

**Predicting spring pasture growth using soil moisture probes**

**Demonstration goal**: Use soil moisture data and modelling to predict spring pasture growth, assisting producers to make early decisions and prepare for increasingly variable springs.

**Site location:** Dartmoor, Pigeon Ponds and Baynton

**Producer group:** Glenelg BestWool/BestLamb, Macarthur BetterBeef, Central Ranges Grassland Society of Southern Autstralia

**Agriculture Victoria coordinator:** Jane Court

**Group coordinators:** Andrew Kennedy, Andrew Speirs

**Duration:** 2018–2022

**Predicting pasture growth- what’s out there?**

Can we reliably predict pasture growth for the season ahead? There are several projects that are looking at this as well as some new and developing commercial products available. One of the fundamental questions is around how we can use soil moisture information to make some early predictions about what is ahead and hence plan and act early. We know that the soil moisture bank at the end of winter has a large influence on how much pasture can be grown (a better predictor than the weather forecast). This needs to be reliably predicted and quantified for farmers to use with confidence at a farm level.

An Enhanced Producer Demonstration Site (EPDS) project co-funded by Agriculture Victoria and Meat and Livestock Australia (MLA), is using soil moisture probe information to predict (and validate) spring pasture growth. This demonstration is being run over four sites with producer groups, including Bestwool/Bestlamb; BetterBeef and the Grassland Society of Southern Australia (GSSA). Predictive modelling is being undertaken by Melbourne University, and group coordinators are monitoring ‘actual’ pasture growth to see how it compares.

Another project is being run with Southern Farming Systems and Glenelg Hopkins CMA (through funding from the Australian Governments Smart Farming Partnership Program). This was set up to collect data including pasture growth rates for ‘Pastures from Space’, which used to be widely available but needed some validation in south eastern Victoria. The project is taking pasture cuts and making growth estimations though the growing season on farm sites to help validate existing data. There are other projects and groups also working in this space, including the Perennial Pastures Systems (PPS) group at Ararat.

The Digital Innovation Smart Agriculture (DISA) conference at Hamilton earlier this year provided a snapshot of these projects and participants showed an interest in hearing more about what is available to assist farmers predict pasture production. This led to a webinar in early July, hosted by Agriculture Victoria, GSSA, and Glenelg Hopkins CMA, which featured the following technologies.

Agriculture Victoria provided a snapshot of their state-wide soil moisture probes with publicly available data. Both cropping and pasture sites deliver real time data and provide soil moisture information as well as temperature at 10 cm depth increments. Soil type and pasture/crop species is also available. The information is available at <https://extensionaus.com.au/soilmoisturemonitoring/>

As part of the EPDS project, Brendan Cullen, Senior Researcher at Melbourne University showed the predictive pasture growth graphs, that will be provided monthly this spring to the site hosts and interested farmers at Harrow, Dartmoor, Casterton and Baynton. The graph illustrates an example of predicted pasture growth rates (blue) and actual growth (dots) as measured with some pasture cuts.



*Figure 1: An example of predictive pasture growth curve (and range over time as indicated by shading) and actual growth (dots) as measure in cages on two soil types.*

The Farm Forecaster decision support tool was developed by NSW Land Services, CSIRO and farmer groups to provide a simple dashboard to farmers. It includes a selection of soil moisture probes in selected regions; links these to a modelled pasture predictive function as well as a weather forecast. Farmers in the subscribed areas can log in, choose the closest soil moisture probe, and then get immediate data on predicted pasture growth and weather forecast for that area. It is currently only available to farmers in south east NSW, but the model is set up with estimated costs to expand this to other sites where there is interest and funding.

The Ag360™ software platform developed by University of New England, is the update from ASKBILL that was previously available. It draws on data from the Bureau of Meteorology ACCESS global weather forecasting model, to predict livestock and pasture performance for up to six months ahead. With this information, Ag360™ makes paddock-specific forecasts for rainfall and soil moisture, pasture condition, sheep and cattle live- and carcass weight, condition score and fat cover, wool growth, and stressors like blowflies, worms and extreme weather. It is available for a free trial period but there will be a cost/subscription after this.

CiboLabs, have been working with a range of groups and farmers using satellite assisted forage budgeting. They are providing data on ground cover and pasture biomass (kg Dry Matter/ha) to paddock level about every five to 15 days.  Farmers involved can provide feedback on what is happening on the ground using a simple mobile app to improve estimates for local conditions.

The current and developing technologies and simple dashboards are quite exciting in what they can or will be able to provide farmers for both the situation now (e.g., soil moisture; feed availability) and via predictive tools (e.g., pasture growth; stock performance). Keeping an eye out for what is most suitable, and well validated in your area is the key for making them work and adding value to you.

To access the webinar recording Soil Moisture- Pasture Forecasting; or if you would like to receive the predictive pasture growth rates for any of the EPDS sites mentioned above please contact jane court: jane.court@agriculture.vic.gov.au



