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Beef Grass Management Final Report



Illustration 1: Group of cattle at land near Kidwelly

SUMMARY

The aim of the project was to show the huge potential of managing grassland well in a rotational grazing format with beef cattle and in doing so increasing grass yield + utilisation, as well as growing cattle to their optimum just off excellent quality grass. As a result of this project the benefits of better grass utilisation without the need for bought in feed makes the enterprise more self sufficient and sustainable into the future

The results show:

- 10.5TDM/Ha of grass grown over all grassland . Range of 14.7 – 6.7 TDM/Ha
- 1.0kg of growth per animal per day was achieved over <300 cattle over 225 days
- Consistently high quality grass grown over the season

Key Findings :

- Rotational grazing works well with beef cattle
- Achieving high growth rates in both grass growth and cattle growth rates
- Monitoring of grass and cattle growth rates is vital

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Introduction

The aim of the Beef Grass Management Project is to improve the amount and quality of grass grown on farm and its utilisation by beef cattle. By providing stock with top quality grass consistently throughout the grazing season, optimum growth rates can be maintained in all ages of grazing stock. Rotational grazing of different groups of cattle should enable farmers to build up grass in the autumn, extending the grazing season for stock and to carry grass over the winter to allow for early turnout in February. This project is being carried out at Cilrhue Farm, Boncath, North Pembrokeshire, which is owned and managed by Mrs BH Davies and her sons John and Edward Davies. They are keen to see how much costs can be saved in rearing stock to the point of finishing with this system and to find out what stock growth rates are achievable.

The farm extends to 214 acres of owned land, with an additional 93 acres being rented on annual lets. The farm is predominantly down to grass with about 20 acres of wholecrop grown in summer and seeded to rape for the out-wintering of cattle. This also forms part of the reseeding policy of the farm. Stock consists of about 600 head of cattle and calves of varying ages. The farming system consists of buying in 7-10 day old calves from local dairy farms, rearing on a grass/forage diet to about 24 months old and finishing on grass silage / wholecrop / concentrate diet to go straight to slaughter. The stock are bought in batches in the spring and autumn and consist of three main breed types of Friesian, Dairy Shorthorn and Hereford crosses. Historically, the stock have been grazed in small groups over the farm with about 150 of the 'big' cattle housed in a cubicle and slatted floor shed and finished on the silage / wholecrop / concentrate mix. Approximately 100 are out-wintered on rape and silage bales.

For the project, grass growth and quantity are measured every two weeks (weekly in the month of May) to find out how much grass is grown and which paddocks the stock should be going to. With this information, we can also plan which paddocks need to be dropped out for silage as they are too strong to graze, without running short of grass!

Along with the measurements of grass growth and quantity, grass samples are taken every month to monitor what is the quality of the grass being put in front of the grazing stock. To monitor stock growth rates, they are weighed once a month. To assist with this task the Davies' have invested in an electronic identification system (EID) which makes the collecting of this crucial information relatively easy. This device will download to a laptop/tablet where the growth rates are calculated.

1) KEY EVENTS

Following on from the Mid Project Report a few key events occurred which should be mentioned before the end of data collection.

Early August saw the fields which had grown wholecrop, ploughed and sown with rape in preparation for the out-wintering of cattle. One of these fields was sown with a short term Italian Rye Grass instead to provide initially late autumn/early spring grazing and depending on how the paddock responded would either be ploughed for wholecrop or left and another paddock would be chosen to be ploughed.

At the end of August weighing of cattle we had a disappointing growth rate of 0.80kg/day over all cattle. This was partly as a result of the group of cattle on the block of land near Kidwelly. Whereby one field was earmarked to be cut for round bale silage, but due to a decline in grass growths from a combination of cool wet weather and late application of fertilizer, it was decided to graze the field

with cattle. Although the cattle were fully fed on this feed, and it provided 8 days feed it was a more fibrous feed with lower energy and protein which in turn would have depressed the cattle growth rates.

One group of 35 cattle at the same time had missed a scheduled worming, with the consequence of having poor growth rates of 0.3kg to 0.4kg/day. As an example of the importance of worming and monitoring cattle at grass, after being wormed, the following weighing over a month later showed this group to have produced growths of between 0.75kg/day to 1.3kg/day.

At the beginning of September with the co-operation of H.C.C., John and Edward Davies, an open day was held at the farm. A successful day was had, which was well attended by local farmers, to see how the farming system had evolved over the years. It was explained how the project was being implemented on the farm, with some early data results. The day gave an insight into what the rotational grazing of beef cattle was achieving as far as both grass and cattle growth rates. And a look at how cattle were finished from home grown forages.

Mid September saw a drop in grass growth on the land at Kidwelly to 18kgDM/Ha, which was half the demand on 108 cattle. So with this information we decided to remove 30 of the cattle back to Cilrhue, where grass growth was better at 32kgDM/ha. At this point 30 cattle were housed to be put on a finisher diet. The Hereford close to finishing were kept on grass until ready. Also the block of land injected with liquid nitrogen was given a top dressing of 1 bag of ammonium nitrate, as the nitrogen from injecting had run out.

A farm walk produced an average farm cover (AFC) of 2540kgDM/Ha, which showed a surplus in the grass wedge going towards the start of the final grazing rotation. A grass growth figure of 31kgDM/ha/day balanced with the demand growth of 32kgDM/Ha/day, meant we would be able to sustain the AFC until the end of September before the final rotation was started. The Italian rye grass reseed was grazed for the first time at the end of September and would be grazed twice more before the end of the last rotation due to its vigorous growth.

By mid October another 33 cattle were brought back from the land at Kidwelly. This was done in order to reduce the growth demand from 28kgDM/Ha to 18kgDM/Ha, and this would allow the remaining 48 cattle to be grazed until late November whilst maintaining a grass wedge in preparation for an early spring turnout.

In a normal farm scenario to cope with the slowing down of grass growth rates more land would be used to graze and or supplementary feed would be introduced. This would have the effect of keeping the stock on a slow rotation of about 50/60 days whilst maintaining grass in the wedge ready for the spring.

The weighing of all the non housed cattle on the project, just before housing, was done in late October. This produced an average growth of 0.92kg/day daily liveweight gain, which included a range of growths of between 0.45kg to 1.87kg per day. Most of the cattle were housed by early November bar a group of spring born calves, who weren't on the project, but were housed by 12th of December after **recording average growths in the autumn of over 1kg/day, only fed on grass!**

As part of the planned out-wintering policy, 110 cattle started grazing the 10Ha of rape fields in early November. These were split up into 3 groups and given a daily allocation to supply 60% of their demand with the rest being met by round bale silage. This practice was done in order to stretch out the rape until late February whereby grass growth would be able to adequately cope with their

demand, along with earlier turned out stock.

A group of 35 of the same age cattle were also out wintered on stored grass and round bales, again to maintain their demand until late February.



Illustration 2: Rape crop with round bale silage placed out ready for out-wintering

2) GRASS GROWTH + AVERAGE FARM COVER

2014 has been an excellent grass growing year on most welsh farms, although farms on lighter soils or situated by the coast found it a testing time during June and July due to a warm dry spell and lower grass growths. As Cilrhue runs from a free draining loam down to heavier clay loam soils, on the whole it benefited from the dry summer, which led to good growth rates.

The aim with the grass growth and average farm covers was to build up a grass wedge as soon as possible, as due to winter tack sheep on the farm there was very little grass. The average farm cover was measured at 1538kgDM/Ha, whereas we needed to be close to 2100kgDM/Ha at the start of February to be able to graze stock in February. If the farm had an AFC of 2100kgDM/Ha then we would be able to graze stock in early February, conditions allowing, and eat into the AFC over March and early April to until the AFC was down to about 1800kgDM/Ha, at which point growth would be overtaking the demand and land would then be taken out of the grazing platform to be used to grow silage.

The aim then would be to hold an AFC of 2100kgDM/Ha throughout the summer until early August, whereby the aim would be to build up a bigger grass wedge by early October with an AFC of 2600-2700kgDm/Ha.

Then the plan would be graze the whole farm on a slower rotation lasting 50/60 days until the AFC would be down to about 2100kgDM/Ha, at which point grazing would need to be stopped in order to preserve the grass for early spring turnout.

Due to the farm having had tack sheep and the AFC being at 1538kgDM/Ha we had a small amount

of grass to start with.

Growths did not pick up significantly until early April due to the low covers. The grass plant takes a lot of energy to produce the first main leaf. Once that happens the grass plant can utilise both the ground nutrients and the sunshine to increase growth rate quickly.

The phrase often used ' You Need Grass To Grow Grass ' is especially applicable to growing grass in early spring and autumn.

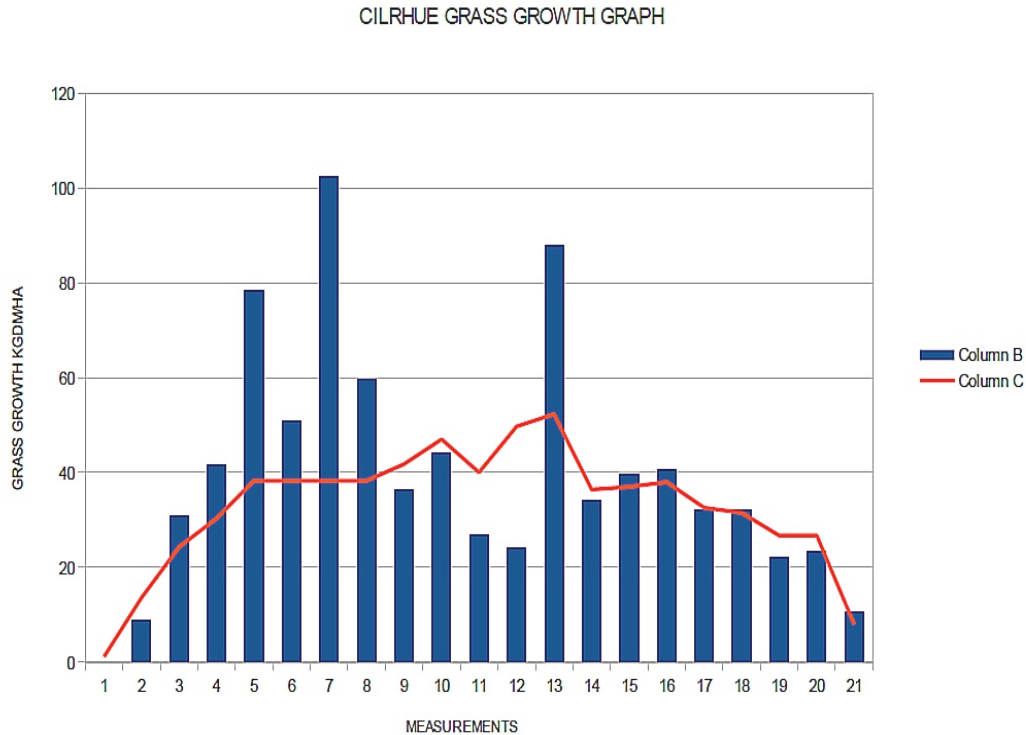


Illustration 3: Cilrhue Grass Growth Graph

COLOUMN B = GRASS GROWTH (kgDM/Ha)

COLOUMN C = STOCK DEMAND (kgDM/Ha)

TABLE 1 GRASS GROWTH DATA 2014

MEASUREMENT NUMBER (See Graph Illustration 3)	DATE	GRASS GROWTH (kgDM/Ha)	AVERAGE FARM COVER (kgDM/Ha)	GRAZING PLATFORM (Ha)	STOCKING RATE LWT/HA	DEMAND GROWTH (kgDM/Ha)
1	11/03/14	0	1538	91	60	1.2
2	26/03/14	9	1640	97	682	13.6
3	08/04/14	31	2022	73	1212	24
4	22/04/14	42	2224	70	1512	30
5	06/05/14	78	2307	61	1907	38
6	14/05/14	51	2239	61	1907	38
7	21/05/14	102	2374	61	1907	38

8	27/05/14	60	2517	61	1907	38
9	03/06/14	36	2375	62	2074	42
10	18/06/14	47	2374	67	2348	47
11	02/07/14	27	2412	68	2420	45
12	17/07/14	24	2650	68	2485	50
13	25/07/14	88	2504	68	2617	52
14	06/08/14	52	2154	105	1818	36
15	22/08/14	40	2430	105	1849	37
16	05/09/14	41	2480	105	1850	37
17	16/09/14	32	2540	105	1629	32
18	30/09/14	32	2551	105	1573	31
19	14/10/14	22	2541	105	1336	27
20	28/10/14	23	2527	105	1336	27
21	13/11/14	11	2253	105	500	8

As can be seen from the grass growth data in Table 1 the growth obtained at Cilrhue over the grazing season was from a moderate amount of fertilizer was significant. On the graph the grass growth is the blue bar chart and the stock demand is the red graph line. The grass growth generally looked like an average year with a peak in late May of 102kgDM/Ha per day and from then on a gradual decline.

That said the farm did suffer in the dry spell in mid summer which had the effect of halving growth rates in mid July. Then after some much needed rain grass growth rates exploded up to 88kgDM/ha in late July before settling down to more average seasonal growth rates. With the second peak of grass growth, it placed the farm in a strong position with a AFC of 2504kgDM/Ha. This figure was higher than planned but taking into consideration the stocking rate of 4LSU/Ha (2617Lwt/Ha) and predicted growths decreasing, we carried on with the challenge of maintaining feed quality and cattle growth rates.

To maintain grass quality some paddocks were pre-mown and grazed in 24 hr allocation behind temporary fences. This is an effective way of tidying up paddocks and maintaining good quality grass without wasting grass, as can happen with 'topping' paddocks. As more ground came back into the grazing rotation after 2nd cut silage, the average cover dropped to 2154kgDM/Ha, this was due to the aftermaths of the silage ground being low. As the grazing area increased, the demand on growth dropped from 52kgDM/Ha to 36kgDM/Ha, a drop in demand of about 30%. With the grass growth exceeding demand growth, the AFC was able to be increased towards the target of 2600kgDM/Ha by the beginning of October.

As a result of poorer than expected grass growths in September the AFC was lower than had been planned for at 2551kgDM/Ha for the start of the last grazing rotation. Fortunately the autumn was a good one and ensured decent growths during all of October, as well as helping with good grass utilisation in eating out paddocks ready for the spring, and maintaining good cattle growth rates of 0.92kg/day.

3) GRASS QUALITY

TABLE 2

MONTH	M.E. (Mj/Kg)	Crude Protein(%)	Dry Matter (%)	D Value (%)	Sugar (g/Kg)	Non Digestible Fibre (g/kg)
APRIL	9.8	31	18	62	6	379
MAY	10.8	20.4	18.9	69	112	430
JUNE	10.5	26.2	15.9	67	43	391
JULY	11.2	24.8	17.1	69	61	408
AUGUST	10.6	14	23.3	68	142	462
SEPTEMBER	10.2	14	17	65	127	461
OCTOBER	10.2	19.7	19.9	65	88	444
AVERAGE	10.4	21.4	18.5	66.4	83	425

As part of the project grass quality samples were taken throughout the normal grazing season to monitor the quality of pasture put in front of the stock. Looking at the data in Table 2 we can see that the average of all the results was a good quality but there were some areas for improvement. Initially the first sample result showed a very high protein level of 31% which correlates with a lower Non Digestible Fibre (NDF) of 379g/kg , which indicates more leaf and very little stem. Although as protein level is linked to the available nitrogen in the ground , it may be as a result of recent slurry application.

As the results over the season show that with slightly more fibrous pasture you get a bit of a drop in protein levels . As well as this the fact that the nitrogen levels may have been lower due to late application of fertilizer may have contributed to the lower protein levels. This shows that in practice that although some pasture management of pre-mowing was done on the farm , the paddocks sampled in August and September had not been done and warranted some positive management in future. Another explanation may be that the grazing pressure had not been sufficient to eat out the paddock on previous grazings and some may have been left. Generally the pasture quality was very good to be able to sustain an average daily live weight gain over all the project cattle of 1kg/day.



Illustration 4: Good example of back fencing on high covers

4) STOCKING RATE

The overall stocking rate of this farming enterprise stands at 2.6 Livestock Unit/Ha (1550kg liveweight/ha.) In practice due to cropping and reseeding about 31 acres or 12.7ha could not be grazed resulting in an effective stocking rate of 2.95 LSU/Ha (1770kg Lwt/Ha) .

The stocking rate fluctuated during the grazing season from 2 LSU/Ha (1200kgLwt/Ha) up to 4.3LSU/Ha (2600kgLwt/Ha). Within those figures one group was stocked at 4.6 LSU /Ha (2760kgLwt/Ha) for most of the summer.

The complete set of stocking rates can be seen on Table1.

5) Paddock PERFORMANCE

Whilst measuring the paddocks for this project we have created a set of data for every paddock/field, which through using the 'Agrinet' software has compiled a list of how much each paddock has grown over the year in tons dry matter per hectare. This list is an invaluable tool for the farmer to see which paddocks are his best and which are his poorer performing ones. With this information he can decide which way forward to rectify any problems. This in practice has happened at Cilrhue as the whole farm has been soil sampled , and from those results a plan of action has been drawn up , including focusing on the poorer growing paddocks.

The overall average yield of all measured paddocks was 10.53TDM/Ha, which included a high of 14.7TDM/Ha to a low of 6.7TDM/Ha

Looking at the data in Illustration 4 , we can see the best paddock performance was paddock number 5A , which grew 14.7 TDM/Ha and paddock 22 which grew 13.7 TDM/Ha . These best performing paddocks had different fertilizer regimes, where No 5A had the bagged fertilizer regime , No 22 received the liquid nitrogen injected regime.

Both these better performing paddocks are comparatively old leys with No 5A and No 22 both being 20 year old , with No 5A being earmarked for reseeding before the project had monitored the growths it was capable of. What was noticeable was that the better growing paddocks grew more grass in the spring and autumn ,compared to the paddocks growing less than 10 ton dry matter per hectare.This is true in the spring as the better growing paddocks had about 200kgDM/Ha more herbage on them in March than the paddocks with less grass on them.

The effect to early growth emphasis the need to build a sufficient wedge of grass up in the autumn, so then in the spring there is grass there to grow when conditions improve.The extra growth achieved by the better paddocks is shown to great effect in the average daily growth data. Where paddock No 5A had an average daily growth figure of 64kgDM/Ha , a lesser growing paddock such as No 4A had an average daily growth figure of 38 kgDM/Ha.

That is a significant **40%** more grass grown over the grazing season!

TABLE 3 Paddock Yield Tonne/Ha 2014

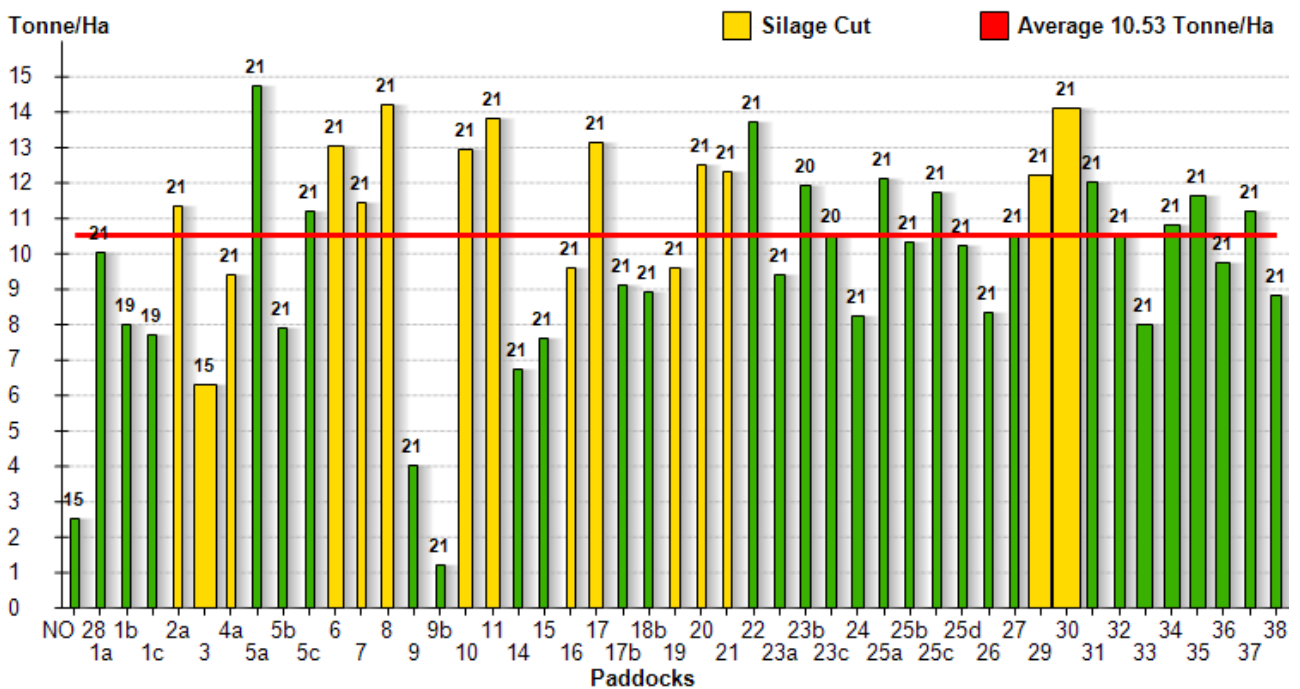
paddock	Area Ha	Total Tonne/Ha	Jan-Apr	May-Aug	Sep-Dec	Daily Average Growth
1a	1.530	10.0	1.6	4.9	3.5	40.4
1b	1.530	8.0	0.0	4.2	3.8	42.0
1c	1.530	7.7	0.0	7.1	0.6	37.7
2a	1.250	11.3	1.6	5.8	3.9	45.9
2b	1.300	10.4	1.7	5.5	3.2	46.4
2C	1.200	10.2	1.5	5.5	3.2	46.4
3	5.600	6.3	0.8	5.5	0.0	38.4
4a	0.940	9.4	1.5	5.6	2.3	38.3
4B	0.940	3.5	0.0	0.0	3.5	50.3
4C	0.930	2.0	0.0	0.0	2.0	29.0
5a	1.460	14.7	3.5	7.0	4.2	63.7
5b	1.460	7.9	1.7	4.9	1.4	34.1
5c	1.460	11.2	0.4	8.9	1.9	48.2
6	4.060	13.0	1.2	7.5	4.2	52.5
7	2.200	11.4	1.5	7.1	2.8	46.2
8	2.780	14.2	1.2	8.0	5.0	57.5

9	1.740	4.0	0.9	1.3	1.8	16.1
9b	1.630	1.2	0.6	0.6	0.0	6.3
10	3.510	12.9	1.9	7.8	3.2	55.7
11	3.340	13.8	1.9	8.1	3.8	55.8
12	2.010	0.0	0.0	0.0	0.0	0.0
13	3.200	0.0	0.0	0.0	0.0	0.0
14	0.810	6.7	1.2	3.8	1.7	27.2
14b	5.800	0.0	0.0	0.0	0.0	0.0
15	1.010	7.6	1.4	5.2	1.0	35.2
16	1.000	9.6	2.2	6.1	1.3	47.1
17	3.240	13.1	1.8	7.7	3.6	53.2
17b	0.400	9.1	0.7	4.7	3.6	36.6
18	3.150	2.8	0.0	0.0	2.8	48.3
18b	0.400	8.9	1.7	3.9	3.3	36.0
19	2.640	9.6	0.7	8.4	0.5	50.5
20	1.250	12.5	0.7	9.1	2.7	54.1
21	1.670	12.3	0.8	9.2	2.3	49.8
22	1.340	13.7	0.3	9.9	3.5	55.4
23a	2.320	9.4	2.3	3.8	3.2	38.2
23b	2.320	11.9	0.5	8.1	3.4	54.4
23c	2.320	10.5	0.5	7.2	2.8	48.1
24	3.160	8.2	1.7	2.6	3.9	35.5
25a	0.970	12.1	1.8	6.8	3.6	49.0
25b	0.970	10.3	1.0	6.0	3.2	47.5
25c	0.970	11.7	1.7	5.9	4.0	50.3
25d	0.970	10.2	1.2	6.8	2.2	43.8
26	1.231	8.3	0.8	5.4	2.1	33.8
27	1.600	10.5	0.5	7.4	2.7	42.7

29	5.540	12.2	0.3	9.9	2.0	56.2
30	7.000	14.1	2.0	10.4	1.7	65.2
31	2.430	12.0	1.6	7.6	2.8	48.8
32	2.340	10.5	0.8	7.7	2.0	42.6
33	3.700	8.0	1.3	4.9	1.9	34.8
34	3.900	10.8	1.3	7.4	2.1	46.7
35	3.800	11.6	2.1	8.0	1.5	47.0
36	3.400	9.7	2.0	5.1	2.6	39.3
37	2.400	11.2	1.9	7.3	2.0	45.3
38	2.380	8.8	1.3	5.7	1.8	35.5

On the data sheet there are some paddocks with low yields , these are paddocks (28,3) that have been partially grazed then reseeded .No 18 has had wholecrop grown on it then put back to italian ryegrass. Some of the paddocks have no measurements at all as they had grown wholecrop and then put back in to rape (12,13,14B) .

Illustration 5: Graph showing variation in yield in paddocks



Looking at Illustration 5 the numbers above the bars are the number of measurements made on each individual paddock over the grazing season.

6) FERTILIZER REGIME

The fertilizer regime used at Cilrhue started with an early application of 23 units /acre of nitrogen over all the grassland in mid March. Due to the stock not grazing until the end of March, the next application on the grazing ground was made in the middle of April of 40 units/acre of nitrogen .This product is a slow release fertilizer which is meant to last about 60 days before the need to apply more. The area earmarked for silage was given 3000gal/acre of cattle slurry at the of March , with a further 60 units/acre of nitrogen applied by mid April.

One block of 35 acres was injected with Liquid nitrogen at a rate of 200 units/acre as an on farm trial on 20th April. The liquid nitrogen was meant to last 5 months before needing top dressing. The overall result of this on farm trial was that although the injected land didn't out perform the bagged regime, it did do well in the dry spell in the middle of the summer. As it was used on drier land it kept grass growing even on the shallower soils with no sign of the land burning off as can happen with applying fertilizer in dry conditions on shallow soils.

After 1st cut silage was taken the silage ground again received 3000 gal/acre of cattle slurry, followed shortly by 40 units/acre of nitrogen in mid June. At the same time the grazing ground received another 40 units/acre of nitrogen.

The Block of land near Kidwelly after measuring was found to have significantly lower growths towards the end of May and it was decided to apply 34.5 units/acre of nitrogen to boost growths.

After 2nd cut all the silage area received 34.5 units of nitrogen in mid August , with the grazing ground receiving 40 units/acre of nitrogen at the same time.

The block of land which was injected with liquid nitrogen was given a top dressing of 34.5 units/acre of nitrogen in mid September, as growths had slowed down due to the nitrogen running out.

The final application of fertilizer was applied to the ground near Kidwelly in the middle of September at a rate of 1 bag/acre of 24-0-13, to keep the grass growth going with an eye to maintaining a grass wedge for the spring.

TABLE 4 FERTILIZER USEAGE

DATE	PRODUCT	RATE (units/acre)	RATE (kgN/Ha)	TOTAL(kgN/Ha)
Silage Ground				
15/03/14	Nitrogen	23	28	
30/03/14	Slurry	3000 gal/acre	22	
12/04/14	Compound	60	74	
10/06/14	Slurry	3000gal/acre	22	
15/06/14	Compound	40	49	
15/08/14	Nitrogen	34.5	42	237kgN/Ha
Grazing Ground				
15/03/14	Nitrogen	23	28	
15/04/14	Compound	40	49	
15/06/14	Compound	40	49	

15/08/14	Compound	40	49	
15/09/14	Nitrogen	34.5	42	217kgN/Ha
Injected Ground				
15/03/14	Nitrogen	23	28	
22/04/14	Liquid Nitrogen	200	245	
15/09/14	Nitrogen	34.5	42	315kgN/ha
Kidwelly Ground				
15/03/14	Nitrogen	23	28	
15/04/14	Compound	40	49	
30/05/14	Nitrogen	34.5	42	
01/07/14	Compound	40	49	
15/09/14	Compound	24	29	197kgN/Ha

As can be seen from the fertilizer Table 4 the farm has used a moderate amount of fertilizer, with around 240kgN/Ha over all grassland, considering the stocking rate is just under 3LSU/Ha. They have made best use of the slurry they produce by targeting applications on the ground earmarked for silage production, as they have the storage to be able to do this.

With the modest use of fertilizer producing an average yield of 10.5 TDM/Ha of grass grown, to compare to average use on farms, many use 25% more fertilizer to achieve this type of grass yield. Ongoing a similar fertilizer regime would be used for the forthcoming season. Although after the project had finished a whole farm soil sampling was done and found a few issues in soil fertility to be addressed, with the need for P+K and lime needed.

7) CATTLE GROWTH RATES

TABLE 5

AGE OF STOCK	BREED	GROWTH RATE RANGE (KG/DAY)	AVERAGE GROWTH RATE (KG/DAY)
12 MONTHS +	FRIESAN	0.64kg—1.34kg	0.97kg/day
18 MONTHS +	DAIRY SHORTHORN	0.64kg—1.39kg	0.98kg/day
12-24 MONTHS	HEREFORD CROSS	0.53kg---1.75kg	1.01kg/day
24 MONTHS +	FRIESAN +HEREFORD CROSS	0.86kg --1.34kg	1.16kg/day
		AVERAGE GROWTH	1.03kg/day

In all we had 293 cattle starting on the project, which comprised of :

- 60 Autumn 2012 born Dairy Shorthorn
- 165 Spring 2013 born Friesan
- 48 Spring 2013 born Hereford cross
- 20 Spring 2012 born Friesan +Hereford cross

It was a good growing season as a whole, apart from a long dry spell in June and July although when the rain came we had some really good growths.

To try to maintain good cattle growth rates the Davies family and staff worked hard to try to ensure

the stock received the best quality grass throughout the year.

In the figures in Table 5 they show the variation in cattle growth rates through the different breeds. The growths achieved were very respectable, although the issues we had with the group down near Kidwelly, and the small group with the missed worming probably did affect the average growth of the top two groups in the table. The Hereford crosses had a slightly better average growth overall although their range of growths varied a lot more than the other breeds on this project. The best performing group was the heavier cattle who from turnout to slaughter averaged 1.16kg/day, between 0.15kg-0.19kg/day more gained than the other groups.

What was clear from the data produced, was that cattle with lower growth rates should at a practical level be re-grouped as the season progresses, in order to bring up the lowest of the average daily liveweight gains. The ongoing challenge to any beef enterprise is to limit the variation in growth rates among different groups of cattle.

8) KILLING OUT DATA

TABLE 6

BREED	AGE , MONTHS	KILLING OUT WEIGHT (KGS)	CLASSIFICATION
HEREFORD	29	315	O+4
HEREFORD	28	303	O+4+
HEREFORD	28.5	332	O+4-
HEREFORD	28.5	314	O5-
HEREFORD	29	287	O+4
HEREFORD	27.5	317	O+3+
HEREFORD	28	303	O+4+
HEREFORD	28	287	O4
FRIESIAN	28	276	O4
FRIESIAN	30	315	-O4L
FRIESIAN	30	287	-O4L
FRIESIAN	30	290	-O4L
FRIESIAN	28.5	287	O+4
FRIESIAN	29	292	-O4L
FRIESIAN	29.5	295	- O4L
FRIESIAN	31	315	-O3
FRIESIAN	29	325	-O3
FRIESIAN	28	300	O+3
FRIESIAN	28	288	-O4L
FRIESIAN	30	325	-O3
FRIESIAN	29	280	O3

The data on Table 6 shows the results gathered from the kill data of the cattle finished off grass during the duration of the project.

As can be seen from the data the hereford cattle on average finished a month earlier than their friesian counterparts, along with having on average 9kgs heavier carcass weight.

This may not seem very significant, but once you factor in a premium of between 50p—75p per kilo on the killing out weight, and taking out the higher purchase price of the hereford. Assuming that all other costs would be identical and they are managed in exactly the same way, then the hereford would return around £ 75/Hd more than the friesian cattle.

That said the practicality of trying to source 200+ hereford bull calves in February/March of a good health status locally is quite a challenge. As well as this reason there are a few main factors which determine the choice of stock brought on to Cilrhue:

- cost
- quality
- health status

The above points are why for the last 5 years the calves are predominantly sourced from one farm , of good quality and have good herd health protocols in place , such as:

- plenty of colostrum in the first 3hrs of life (10% of liveweight)
- herd is vaccinated for Lepto, Bvd ,Salmonella, Rotovirus
- the bull calves are treated the same as valuable heifer calves

The challenge to Cilrhue is to be able to take the cattle to as high a weight as possible on grass and home grown forages before the need to introduce bought in supplements to help get finish on them at the time of year they plan for.

One result achieved post project was that after speaking to the farmer John Davies, he found that a shed which normally takes 100 cattle last year in 4 groups varied in their weight range from 1 group of 500kg+ to 3 other lighter groups. This year he commented on the same amount of cattle in that shed , all 4 groups were all 500kgs+.

Although not technically measurable it was obvious he could see a significant difference in the effect the project had taken on the stock .

9) FINISHING CATTLE AT CILRHUE

Just a brief outline to explain how the cattle are managed at Cilrhue up to the point of leaving the farm to go to slaughter.

As mentioned earlier the farm grows and makes wholecrop silage to be used alongside grass silage for the winter and finishing rations.

Once cattle are housed in the autumn they are grouped after being weighed into similar sized groups by weight .From then on depending on their planned time of sale they receive differing rations.

The heavier cattle weighing around the 530kgs+ would be put onto a finishing diet comprising of :

- 50% wholecrop silage
- 50% grass silage
- 4-5 kgs straight cereal
- 60g / Hd/day mineral

This ration would be expected to achieve a liveweight gain of between 1kg-1.2kg/day.

The next lot of cattle would classed as heavy stores and would be in a weight range of between 450kgs to 530kgs.Thes cattle would receive a ration of :

- 70% grass silage
- 30% wholecrop silage
- 2kgs of cereal + protein balancer

This ration would be expected to grow the cattle at 0.9kgs-1kgs/day, but it would all depend on when they need to be sold off the farm, and when they would need to be put on a finisher diet.

The next class of cattle would be the lighter stores ranging from 350kgs-450kgs. As these animals need only be stored over the winter but maintaining a growth of 0.75kgs/day, their ration is a basic one of 70% grass silage and 30% wholecrop silage with mineral at the above rate.

The grass silage quality for 2014 first cut was as follows:

DM 22.4% CP 11% D-VALUE 66.7% ME 10.7% PH 3.7% NDF 49.2%

This silage was a very good analysis, although slightly low in dry matter where an ideal dry matter would be up in the high 20's %. But as the wholecrop is mixed with the grass silage, it would on average be about 35% dry matter, would equate to an average ration dry matter of 27% at a 70:30 ratio.

10) CONCLUSION

From the project data we can see that as a result of successful grassland management :

- It enables the growing of excellent quality pasture consistently throughout the grazing season, as can be seen from the average analysis :
 - ME - 10.4% , Protein - 21%, Dry Matter – 18.5%, D-Value – 66%,
- Ensures enough feed is grown to feed stock and to grow enough winter forage at a moderate to high stocking rate, on this project the following figures were achieved:
 - 10.5 TonneDryMatter/Hectare grown
 - Range From Best at 14.7TDM/Ha to 6.7TDM/Ha
 - 20% Bigger Area Cut For 1st Cut Than Normal With Same Stocking Rate
- Through rotational grazing which aids best utilisation of grass grown, whereby stock is frequently moved onto excellent grass, which in turn allows good re-growths.
- The three key figures whilst grass monitoring are:
 - Average Farm Cover (kgDM/Ha)
 - Daily Grass Growth (kgDM/Ha)
 - Demand Growth (kgDM/Ha)
- Monitoring of grass growth can give an early indication of grass surplus/deficit by as much as 2 weeks before it happens.
- Monitoring was done every 2 weeks and took 2.5Hrs to walk the 105Ha, with another half an hour to input data into the 'Agrinet' software.
- Monitoring of stock weights to find out daily liveweight gains regularly,(4-6weeks)
- Actual weighing was coincided with other main stock tasks, but on its own with the E.I.D system we were taking 30-50 seconds per animal to weigh on average.
- Wormed to manufactures recommended guidelines. This is an important point which was highlighted in the season by late worming and drastically low cattle growth rates. The farms protocol on the drug used was a worming to happen every 8 weeks.
- Over 293 cattle who started the project, an average daily growth of 1.03kg/day was achieved

over a grazing time of 225 days on grass.

- Finished cattle achieving 1.16kg/day before being finished on grass , with an average birth to slaughter length of 875 days.
- Take action on the bottom 10% daily liveweight gains, and separate to a prioritised group.

As well as these points some practical grazing tips came out of the project, which included

- To maximise grass growth , if the group of stock will take more than 36-48 hrs in one paddock use a back fence to protect the regrowth
- Adjust group size to balance grass demand to grass growth on a fixed block or alternatively put extra feed in if short.
- In very wet conditions move stock to drier paddocks and go back later, or graze for 3hrs and stand off on hard standing with some suitable forage until the evening/next day.

In Table 7 below you can see a suggested guide of targets needed to be aimed for in order to successfully implement a controlled grassland management regime with beef cattle

TABLE 7 TARGETS FOR ROTATIONAL GRAZING

GRAZING PERIOD	AVERAGE FARM COVER (kgDM/Ha)	ROTATION * LENGTH (days)	FERTILIZER APPLICATIONS (kgN/Ha)	STOCKING RATES	
				LSU/Ha	(kgLwt/Ha)
February	2100	40-60	30	2	1200
March	1950	30	0	2.5	1500
Early April	1800	21-24	45	3	1800
Late April	2100	21	0	3.5	2100
May	2100/2200	18/22	45	3.5	2100
June	2100/2200	21	35	4	2400
July	2100/2200	21	35	4	2400
August	2200/2400	25	30	3.5	2100
September	2400/2600	30	30	3	1800
Early October	2700	40-60	0**	2.5	1500
Early November	2400	40-60	0	2	1200

* Rotation length applies to each group/mob of cattle on the grazing platform.

** Option to follow stock with 25kgN/ha until mid-late October

After all the data has been collected and processed we have found some very positive results from this project and some important points to come from it are :

1. Monitoring grass growth and stock performance regularly gives you the information to make informed management decisions

2. It is vital that stock are presented with the best quality grass to obtain the best growth rates
3. Through controlled grassland management you can save costs.

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