Winter Forage Crop Case Study

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Michael Shannon, Thankerton Camp

Thankerton Camp Farm lies at the foot of Tinto Hill on the outskirts of Thankerton in South Lanarkshire. Michael Shannon farms 215 acres of LFA improved grassland alongside his wife and children. Michael established Damn Delicious, farm shop and butchery in 2008 which is located in the heart of the farm and retails the produce reared on the farm.

Michael runs a simple yet intensive system, finishing around 300 cattle each year alongside a small flock of 70 crossbred ewes. The cattle are primarily Aberdeen Angus with some Shorthorns and Luings. They are purchased as stores between 12-18 mths of age and are finished between 24-28 mths with 150 currently going through the farm shop. The target is to increase this to 300 next year.

The main focus for Michael is to finish all cattle off grass with no concentrates to produce high quality grass fed beef for the farm shop. The cattle are grazed though a rotational grazing system during the summer and graze forage crops during the winter. The fodder crops are used to reduce winter costs and provide added value to the beef being 100% forage fed. The sheep are set stocked with all lambs finished off grass for the farm shop.

Forage Crops at Thankerton

Michael has been growing forage crops as part of his rotation for 18 years and routinely grows 3 forage crops—Swift, Swedes and Kale for winter feed. The Swift and Kale crops are sown with a power harrow into sprayed off pasture that has been disced. The Swedes are sown into a ploughed seed bed. The soil is analysed in the spring with any nutrient deficiencies corrected before sowing, aiming for a pH of 6.2. Two varieties of Swedes have been grown this year as a trial. Triumph is the preferred option as it retained the leaf well, however Kenmore has also been sown this year in an attempt to achieve a greater yield from its characteristically larger bulb. The crop analysis taken in October has shown that the crude protein and energy content of the Kenmore variety is higher than the Triumph as shown in the table below.

	Triumph	Kenmore
Dry Matter	10.8%	10.6%
Crude Protein	12.6%	14.5%
ME	13.6%	14.1%

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Forage Crops at Thankerton

The forage crops at Thankerton Camp were weighed on the 12th October. Multiple sample sites were selected randomly across the field, with a 1m² quadrant used to measure out each plot. The Swift and Kale were cut and removed with the Swedes being pulled to measure bulb and leaf from each site. The samples were weighed in a feed bag to get the fresh weight per m² and an average FW yield was taken from all plots. The dry matter yield was calculated by using the standard book values, however we also sampled each crop for a more accurate feed budget. Using actual dry matter figures indicated there were 23.5 tonnes less than estimated.

Forage Crop	Crop Area	Average Fresh Weight (kg/m2)	Fresh Weight (kg/ha)	Estimated Crop Dry Matter Used	Estimated Yield of Dry Matter (tonnes)	Actual Crop Dry Matter	Actual Crop Dry Matter Yield (tonnes)
Swift	5.62	7.90	79,000	12.5%	55.5	8.5%	37.7
Swedes	2.88	10.80	108,000	11.5%	35.8	10.7%	33.3
Kale	2.37	3.23	32,300	15%	11.5	10.7%	8.2
				Estimated Yield	**102.7**	Actual Yield	**79.2**

Feed Allocation

Michael's winter forage system targets a liveweight maintenance ration as he aims to achieve a high compensatory growth rate of >2kg/per day in the spring on the rotational grazing system. Michael estimates daily allocation from a typical crop yield to allow him to space bales out earlier in the year'. The area available to cattle each day contains 81% Swift and 19% Swedes with one silage bale in the middle until the new year when it will be 75% Kale and 25% Swedes with one silage bale. The Swift is grazed first due to the higher losses incurred with grazing a Rape hybrid in late winter due to its low tolerance to frost, whereas Kale has a higher tolerance to frost. This system allows cattle to utilise the high protein from the leafy crops whilst getting high energy from the root crop. 70% of the cattle's diet is forage crop which is then balanced with 30% from the long fibre in the silage bale. Calculating the dry matter available within the daily allocation area will determine the size of group that can graze the crop throughout the winter.

	Swift	*Swedes*
A) Crop Area Available per day (m²)	600	140
B) Total Crop Yield (kg)	4,470	1,512
C) Total Dry Matter Available (kg)	402.9	161.8
D) Crop Utilisation	90%	95%
E) Total Utilisable Feed Available (tDM) (CxD)	362.6	153.7

There is a total of 716.3kg of dry matter available each day including the 200kg from forage. The cattle are an average liveweight of 400kg and therefore require 11kg DM/head/day (2.75% of liveweight). There is sufficient feed for a group of 65 cattle. This will be reviewed as the cattle transition to the kale and swedes area.

All feed budgets should be reviewed regularly to ensure livestock are receiving adequate nutrition as factors such as weather and crop variability across the field can affect the crop available. Weighing cattle is the most accurate way to ensure growing or fattening cattle are achieving the desired daily liveweight gain.