Alwinton Farm: Farmax summary

Aim: Whole farm feed budget to determine how efficiently feed is being utilised at Alwinton farm

Why: Feed budgeting can ensure the cheapest feeds are used most efficiently to reduce cost of production

Farmax®: Farmax software was developed in New Zealand to help farmers analyse their current feed situation and plan ahead where feed surpluses and deficits are forecast

Farm data collection: Philippa Seccombe provided grass cover measurements, animal liveweight and census, field management information and supplementary feed details on a monthly basis from August 2013-October 2014 to input into the model

Limitations:

1) Estimation of grass cover on the hill is based on eleven measurements that are deemed representative of the hill (313ha), this is not the most accurate method but was the most practical solution, we need to develop a practical method to measure grass accurately on upland farms;
2) Accounting for difference in quality – reeds and stems would skew the measurements, therefore Philippa made notes and the figures were adjusted;
3) Financial information – input cost and output price can be input into the model to determine how management decisions impact profitability. We did not input this information for the purpose of this project;
4) Animal liveweights – most of the weights entered were estimated based on farmer experience. Accuracy could be improved by weighing a sub-sample of the flock on a regular basis and including sale weights.

Results

The model indicates tight feed supply in February (13 grass cover measurements, 560-1520 kg DM/ha) and April (14 grass cover measurements, 900-1766 kg DM/ha) (fig.1). Low grass covers drive the February situation, heavily influenced by the hill measurements. In April, the increased flock demand at lambing is also coming onto play.

Later on in the year a surplus of grass is building. In September, the model estimates that over 900kg DM/ha will not be required. The flock were not receiving supplementary feed at this time except for the stock tups and young tup lambs and shearings. This indicates a potential to reduce supplementary feed in November and December.

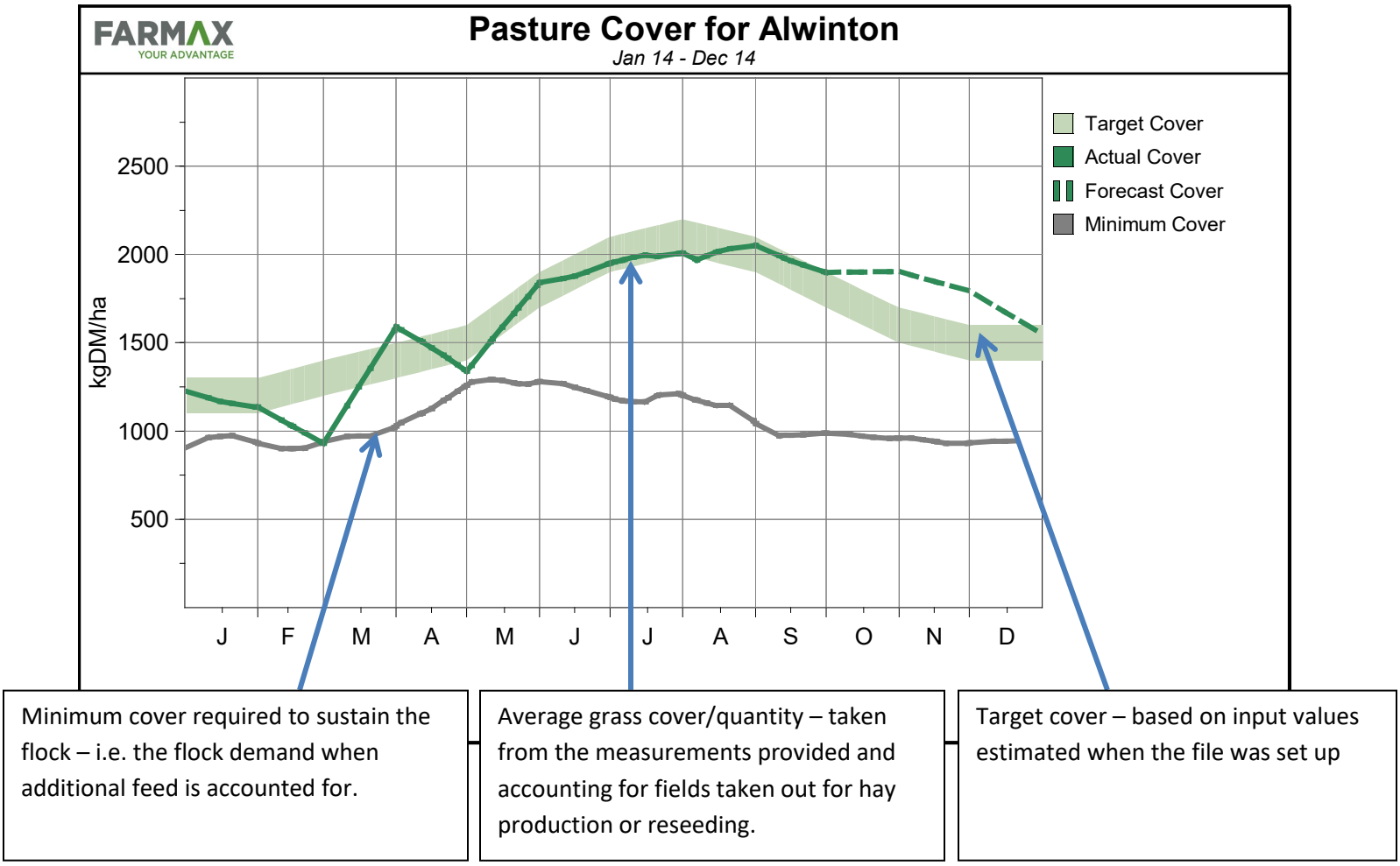

Figure 1: Alwinton farm pasture cover: minimum cover required, targets and actual measurements for 2014

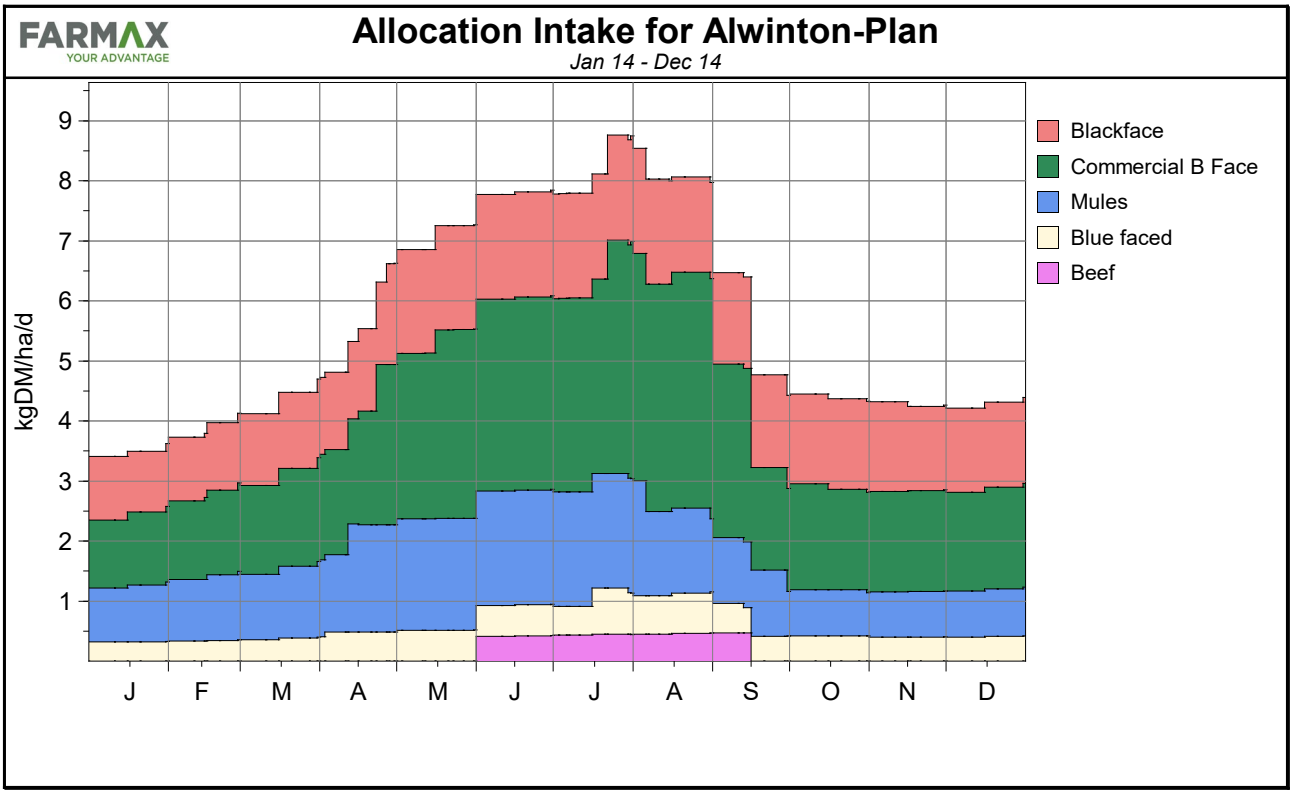

Figure 2: Alwinton farm flock demand for the various groups of livestock during 2014

Flock demand for the different groups of stock peaks at just under 9kg DM/ha/day in July/August before lamb sales commence (fig. 2). Pasture growth from May - August is estimated at around 15 kg DM/ha/day suggesting there is scope to increase grazing pressure during this period.

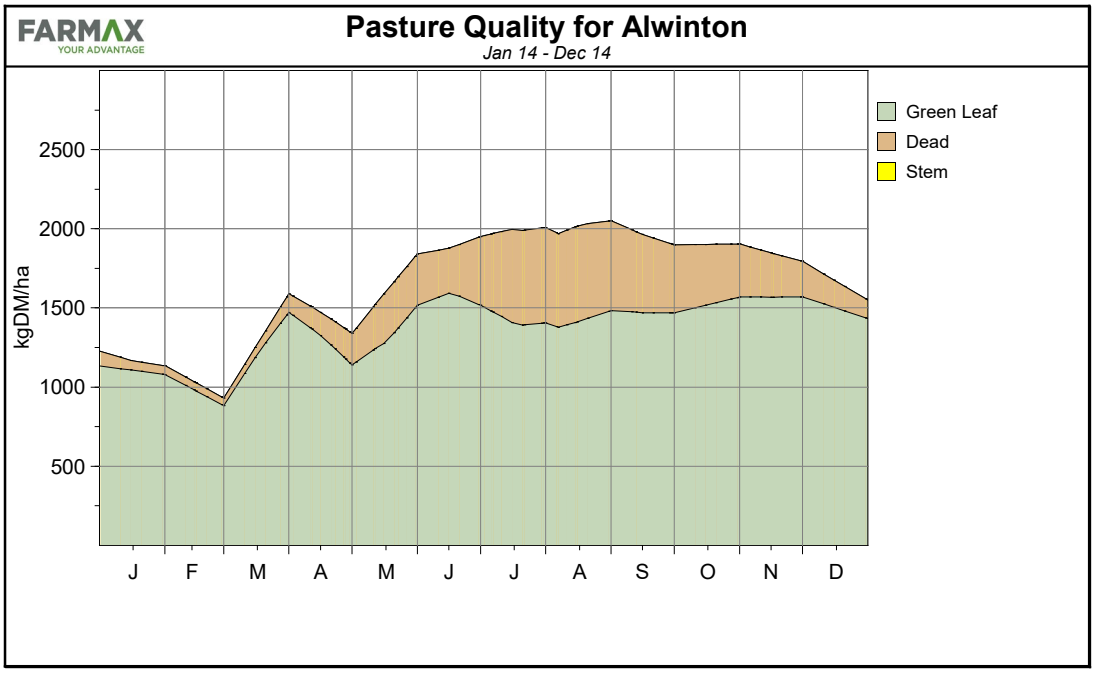

Figure 3: Alwinton farm pasture quality predictions during 2014

As the pasture covers are on target (fig.1), the quality is being managed quite well as modelled in figure 3. If the pasture covers were too high then a lot more stem would be building in the model. Any discrepancies between this graph and field observations indicate inaccurate grass covers inputs. It has not accounted for topping.

Table 1: Ewe physical performance figures

Tupping Body Wt (kg)	67.9
Average Birth Date	19-Apr
Scanning %	204
Losses (% Scanning-Tailing)	6.5
Tailing %	190
Losses (% Tailing-Weaning)	2.2
Weaning % - Overall	186
Survival (% Scanning-Weaning)	91.5
90 Day Weaning Wt (kg)	27
Avg. Growth to Weaning (g/d)	245
Ewe Efficiency	74

With high scanning and low mortality in 2014, the physical performance figures are favourable (Table 1). Ewe efficiency is calculated by multiplying the average 90 day weaning weight (kg) by the weaning percentage, and dividing it by the average ewe weight at tupping (kg). Therefore a 27 kg weaning

weight x 1.86 lambs weaned per ewe put to the tup divided by 67.9 kg ewe weight equals 74%. It is a measure of the kg of weight she weans for every kg of her weight. In NZ, the target would be 70% or above. The accuracy of this data could be improved with ewe and lamb weights.

Table 2: Grass utilisation

	Alwinton farm	English farm averages (range)**
Standardised stocking rate* (SU/ha)	3.7	11.1 (4.6-16.0)
Tonnes DM eaten/ha	2	6.5 (2.6-9.6)
Demand from supplements (%)	3.4	26.3 (7.3-45.3)
Net product (kg/ha)	83	239.6 (119-457)
Feed conversion efficiency	24.7	28.5 (19.2-38.0)

* One stock unit is a 55 kg ewe rearing 1.2 lamb

** Eight English lowland farms modelled using Farmax 2012-13, see http://www.eblex.org.uk/wp/wp-content/uploads/2013/04/farmax_phase_i__-_final_report.pdf for further information.

Alwinton farm has a low stocking rate compared to other English lowland farms (table 2), which is to be expected to some extent as it is an upland farm. As a consequence, the net product (kg/ha) and tonnes eaten/ha are lower. Feed conversion efficiency – the amount of kg DM needed to produce a kg of product – is also lower (i.e. better), so although the system it is more extensive, the animals utilise the grass nutrients well, which is reflected in the performance figures in table 1.

Concluding remarks

Over the year, EBLEX and Philippa (Legume Bonus project manager) have developed a process to collect data to input into Farmax software to model the farm system. This has been challenging, due to the different mindset required to look at a livestock system in this way, but in the end, the process was successful.

The figures developed must be interpreted with caution, due to the hill measurements and livestock weights. They reflect the extensive nature of the system. Summer grass production has some potential to increase stocking rate but winter capacity will limit options.

With one year of data collection and the scope of the data collected, this project has not explored all the capabilities of the software. With financial information, the model could be used to understand how management and utilisation of pasture impacts on profitability.