THEME REPORT

ANGUS MONITOR FARM
Productive EFA – Undersown Spring Barley Trial

THE CHALLENGE

- With the need to meet Ecological Focus Area (EFA) rules to receive the Greening element of BPS, the group wished to look at catch crops as an alternative to fallow
- Fallow was seen as a waste of land and with an increasing ewe flock on the farm there was a need for extra clean grazing for livestock later in the year
- Catch crops of undersown spring barley had been used in the past to meet the EFA requirements but there was a difficulty of getting a good grass establishment without having a detrimental effect on the spring barley yield
- This trial was set up to look at different type of grass and sowing rates to determine the optimum conditions to get a good spring barley crop and have the benefit of clean grazing in the autumn.
- In doing this, it was felt that the EFA rules could be used to bring extra production to the farm

WHAT WE DID ON FARM

- Field Details
  - Previous crop was potatoes
  - Lime
    - See Figure 1
    - Field was tested by GPS and lime applied to target of 6.2
    - 36t of calcium lime applied at an average rate of 3.3t/ha
  - Nutrient Status
    - Phosphate Status = Medium –
    - Potash Status = Medium –
    - Magnesium Status = Medium +
  - Concerto spring barley sown on 08/04/2017 at 215kg/ha

- Establishment
  - The field was ploughed in the spring, then the barley was sown using the farm's one pass drill.
  - All the grasses were sown using a grass harrow and applicator within days of the spring barley being sown.

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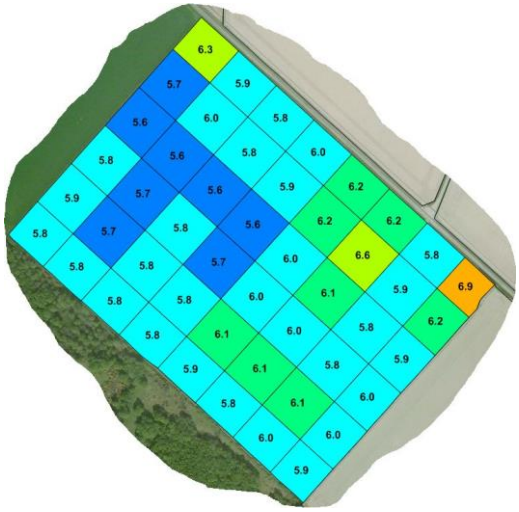
Figure 1 pH as at March 2017



- Spray Programme
  - T1 – 27/05/2017
    - Headland Charge @ 1.5L/ha £9.25/ha
    - Butryflow @ 0.5L/ha £11.30/ha
    - Helix @ 0.4L/ha £15.88/ha
  - T2 – 19/06/17
    - Master Magnesium @ 2.0kg/ha £5.00/ha
    - Credo @ 1.0L/ha £21.88/ha
    - Ruberic @ 0.50L/ha £7.25/ha

- Fertiliser Programme

Date	Product	Rate (kg/ha)	N Applied (kg/ha)	P Applied (kg/ha)	K Applied(kg/ha)
08/04/2017	16.16.16+7.5S	370	59	59	59
12/05/2017	Urea 46N	150	69	0	0
Total			**128**	**59**	**59**

Trial Layout

Zone 8	Zone 7	Zone 6	Zone 5	Zone 4	Zone 3	Zone 2	Zone 1
Control	**Comer** Timothy 5.6kg/ha	**Donata** Cocksfoot 5.6kg/ha	**Eurostar** Perennial Ryegrass (Tetraploid) 5.6kg/ha	**AberWolf** Perennial Ryegrass (Intermediate Diploid) 4kg/ha	**Meribel** Italian Ryegrass 5.6kg/ha	**Meribel** Italian Ryegrass 8.4kg/ha	**Meribel** Italian Ryegrass 11.2kg/ha

ROADSIDE (DROWNDUBBS ROAD END)

To Burnside

To Holemill

Figure 2 Trial Layout

Varieties

Comer	Timothy (Limagrain UK)	• Good yields under both cutting and grazing management. • Good early spring growth under grazing and good ground cover. • On SRUC Grass Recommended List • Cost £3.80kg = £21.28/ha
Donata	Cocksfoot **(**DLF)	• Highly digestible • Non-aggressive cocksfoot • Late type • Fits into mixes with perennial ryegrass, hybrid ryegrass, white clover and even Lucerne. • Not on SRUC Grass Recommended List • Cost £4.40kg = £24.64/ha
Eurostar	Perennial Ryegrass (Intermediate Tetraploid) (DLF/Limagrain)	• Particularly well suited to cutting with two good cuts of excellent D-value • Good seasonal distribution of growth • On SRUC Grass Recommended List • Cost £3.80kg = £21.28/ha
AberWolf	Perennial Ryegrass (Intermediate Diploid) (Germinal)	• Good yields under cutting • Very good yields under grazing throughout the season coupled with good grazing quality • On SRUC Grass Recommended List • Cost £4.20kg = £16.80/ha

Meribel	Italian Ryegrass (Limagrain)	• High yielding in first and second harvest years, with very good late summer and autumn growth
		• Good D-values
		• Very good ground cover, but may be prone to winter damage.
		• On SRUC Grass Recommended List
		• Cost £2.85kg
		  ○ 5.6kg/ha = £15.96/ha
		  ○ 8.4kg/ha = £23.94/ha
		  ○ 11.2kg/ha = £31.92/ha

RESULTS

There are obvious edge effects from the yield data as can be seen in the figure 3. However, if a 24m area around the field is removed, then the edge effect of the headlands are removed. Figure 4 shows the field split into the 8 different treatment zones with the 24m headland removed.

Figure 3 Field Yield data

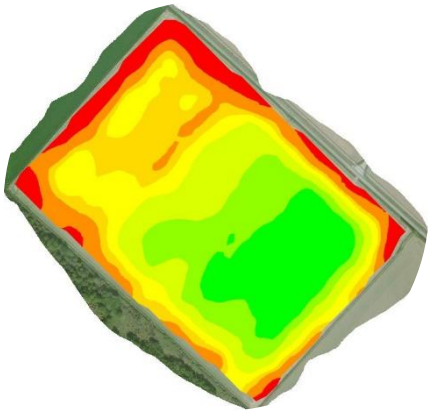


Figure 4 Field Treatment Zones

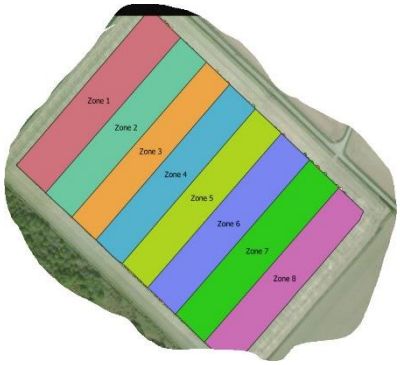


Figure 5 below summarises the data from the yield map in Figure 3

Zone	Minimum Yield (t/ha)	Maximum Yield (t/ha)	Range (t/ha)	Average (t/ha)	Yield Difference from Control (t/ha)
1	6.39	9.90	3.51	7.94	-0.86
2	6.35	9.73	3.37	7.86	-0.94
3	6.46	9.90	3.44	8.05	-0.75
4	6.54	9.88	3.34	8.47	-0.33
5	6.60	9.87	3.27	8.59	-0.21
6	6.37	9.87	3.50	8.80	0
7	6.55	9.84	3.29	8.85	+0.05
8	6.45	9.85	3.40	8.80	0

Figure 5 Summary of Yield Data

Costing

Zone	Yield Difference from Control (t/ha)	Estimated Yield Reduction of straw (t/ha)	Financial Reduction from Treatment* (£/ha)	Cost of Treatment ** (£/ha)	Total Cost (£/ha)	No of sheep grazing for 1 week @ £0.45/hd/wk to equate to total cost
1	-0.86	-0.43	163	57.42	220.42	489
2	-0.94	-0.47	179	49.44	228.44	507
3	-0.75	-0.38	143	41.46	184.46	388
4	-0.33	-0.16	59	42.30	101.30	225
5	-0.21	-0.11	41	46.78	87.78	195
6	0	0	0	50.14	50.14	111
7	+0.05	+0.02	10	46.78	56.78	126
8	0	0	0	0	0	0

Figure 6 Costings

*Spring barley calculated at £150/t for grain and £80/t straw

** Seed cost plus sowing at £25.50/ha

Aftermath grazing/use

When the field was cut, there was significant growth in the treatment zones sown with Meribel, with less visible growth as you moved over the zones towards the control. Once cut, the Meribel grew quickly and was soon able to graze ewes when compared to the other zones. The Meribel zones were grazed again in the spring where there was significant early growth and then ploughed for sowing swedes in April. Total grazing days are shown in figure 7.

No	Type	Duration (weeks)	Total No of Sheep Grazing
200	Lambs	3	600
120	Ewes	4 (some silage fed)	480
45	Ewes + twins	4	180
Total			1,260

Figure 7 Total grazing achieved

If grazing keep had to be sought for these sheep the rental equivalent would be £567.

WHAT HAS CHANGED ON FARM

As a result of this trial, the majority of the farms EFA requirement is met by the sowing of Italian ryegrass into spring barley. Sowing rates are kept quite low and delaying the sowing

of the grass has been tried to help reduce the effect on the spring barley crop. Changes have also been made to the establishment techniques of the grass. The trial was sown using a grassharrow and seeder, but good establishment has been achieved with broadcasting the grass seed using a quad bike and slug pellet applicator. Some of the community group have also taken up this option to meet their EFA requirements.

The benefits of this approach for the farm are:

- Reducing sheep wintering costs
- Improving soil health by having a root growing in the soil for the majority of the year
- Better use of the land asset of the farm
- Recycling of the nutrients on the farm through grazing
- Provides clean/fresh grazing for sheep.
- Reduce costs in managing stock away at grass.

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The Scottish Government
The European Agricultural Fund for Rural Development: Europe investing in rural areas
SRDP Scottish Rural Development Programme