

# Grassland Production & Utilisation

Nether Aden  
Climate Change Focus Farm

Notes from the meeting on  
17th Mar 2015

*This meeting was the third in a series of Climate Change Focus Farm events linked to Nether Aden farm near Mintlaw, aiming to increase farm profitability and lower the farm carbon footprint. Working with hosts David and Nicola Barron, plus industry specialists, the farmer discussion group will investigate a range of practical and profitable ideas.*

**The meeting focussed on grass, systems and methods for increasing production and improving the level of utilisation of the grass that is actually produced.**

**Our two invited speakers for the event were Rhidian Jones, a beef and sheep specialist with SAC Consulting, and Michael Shannon, a farmer from Lanarkshire who has incorporated New Zealand grazing techniques into his beef finishing enterprise.**

## Yield potential

There is a tremendous variation in the yield of grass produced from different farms.

The potential dry matter yield will vary depending on the site class and the level of fertiliser applied eg an average site would have a yield potential of 5,500 kg dry matter per hectare if no nitrogen was applied, but the yield potential would increase to 10,500 kg dry matter per hectare at 250 kg per hectare of nitrogen.

White clover in the sward will also have a significant effect on the yield potential eg a sward with perennial ryegrass and 20% white clover would have a yield potential of 7,500 kg dry matter per hectare with no nitrogen applied. The response of grass to nitrogen fertiliser is almost linear up to 300 kg per hectare, after which diminishing results will be achieved.



# Re-seeding

Re-seeding can potentially almost double dry matter yields. The aim must be to produce at least 10 tonnes per hectare dry matter and to use at least 80% of it. When considering re-seeding, look at the age of the sward and the percentage of sown species remaining. New varieties on average have been increasing yield by approximately 1% per annum. It is very important to get the basics correct when re-seeding – soil structure, drainage, pH, phosphate and potash. Every 1 tonne per hectare of dry matter produced has the same energy as 1 tonne of barley (and the grass has a higher protein level).

New varieties tend to give a longer growing season. They tend to start growing earlier in the spring and grow later in the autumn. Recent assessments on a farm comparing an old sward and a new sward had shown a dry matter yield at 14 May of 2,700 kg per hectare for a new sward, but only 1,100 kg per hectare for the old sward. Newer varieties also tend to have a better response to nitrogen. Every 1 kg of nitrogen per hectare will give between 15-25 kg of grass dry matter.

Reseeding with newer varieties will give better quality grass – higher digestibility, higher intake, higher protein. Perennial ryegrass will have a grazing D value of 75 but weed grasses will be in the region of 55-65. Increasing the D value of the sward by 1 unit should give up to an additional 40 grammes per day LWG in cattle and 20 grammes per day LWG in lamb.

# White clover & high sugar grasses

Including 30% white clover in the sward will fix the equivalent of 150 kg nitrogen per hectare per year. White clovers increase the digestibility of the sward, give higher intakes and have a higher protein content compared to perennial ryegrass. This potentially gives an increase in growth rates of 20%.

Higher sugar levels in grass results in more energy for the livestock. Intake from these grasses tends to be higher and they improve the efficiency of nitrogen use. In trials these grasses have produced increases in LWG in cattle up to 200 grammes per day.

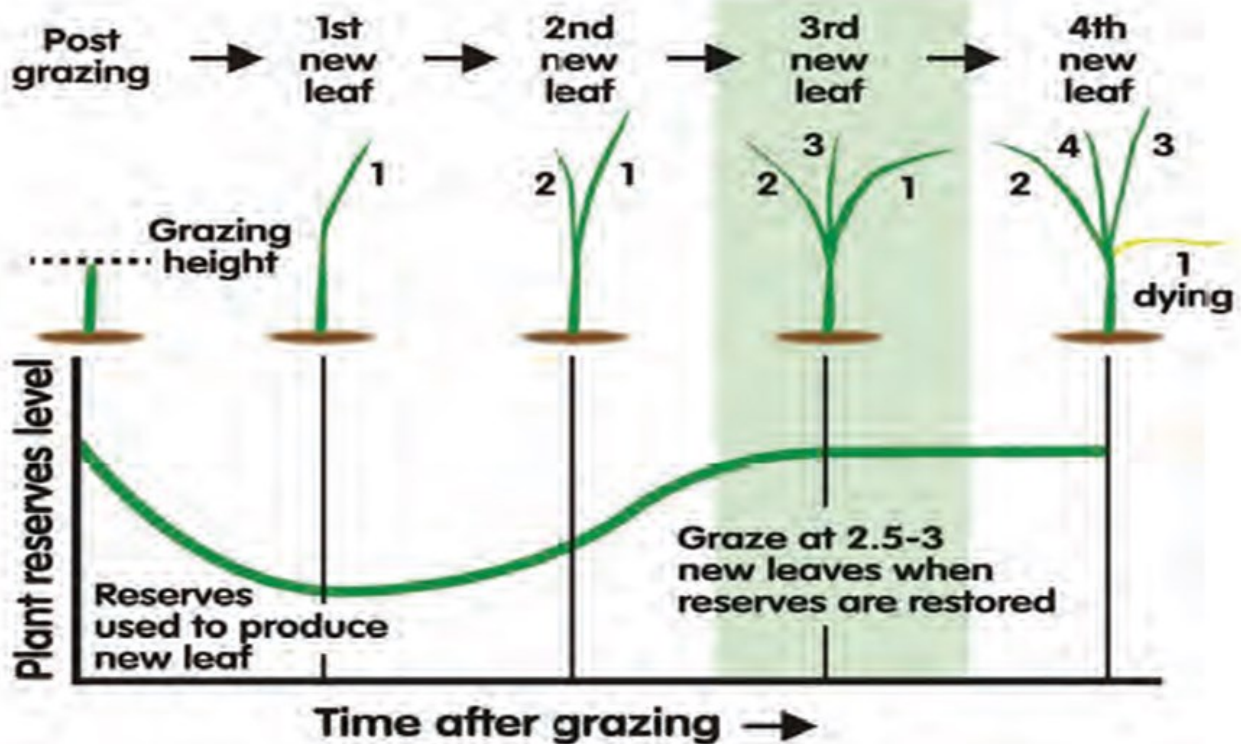


# Grass Utilisation

Set stocking systems will typically utilise 50-60% of the dry matter grown. Rotational grazing systems improve yield, utilisation and grass quality. They require stock to be moved on a regular basis, have higher fencing and watering costs, are flexible, maintain better quality grass for longer and increase overall yield.

System	Yield (t DM/ha)	Utilisation (%)	Usable Yield (t DM/ha)	Percentage Increase (%)
Set stocking	8.5	50	4.3	
Rotational	10.2	65	6.6	56
Paddock	10.2	80	8.2	96

# When to graze grass



Perennial ryegrass only really supports three leaves. If there is not an existing leaf on the plant, the first thing it must do is produce the first leaf. The plant has to use its reserves to do this. Under a continuous grazing system, plants can be continually grazed and may not have produced sufficient leaves to replenish the reserves.

With rotational systems, the plant has time to put up the first leaf and by the time the stock are rotated back to this field it should have three leaves and have been able to replenish the reserves. A perennial ryegrass plant will only support three leaves therefore, once the fourth leaf is produced, the first leaf will die off. This is a waste, reduces the efficiency of production and reduces the liveweight gain of the stock. At the peak of the grazing season, it will only take approximately two weeks between grazing and the plant getting back to the 4 leaf stage. Later in the growing season this will take longer.

## Sward height guidelines for cattle



		Pre Graze (cm)	Post Graze (cm)	Set Stock (cm)
Lactating Sucklers	Turnout - April	10 – 14	5 – 6	5 – 6
	June – July	12 – 15	7 – 8	7 – 8
	Aug – Nov	12 – 15	8 – 9	7 – 9
Growing/Finishing cattle	Turnout – May	10 – 12	5 – 6	5 – 6
	June – July	10 – 14	6 – 7	6 – 7
	Aug - Sept	10 – 15	7 – 8	7 – 8

# Practicalities of a rotational grazing system—Michael Shannon

Michael Shannon farms 250 acres in Lanarkshire, finishing bought in cattle of native breeds (Aberdeen Angus and Shorthorns) on a 100% forage based system – grass in summer, kale and silage in winter.

He sells approximately 90-100 cattle through his on farm shop and his online business. Surplus cattle are sold through the abattoir.

After a visit to farms in New Zealand some years ago, Mr Shannon set up his forage based finishing system based on rotational grazing. His on farm rotation is as follows:-

**Year 1** - Silage followed by swift or kale

**Year 2** - Cereals undersown

**Year 3** - Grazed with sheep

**Years 4 to 7** - Grazed with cattle



## Why use a rotational system?

Grazed grass is the cheapest way for livestock to put on weight.

Grazed grass costs £30 - £40 per tonne of dry matter. Between 10-15 kg of grass dry matter is required for 1 kg of liveweight gain.

It therefore costs between 30p and 60p per kilo gained at grass if it is well managed and the grass quality is high.

The system itself is easy to set up and manage, while it also maintains grass quality for longer.

Cattle gaining 200 kg at grass is achievable with a 6.5 months grazing season and a LWG of 1 kg per day.

## Opportunities:

- improve cattle performance using forage only diets
- to maximise the healthy benefits of grass fed meat
- to enhance cattle genetics to maximise performance from forages
- to reduce an over reliance on cereals
- to increase farm output from the same land area

Cattle are purchased at approximately 1 year old and are grouped by size. On arrival the cattle are wormed, given a flukicide and treated for cobalt. A target liveweight of 3,000 kg per hectare is used in the spring, dropping to 2,000 – 2,500 kg per hectare later in the season. The target daily liveweight gain over the grazing season is 1.5 kg per day. A small flock of sheep are also kept on the farm, mainly as a management tool to improve the grass for the cattle.

The grass mixes grown on the farm are based on diploid varieties. These are selected on the grazing D value, their persistence, winter hardiness and their yield. The usual fertiliser applied to the paddocks is an application of 0:25:25 at the end of March, followed by 125 kg/ha (1 cwt/acre) of 34.5N at the beginning of April. A further two applications of 125 kg/ha of nitrogen will be made during the season. The aim is for the cattle grazing requirement to follow the pattern of grass growth. The cattle grazing requirement increases through May and June. With rapid cattle growth during this period, peak cattle slaughtering will take place in June and July. Cattle numbers are therefore reduced for the second half of the season as grass growth slows down. Some paddocks are also taken out of grazing and used for silage as the cattle's requirement for grazing area declines. The key to the entire system is tight grazing in the spring and early summer.

It is very important to measure grass height. The aim is to have the cattle enter a grazing paddock when the grass is 10-15 cms. The cattle move on to the next paddock when the grass is 5 cm. The farm is split into paddocks of such a size that the cattle area moved on a daily basis.

Mr Shannon has calculated his summer grazing variable costs at 22 pence per head per day. His target is for every animal on the farm to gross a financial return of over £1 per day.

Winter feeding is based on Kale or Swift, plus silage. The silage is baled and positioned along the edges of the field. The field is then sown to kale or swift. During the winter, the kale/swift is strip grazed. As the electric fence is moved, the silage bales along the edge of the field are unwrapped and made available to the cattle. The cattle are therefore outwintered on this simple system and have been achieving a liveweight gain of 0.5 kg per day. Mr Shannon has calculated his winter variable costs at 65 pence per head per day.

One of the major benefits of his forage system is that the cattle do not suffer a growth check at turnout unlike many cattle that are wintered indoors. When grass begins to grow in the spring, these out wintered cattle very quickly achieve very high daily liveweight gains.

## Infrastructure:

- Permanent electric fencing on top of dykes & fences
- Temporary electric fencing
- Good layout of fields
- Extra water troughs and pipes



# More grass... What does an extra 2 tonnes of dry matter per hectare mean?

- Higher stocking rates (additional 2.5 ewes (+ Lamb) per hectare)
- Reduced purchased feed. Every 1 tonne of dry matter from grass has the same energy content as 1 tonne of barley
- Growing more grass at home may reduce the need for rented grass

## Basic feed budget for a rotational system, example:



Size of paddock	1 ha
Pasture cover	2,500 kg DM/ha (10 cm)
Desired residual cover	1,500 kg DM/ha (5 cm)
Available DM	1,000 x 1 ha = 1,000 kg DM
Group size	40 bullocks at 400 kg
Group demand per day	40 x 400 x 3% = 480 kg DM per day = 2 days grazing

There are nine climate change focus farms in Scotland. Keep up to date with their activities at



[www.farmingforabetterclimate.org](http://www.farmingforabetterclimate.org)

Meetings are free to attend and all farmers are welcome.

For Nether Aden, contact farm facilitator Alan Bruce on 01888 563 333 or via email at [alan.bruce@sac.co.uk](mailto:alan.bruce@sac.co.uk) for more information.

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