soil moisture information is also used to identify their wettest paddocks on which they sow canola.

In contrast to this seasonally-flexible approach to their canola country, the farm area sown to wheat and barley remains fixed because these hardier cereals have proven relatively adaptable to variable seasonal conditions.

Sowing Time

To help minimise the unpredictable longer-term risk of heat shock later in the growing season, the Hunts now early sow their wheat, lentils and canola in April, instead of May, and their barley in May, instead of June. Such an approach can increase the unpredictable risk of frost damage, though the Hunts see this as less of a risk than heat shock.

“We sow earlier to help minimise losses from heat shock,

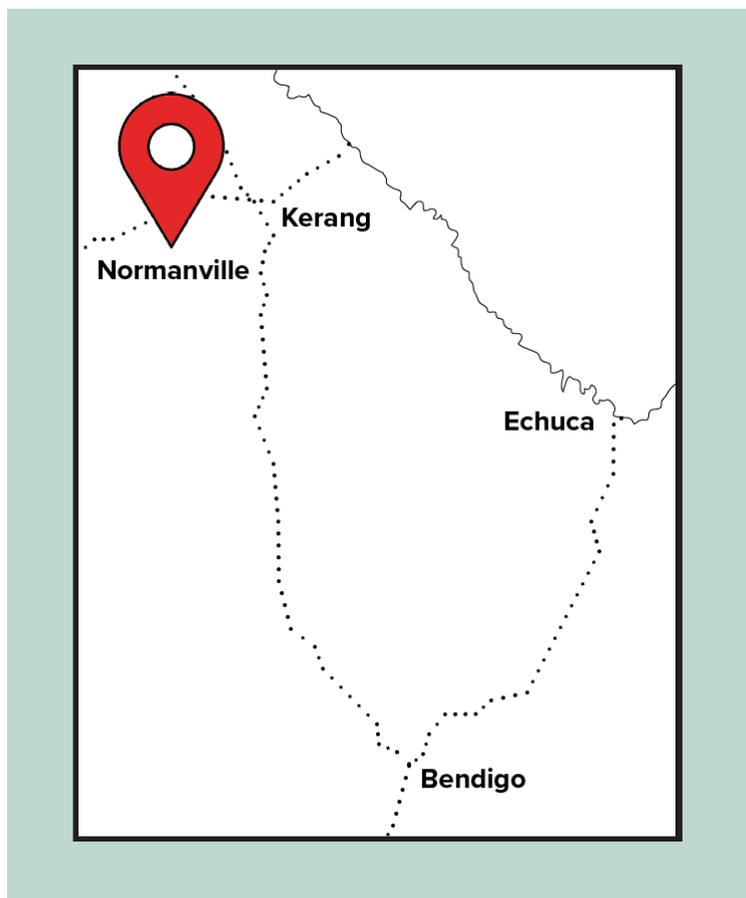
particularly during the sensitive flowering phase, and to help avoid the effect of hot weather towards the end of the season. We can’t avoid both these seasonal challenges, but we can manage risk for them.”

An added benefit of earlier sowing is that it helps to buffer their grains operation from shifting weather patterns in a changing climate – a development reflected in seasonal forecasts, historical rainfall data and their own farm records.

“With climate change, rainfall is moving out of the growing season, so we receive more summer rainfall and less spring rainfall now. Some late-sown Mallee crops were not harvested as a consequence of the dry conditions in the 2018 growing season.”

Moisture Measurement

The Hunts say their management decisions early in the growing season, especially those at sowing, are mainly informed by soil core sampling. They collect six soil cores from each paddock, at increments of zero to 10 centimetres (cm); 10 to 40cm; 40 to 70cm; and 70cm to one metre in the soil profile. These soil core test results, collected in March just before April-sowing, are then entered into the Yield Prophet® decision-support tool and reality checked against measurements from the deep soil moisture probe.



Accompanied by a weather station, sensors in the capacitance probe record subsoil moisture from a fixed location on their property at 10cm increments from a depth of 30cm to one metre in the soil profile. The data, which can be accessed by other growers, is then sent via the mobile phone network to a server for storage, analysis and interpretation using graphing software.

The Hunts prefer their early-season crop management decisions to be guided by known soil moisture parameters because there is a limit to how much they can rely on seasonal forecasts due to the spatial variability of rainfall that fluctuates from farm-to-farm and district-to-district.

“For instance, we received 22 millimetres (mm) of rain on our farm, while the neighbouring property received just 10 mm from the same weather event. The BoM’s local weather watch radar and Agriculture Victoria information sources have highlighted, quite dramatically, how patchy the rainfall is in this area.” Nevertheless, they describe seasonal forecasts as an “important, but approximate guide” that increasingly influence their farm business management decisions as the growing season progresses. For example, acknowledging moisture and nitrogen as their main yield-drivers, they consult seasonal forecasts, in conjunction with Yield Prophet®, soil core testing and probe measurements to help inform their approach to crop nutrition later in the growing season. To minimise the potential for applied nitrogen losses in a “risky production area”, the Hunts generally apply nitrogen fertiliser to cereals as late as possible, just before the end of tillering in late July or early August.

During the prolonged dry conditions in 2018, the Hunts decided not to apply any extra nitrogen to their cropping program; a decision, partly based on the outlook for drier than average conditions that saw them secure better gross margins from moisture-stressed grain and hay enterprises. In contrast, during the 2017 season, they applied about 100 kilograms of urea per hectare to cereals to optimise the productivity and profitability of that year’s bumper crops.

The Hunts also closely monitor the BoM’s Indian Ocean Dipole (IOD) outlook because they have found these climate phases, typically starting in May or June, have a strong influence on their farm’s growing season rainfall. More specifically, a negative IOD phase tends to result in above average rainfall in winter and spring, which provides a cue for the Hunts to consider applying more nitrogen just before the end of tillering. BoM wind forecast maps indicating wind direction and average speed, are one more tool the Hunts use to help guide their herbicide, insecticide and fungicide spraying operations.

The availability of Agriculture Victoria’s seasonal forecasting tools and information, previously limited to growers in Victoria, are now being extended to growers across the southern grains region in South Australia and Tasmania as part of a new GRDC-invested research project.