

## **European Innovation Partnership Wales**

### **Alternative forage systems for marginal land**

#### **Interim Report Year 1, March 2019**

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## Background

This EIP Wales project seeks to compare performance from different grass mixtures on marginal land within the South Wales Valleys. The project will compare different seed mixtures on three separate farms over a three year period. The hypothesis is that alternative seed mixtures may be more suited to the high rainfall conditions, poor soil quality and low input systems than standard ryegrass/clover mixtures. The work will also develop an awareness of the value of measuring and recording different aspects of production.

On each of the three farms around 4-5 ha was identified for reseeding. Half the area was sown with a multi species ley containing 4 grass species, 2 legumes and 2 herb species with a conventional ryegrass/white clover ley sown on the remaining area. The farmers were keen to compare outputs from the two systems over the course of a 3 year EIP Wales project.

Conventional long-term Grass/white clover mix for upland beef/sheep

		Kg/acre
AberChoice	Late dip	3
AberWolf	Int Dip	2
AberGain	Late Tet	3
AberZeus	Int Dip	3
AberBite	Late Tet	2
Presto	Timothy	1
Aber Pasture	Medium white clover	1

Herbal ley (Kg/acre)

Qty per Acre / Pack	Variety	Variety Type
1	AberPaddock	Meadow Fescue
1	Presto	Timothy
2	AberZeus	PRG Intermediate Dip
4	AberLee	PRG Late Dip
2	AberGain	PRG Late Tet
1	AberPasture	White Clover Blend
0.5	AberChianti	Red Clover
0.5	AberClaret	Red Clover
2	AberNiche	Festulolium
0.6	Tonic	Plantain
0.4	Puna II	Perennial Chicory

In year 1 an assessment would be made on how well the seeds established and how they outcompete the undesirable weed grasses and broadleaved weeds. In year 2 and 3 the project will monitor forage production and quality, stock performance and invertebrate populations in the new leys. Grass cages have been randomly sited in each ley to allow a detailed assessment of growth at each site.

## Summary of Project - Year 1

2018 proved to be a challenging year for agriculture in Wales, dominated by the summer drought. All three farms however managed to successfully reseed their field parcels, albeit at different periods of the year.

The first farm to reseed was **Gellifeddgaer** with the field established (following roots) in the beginning of June, just before the dry spell. The farm was lucky in that sufficient rain fell to allow the leys to establish through June and into July. It was noted that the chicory and plantain (and self-seeded yarrow) in particular thrived during the dry spell.

In early August 193 lambs (Improved Welsh X Texel) were introduced to the whole of the 4.8 ha (12 acre) field. A week later a further 87 lambs were introduced to keep on top of the growth. Lambs initially preferred the conventional ley to the chicory but soon adapted. Lambs were taken off the new leys on 20<sup>th</sup> August with 125 drawn for slaughter at 40kg.

In early September 170 sheep were re-introduced to the field for a week with 200 ewes & lambs introduced in the 3<sup>rd</sup> week of September. Additional grazing carried on until November.

Gellifeddgaer 21<sup>st</sup> Jan 2019



Forage production through September was assessed and the herbal leys plots grew at 67kgDM/ha – fractionally lower than the control. The dry matter content of the herbal ley was lower than that of the control; only 10% compared to 14%. The dry matter of the chicory and plantain leaf was as low as 8% - with the grasses typically between 14 and 16%.

Separations of forage material in late September revealed a high component of white clover in the conventional ley (50% white clover, 42% ryegrass and 8% weeds – expressed on a dry matter basis).

In the herbal ley the grass and clover components were lower (28% grass, 6% white clover, 3% red clover) with the sward being dominated by the chicory (37%) and plantain (22%).

Ground cover assessments in late November revealed a stronger grass component in the conventional ley in late season as the clover growth slowed. There was variability between the three reps - Rep 1 being north facing, Rep 2 on the ridge and Rep 3 south facing.

Gellifedgaer				
<b>Control</b>				
	Rep1	Rep2	Rep 3	Mean
Ryegrass	75	70	60	68
Timothy	4	2	3	3
White clover	8	12	25	15
weed grasses	5	10	2	6
broad leaved weed	0	1	0	0
bare ground	8	5	10	8
dead material				
<b>Herbal</b>				
	Rep1	Rep2	Rep 3	Mean
Ryegrass	35	25	35	32
Timothy	4	5	2	4
Fescue	1	0	0	0
Plantain	20	35	35	30
Chicory	10	10	20	13
White clover	8	10	3	7
Red clover	2	0	0	1
weed grasses	5	5	5	5
broad leaved weed	0	0	0	0
bare ground	15	10	0	8
dead material				

The herbal ley was still dominated by the two broad leaved herbs, and had twice the amount of bare ground in the sward base.





Weed levels in both types of ley were relatively low – with main weeds being chickweed and meadow grasses – although there are a couple of areas of the south facing bank where creeping thistle is present, which may need controlling next year.

**Summary:** The reseed as a whole proved very successful allowing the 125 lambs to be drawn in August and good levels of grazing into the autumn. The chicory and plantain was almost too successful in the herbal ley and the lambs did not initially take to it. While chicory dominated the herbal ley, it was noted that dry matter content was low at only 8% for cuts taken on 5<sup>th</sup> October. It was also thought that the herbs may have checked the grass development in the herbal ley as grass growth appeared better in the conventional ley. Clover levels were noted as good in both leys. Chickweed was noted in varying degrees throughout the leys which were both gappy in places.



Next Steps: Fencing to allow comparison of established leys in 2019 growing season and onwards. Fertiliser policy, grazing policy, cattle grazing.

The 5.2 ha (13 acre) field at **Gilfach Isaf** was established towards the end of July as the drought ended. The field had not been ploughed for some time and ground was still very dry at cultivation, but establishment was deemed acceptable.

Gilfach Isaf 21<sup>st</sup> Jan 2019



The two leys were gappy with docks and chickweed noted, and it was mob grazed in mid-September with approximately 250 sheep for 4-5 days. On 18<sup>th</sup> October 78 two year old Lleyn X Texel ewes were introduced with the ram to the field for 3-4 weeks. At scanning it was noted that ewes on the new ley scanned at 162%, compared with 141% for a similar batch of ewes tacked onto good ground nearby. Towards the end

of November 100 ewe lambs were introduced to the field to take it down to 4cm prior to resting until the spring.

<b>Gilfach</b>				
<b>Control</b>				
	Rep1	Rep2	Rep 3	Mean
Ryegrass	65	55	35	51.7
Timothy	2	3	2	2.3
White clover	20	10	22	17.3
weed grasses	7	15	3	8.3
broad leaved weed	6	15	3	8.0
bare ground	0	2	35	12.3
dead material	0	0	0	0
<b>Herbal</b>				
	Rep1	Rep2	Rep 3	Mean
Ryegrass	40	45	55	46.7
Timothy	5	3	3	3.7
Fescue	0	2	0	0.7
Plantain	7	18	15	13.3
Chicory	5	10	5	6.7
White clover	2	2	5	3.0
Red clover	1	0	2	1.0
weed grasses	5	8	10	7.7
broad leaved weed	10	10	5	8.3
bare ground	25	2	0	9.0
dead material	0	0	0	0

Ground cover assessments in November indicate a higher weed level in the conventional ley at Gilfach than Gellifeddgaer – and a slightly more open sward (probably driven by drier conditions post establishment).

The herbal ley at Gilfach is less dominated by the chicory and plantain – but again contains more weeds

**Summary:** The 2 leys have established well although they remain gappy with chickweed and docks in places. The difference in scanning % was very interesting although not specific to any one ley, rather illustrating the benefits of reseeding in general.

Next Steps: Fencing to allow comparison of established leys in 2019 growing season and onwards. Discussion on fertiliser policy, grazing/cutting policy to maximise quality, sward height targets for fattening lambs, and possible dock control strategies.

Two adjoining fields at **Brynchwith** were the last to be established towards the end of the season in early September. The top field was sown with the conventional ley while the lower field was sown with the herbal ley. There was particular interest in the impact of Timothy on the lower field which lies wet in the winter. Establishment was deemed acceptable in both fields, although they were gappy in places with varying levels of chickweed.



## Conventional ley Brynchwith 21<sup>st</sup> January 2019



The lower field was noticeably wetter and grass/herb vigour noted as lower in wetter pockets where chickweed levels were high.



Each field was grazed with 65 ewes for a week in late October and Late November. The fields will now be rested until the spring when they will be grazed with ewes and lambs.

The ground cover assessments in late November show that the conventional ley is quite open and gappy, although relatively clean. Hopefully with well managed grazing the sward density should improve.



The multispecies ley is highly variable – due to soil texture/soil moisture variation in the field. In the wetter areas there is an abundance of chickweed and a poor establishment of the plantain and chicory (rep3). In the drier areas (rep 1 and 2) establishment is far better.

Future monitoring of sward status could be split into two areas (wetter/drier) – rather than allowing one rep to strongly influence the ‘average’ performance of the field – and would provide useful information on how the different swards are influenced by wetter, peatier soil conditions.

<b>Brynchwith</b>				
<b>Control</b>				
	<b>Rep1</b>	<b>Rep2</b>	<b>Rep 3</b>	<b>Mean</b>
Ryegrass	60	65	45	56.7
Timothy	2	3	0	1.7
White clover	5	2	5	4.0
weed grasses	3	10	5	6.0
broad leaved weed	5	0	0	1.7
bare ground	25	20	45	30.0
dead material	0	0	0	0
<b>Herbal</b>				
	<b>Rep1</b>	<b>Rep2</b>	<b>Rep 3</b>	<b>Mean</b>
Ryegrass	50	40	25	38.3
Timothy	5	3	5	4.3
Fescue	2	2	3	2.3
Plantain	5	18	5	9.3
Chicory	10	9	2	7.0
White clover	3	5	2	3.3
Red clover	0	0	0	0.0
weed grasses	10	3	7	6.7
broad leaved weed	5	15	50	23.3
bare ground	5	5	0	3.3
dead material	5	0	1	2

1) Control



2) Multispecies (dry)



3) Multi-species wet/peaty





**Summary:** The 2 leys have established well enough although they remain gappy in places with varying levels of chickweed. Wetter conditions in the lower field are reflected in less vigour/poorer cover which will need to be monitored. Given the later establishment date, it was felt that it is too early to draw any conclusions for the project.

Next Steps: Monitor growth levels in the lower field into spring, discussion on fertiliser policy, grazing/cutting policy, mixed grazing, measures to deal with weed issues in the multispecies swards (chickweed and rushes).

### **Other observations**

At both Gellifeddgaer and Gilfach there was a noticeable difference in the grazing heights of the two leys – with the control ley being grazed much tighter than the multispecies. It was felt that whilst the sheep had grazed the control ley down to target there was slightly too much cover on the multispecies ley when they came off. In an effort to record this difference the leys were plate metered and typically the multispecies ley recorded higher plate readings (by between 200 and 400kgDM/ha) – although to date there has been no modification of the calibration of the plate meter to reflect the difference in dry matter content – or the potential of the chicory/plantain leaf to influence the plate height.

Future grazing may have to be conducted with electric fences to try and maintain consistent covers between the two treatments.

A programme of concurrent herbage sampling and plate metering will be required to generate a more reliable calibration equation to allow more accurate plate metering of the multispecies swards.

### **Project Summary (End of Year 1)**

All three farms have established the two leys on their farms, albeit at different times of the year. Each farm is different in terms of topography and in places soil type but are all situated within the Less Favoured Area in an area of high rainfall. Farmers have worked well with the contractor (Chris Duller) who has provided ongoing mentoring to the group in terms of general grassland management and advice specific to the individual farms. Establishment conditions were challenging but leys have been grazed and are now rested prior to season two where monitoring of grassland production, livestock performance and pollinator/invertebrate populations will be implemented.