THEME REPORT

NITHSDALE MONITOR FARM

Farmax Monitoring – 2 of 2

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

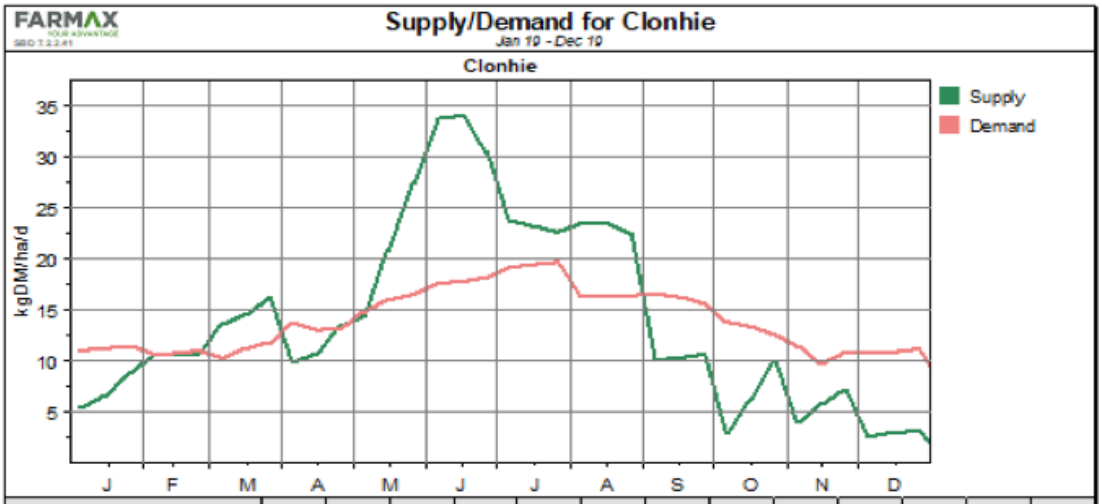
The first stage of using Farmax is to build the model of the farm. This is based on a range of information provided by the farmer, which includes stock numbers and weights, lambing and calving dates, grass growth, dates and rates of fertiliser use, forage production and feed out, purchased feed, sale 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.

Once the initial file was set up, Farmax was used to identify changes to enterprises that might better match pasture supply with stock demand. E.g. adjusting cattle, sheep and deer numbers, changing lambing or calving dates or growing forage crops. Farmax reports on the changes, both for livestock performance and financial outcome thus allowing the most profitable scenarios to be identified.

THE RESULTS

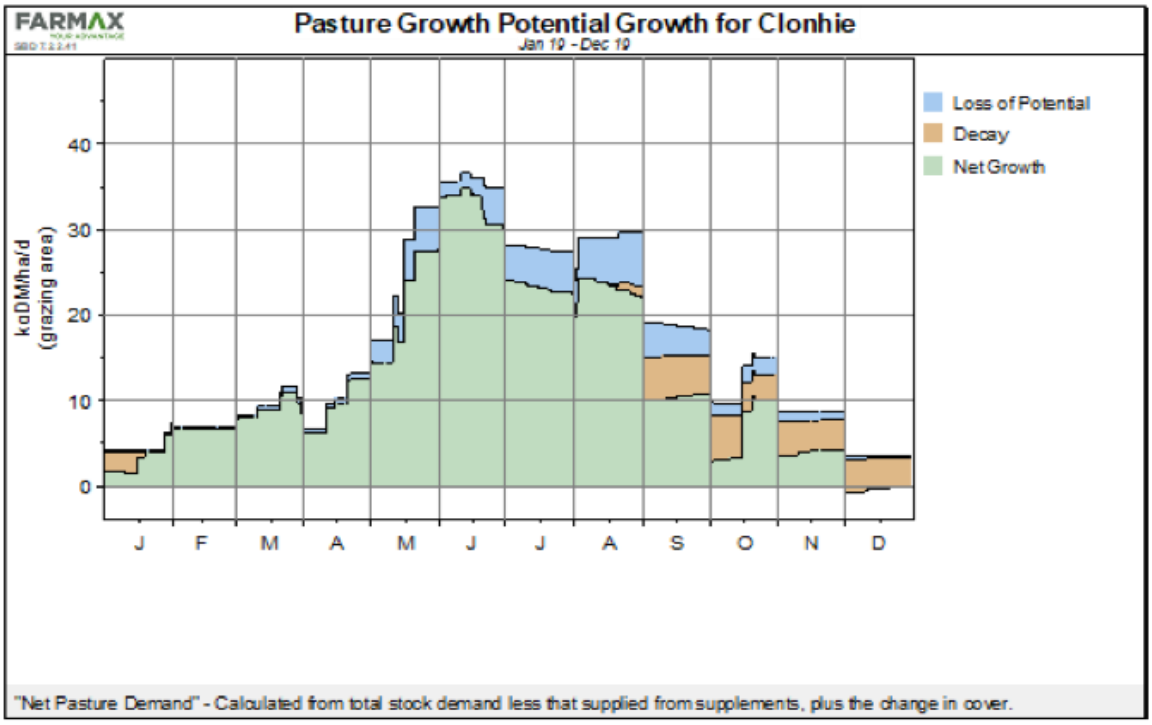
Having built the model, Graphs A and B below show a visualisation of what current supply and demand is on the unit. Farmax provides a variety of reports, and we can see in the graphics below that Clonhie (like many Scottish livestock farms) struggles to deal with the rapid late spring grass growth rate. This leads to a loss in pasture quality during the summer, which is often carried forward into winter and is a potential loss of production, suggesting that changes to the system to deal with that summer peak will lead to increased productivity and profitability.

Graph A: Current Clonhie grazing supply and demand



Supply (kg DM/ha/d)		Jan 19	Feb 19	Mar 19	Apr 19	May 19	Jun 19	Jul 19	Aug 19	Sep 19	Oct 19	Nov 19	Dec 19	Avg.
Pasture	Clonhie	3.0	6.6	9.1	9.4	20.8	32.8	23.2	23.2	10.4	6.5	4.0		12.4
Forage & Feed	Clonhie	4.0	4.2	5.7	2.0						0.1	1.7	3.4	1.7
Total	**Clonhie**	**7.1**	**10.8**	**14.9**	**11.4**	**20.8**	**32.8**	**23.2**	**23.2**	**10.4**	**6.6**	**5.7**	**3.0**	**14.2**
Demand (kg DM/ha/d)		**Jan 19**	**Feb 19**	**Mar 19**	**Apr 19**	**May 19**	**Jun 19**	**Jul 19**	**Aug 19**	**Sep 19**	**Oct 19**	**Nov 19**	**Dec 19**	**Avg.**
Sheep	Clonhie	6.0	5.6	6.0	9.9	9.8	10.4	11.2	8.6	8.4	5.9	4.1	4.4	7.5
Beef	Clonhie	3.6	3.6	3.6	1.9	4.1	5.1	5.4	5.2	5.1	4.6	4.0	4.3	4.2
Deer	Clonhie	1.7	1.6	1.6	1.6	2.0	2.5	2.8	2.8	2.8	2.8	2.7	2.3	2.3
Total	**Clonhie**	**11.3**	**10.8**	**11.2**	**13.4**	**15.8**	**17.9**	**19.5**	**16.5**	**16.2**	**13.3**	**10.7**	**11.0**	**13.9**

Graph B: showing potential pasture growth at Clonhie with lost/unused grazing [blue] and wasted grazing [brown]

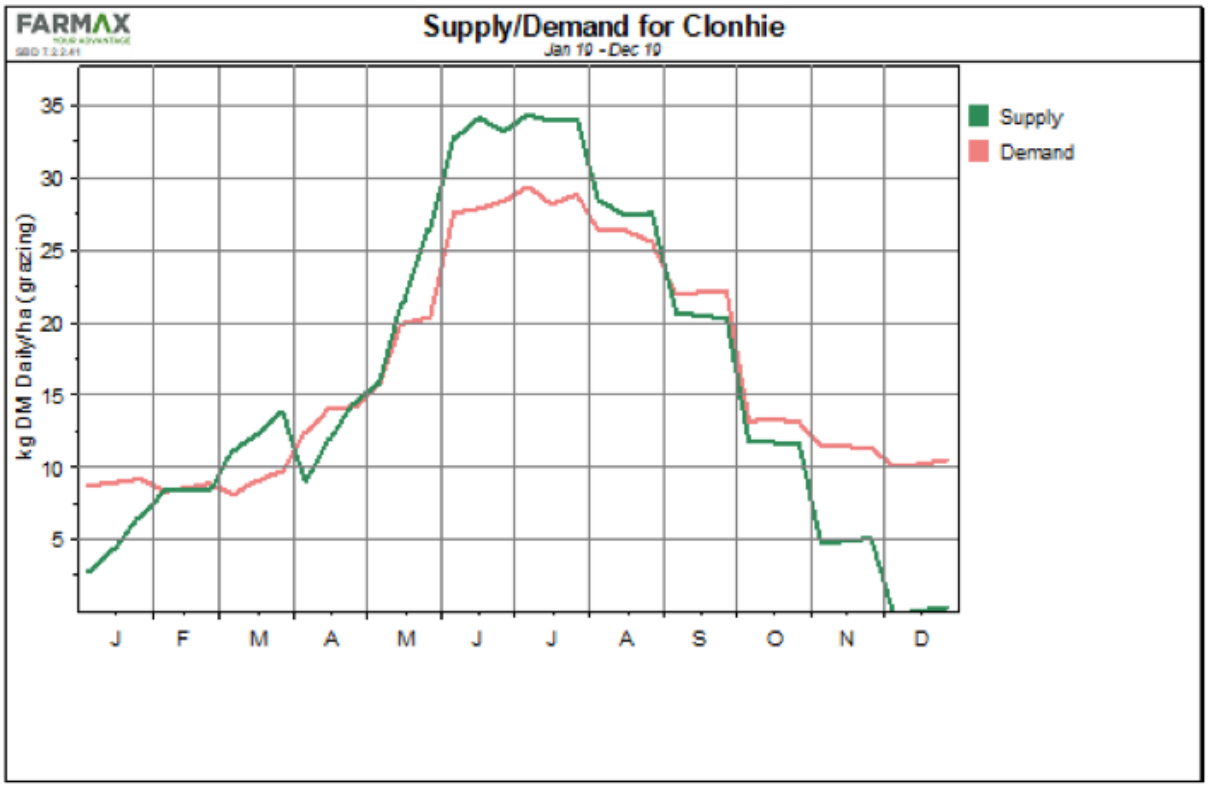


A variety of changes were made to the base model to try and match supply and demand as closely as possible. The main aim was to reduce that peak late spring/summer supply. A reasonably good fit was made by;

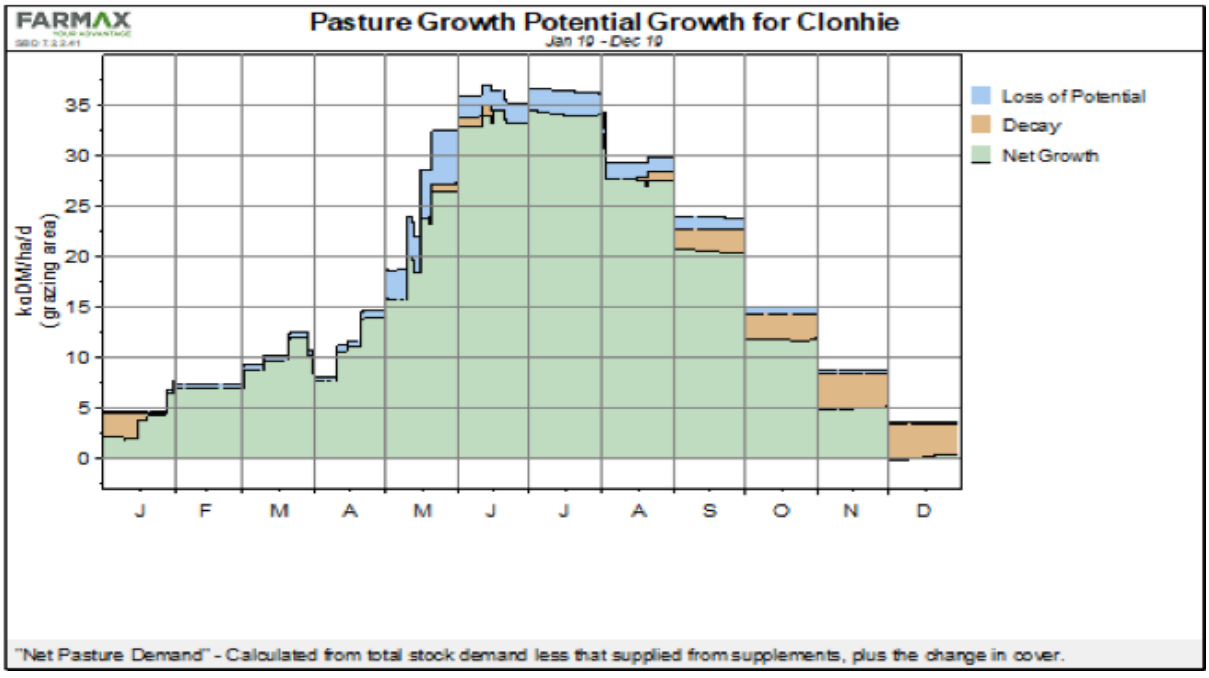
- Increasing ewe scanning rate to 168%, with 150% weaning (the flock is currently being improved)
- Reducing fertiliser input onto grazing ground from 34Kgs N/ha to 20Kgs N/ha
- Applying the fertiliser to silage ground a week earlier and reducing the rate from 65Kgs N/ha to 35Kgs N/ha
- Increasing the number of summered heifers from 95 head to 150 head
- Bringing the heifers onto the unit a week later (7th rather than 1 May)
- Sending the heifers home earlier (1st October rather than 10th November)
- Increasing Deer scanning rate to 95%
- Increasing the area made into baled silage from 3ha to 10ha (and feeding this to the deer)
- Doubling the area of deferred grazing and weaning ewes onto this ground

These changes result in the more effective use of pasture as shown in Graphs C and D. Net pasture growth increases 15% from 4,423Kgs DM/ha to 5,079Kgs DM/ha. Profitability also more than doubles from £169/ha to £378/ha (please note some of the financials are default values in the Farmax model - the scale of change is more important than the actual numbers).

Graph C: showing improved matching of supply & demand through proposed changes



Graph D: showing improved pattern of unused and decaying pasture for the proposed changes



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The list above provides an 'ideal' scenario. Some of the opportunities have already been identified as part of the business development (such as increasing scan rates), but others, such as increasing summered cattle numbers, and changing dates on/off may be harder to achieve. But, the scenario planning shows what is possible and where important early gains can be made. It also allows alternative opportunities (e.g. on dairy heifers, rather than beef) to be identified and compared.

WHAT ARE THE PLANS FOR FARMAX AT CLONHIE?

The more data that is put into Farmax the more accurate the model and the scenario planning will be. Every year and season varies in terms of pasture growth, so over time the model will learn, further improving accuracy. 2019 has been a very productive year in terms of pasture growth, and a complete contrast compared to 2018. More data will be added to the model as the season progresses and the Monitor Farm Programme draws to a close. This part of the trial is using Farmax to scenario plan/ tweak the system and identify opportunities as Andrew and Aileen continue to build the business to ensure they are maximising productivity and profitability. The next stage is for Andrew and Aileen to select and implement the best option/s that they consider to be achievable; particularly in terms of labour and capital availability.

Farmax can also be used as a monitoring tool to predict and monitor seasonal variations in grazing supply & demand, which is covered in another Nithsdale Monitor Farm Theme Report "Farmax Monitoring 1 of 2"

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The Scottish Government | The European Agricultural Fund for Rural Development: Europe investing in rural areas | SRDP Scottish Rural Development Programme