THEME REPORT

The Clonhie community group were interested in learning more about what modern computer software has to offer in the way of both the basic scenario planning and more detailed business planning capability of the software program.

THE CHALLENGE

Grazed grass is the cheapest feed available to ruminant farmers. To maximise profitability the aim should be to convert high quality pasture energy and nutrients into saleable product whilst ensuring there is also enough high quality pasture ahead as the season progresses.

Pasture growth is strongly influenced by environmental factors such as temperature and moisture availability. For production systems seeking to reduce inputs and aiming to maximise grazed pasture in ruminant diets this variability and lack of control in pasture quantity and quality can be challenging. The difference in pasture production between 2018 and 2019 clearly demonstrates the possible ranges of pasture production both within seasons and across years.

Farmax is an innovative technology developed to help iron out some of these production uncertainties and give clarity as to whether there is enough pasture ahead allowing for timely management interventions to match pasture supply and livestock demand, thereby maximising profitability.

The Farmax software system accurately models the whole biological grazing system of a farm. It is used to both monitor an existing plan and to identify/evaluate the opportunities within a farm system to maximise productivity and profitability from pasture (modelling). This report relates to the monitoring aspect of the software.
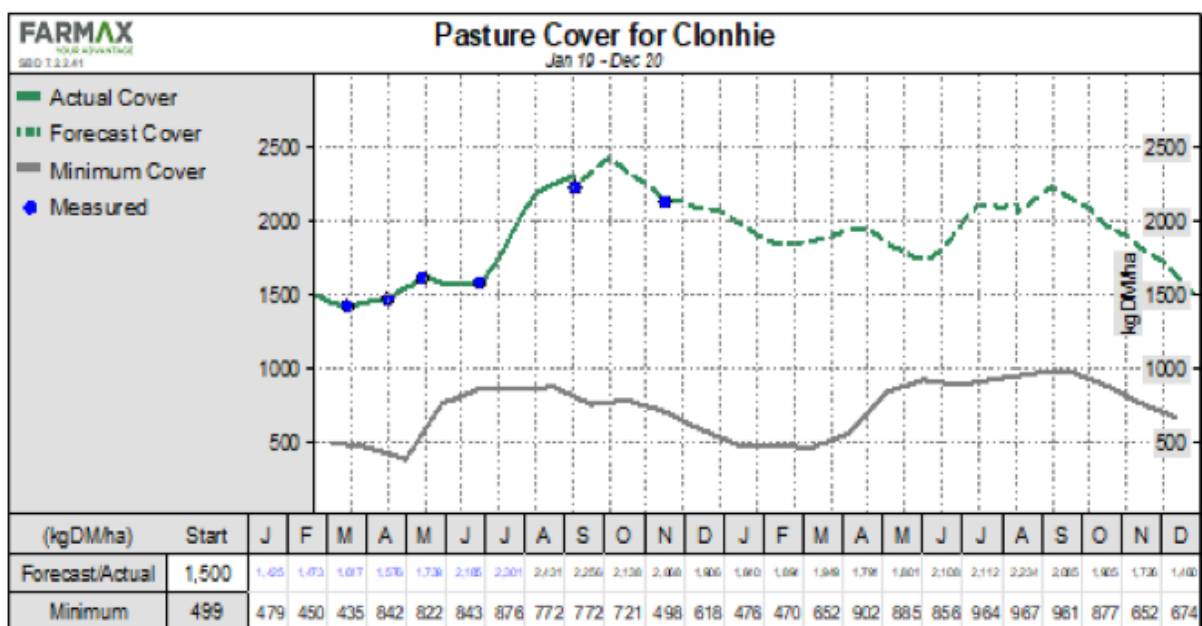
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WHAT WE DID ON FARM

The first stage of using Farmax is to build the model of the farm. This is based on a range of information provided by the farmer, which includes stock numbers and weights, lambing and calving dates, grass growth, dates and rates of fertiliser use, forage production and feed out, purchased feed, sale dates and weights etc. Default files from Farmax are used where actual data is not yet available (e.g. for grass growth). Emily Grant from Forrit (Consultants) set up the model with input from Andrew.

Based on the information supplied, Farmax can predict pasture production against livestock requirements up to two years ahead, although it's likely that you'd only be looking one season ahead. Once the initial model is set up, data on actual pasture supply and livestock numbers and weights needs to be entered regularly (usually every three to four weeks) to allow the model to accurately compare [monitor] predicted against actual [grass growth rates and livestock performance].

THE RESULTS

For Clonhie, the business is still developing, so stock numbers are building. 2019 has also been an exceptional pasture production year so the model is showing that pasture supply is well ahead of livestock demand. As the graph1 shows, where the grey line is the minimum pasture cover [amount needed to feed the stock on the farm] and the green line is actual or predicted supply - without any management or stock changes Clonhie is not likely to run short of pasture supply this spring or through 2020. In early 2020, winter measurements and stock numbers will be entered and a review undertaken to see if reductions in feed purchases or nitrogen applications might be feasible to reduce costs.

Graph1: showing Farmax prediction of grass growth and minimum grass cover required to feed existing livestock on the farm

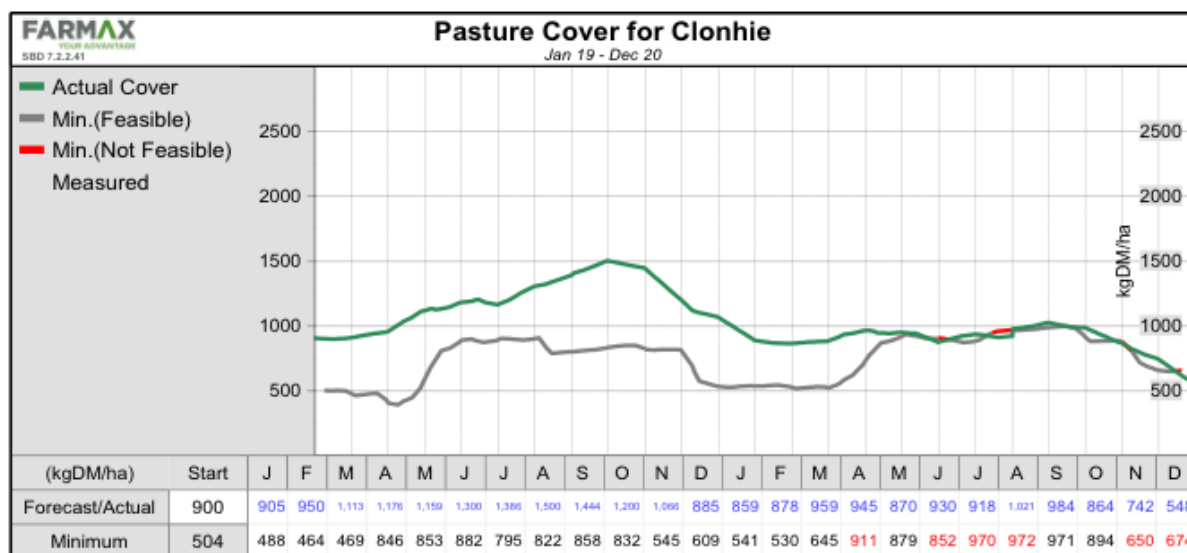| (kgDM/ha)	Start	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Forecast/Actual	1,500	1,425	1,473	1,617	1,576	1,738	2,185	2,301	2,431	2,256	2,138	2,008	1,906	1,960	1,891	1,949	1,798	1,801	2,108	2,112	2,234	2,085	1,985	1,736	1,460
Minimum	499	479	450	435	842	822	843	876	772	772	721	498	618	476	470	652	902	885	856	964	967	961	877	652	674

For the purposes of this report, the pasture cover measurements in Graph2 below have been reduced to demonstrate how the model can be used in times of slower growth. Remodelled with lower pasture supply, looking ahead into 2020 the model predicts that there will be insufficient pasture in April, June, July, August, November and December 2020. This is where the minimum pasture cover for production is not met [shown in red]. Knowing this information in advance allows for management to be amended and plans made ahead of the issue arising.

Graph2: showing a reduced prediction of grass growth against the same minimum grass cover required to feed the livestock on the farm. Times of grass shortages are shown in red.

Pasture Cover for Clonhie — Jan 19 - Dec 20

(kgDM/ha)	Start	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Forecast/Actual	900	905	950	1,113	1,176	1,159	1,300	1,386	1,500	1,444	1,200	1,066	885	859	878	959	945	870	930	918	1,021	984	864	742	548
Minimum	504	488	464	469	846	853	882	795	822	858	832	545	609	541	530	645	911	879	852	970	972	971	894	650	674

In this case some supplementary feed, timed nitrogen application or a reduction in stock numbers would help avoid running out of pasture. Farmax effectively works like a crystal ball to predict pasture supply ahead. This is hugely valuable in terms of deciding on the best course of action if the system looks like there is insufficient, or too much pasture ahead. With financial data in the model too, it can then be used to decide on the most cost-effective solution to tackling the issue. However, it is only as good as the data provided and in order to get maximum benefit it is reliant on entering regular and accurate records of pasture growth and livestock numbers and weights.

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WHAT ARE THE PLANS FOR FARMAX AT CLONHIE?

The more data that is put into Farmax the more accurate the model and the monitoring will be. Every year and season vary in terms of pasture growth, so over time the model will learn, further improving accuracy. More data will be added to the model as the season progresses and the Monitor Farm Programme draws to a close.

This trial will continue until the Monitor Farm Programme ends in Spring 2020 and although current data suggests that supply of grass will be plenty, Farmax will provide a clear idea of pasture supply for the 2020 season and highlight any potential feed or fertilizer cost savings which might be viable.

Part 2 of this trial is using Farmax as a scenario planning tool to evaluate enterprise and management changes which could improve supply / demand balance and overall performance and profitability, which is covered in another Nithsdale Monitor Farm Theme Report "Farmax Modelling 2 of 2".

FACILITATOR CONTACT DETAILS

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