

Owl Farm Pasture Renewal Plan

Feasibility of cropping, weed sprays, over-sowing, under-sowing and key actions going forward

Following the Pasture Condition Scoring of Owl Farm, a number of suggestions have been put forward in terms of a plan for either renovating or remedying some of the lower scoring paddocks. This report hopes to provide some information around the following:

1. **Chicory establishment spring 2015**
2. **Weed spray score 2 & 3 paddocks with Baton & Valdo spring 2015**
3. **Under-sowing of score 2 & 3 paddocks with short rotation ryegrass in autumn 2016**
4. **Over-sowing of clover in autumn (if at all, this season)**
5. **Identifying the spring sown chicory area for spring 2016 (so can be sown to annual ryegrass in Autumn 2016)**
6. **Book in for pasture scoring all paddocks again in the autumn 2016**

NOTE that all paddock numbers referenced in this report are based on and using the NEW validated farm map – that corresponds to the electronic version of the map currently being developed by Opus.

1. CHICORY ESTABLISHMENT

A chicory recommendation has been compiled in order to highlight the necessary practices that are involved in establishing a successful chicory crop for spring. Please refer to the Spray recommendation prepared by Nufarm in the Appendix of this report, and a Best Practice Plan for Chicory.

A cost analysis for this recommendation has also been provided, along with a sensitivity analysis in regards to crop yield and c/kgDM. The costings in this analysis were made assuming products purchased were at RRP, and some costings, including drilling, agchem application and fertiliser spreading were assumed and therefore are likely to differ. Costings do not include opportunity cost of pasture growth foregone, nor regrassing costs.

Additional Notes: Chicory

- Chicory paddocks identified so far: 5, 6, 11, 15, 52, 56 and 45 (paddock 45 has also been identified as the paddock for the September Focus Farm Day & student chicory DM work).
- Discussions were made around the paddock 58 (62 on old map = 1.16 ha) which was chicory last year – poor regrassing and now is very open. One option would be to put this paddock through chicory once again, however on the basis that the probable failure of this paddock as a chicory paddock during the summer 2014/2015 was due to a very free draining soil type, it may be better simply to weed spray this paddock and undersow with short rotation ryegrass in the autumn.
- Discussions were held around the potential to apply irrigation to at least one chicory paddock (either by investing in more hose at \$1000 per 100m to reach one of the above paddocks OR to reconsider changing one of the chicory paddocks to e.g. 21 or 22, score 3 paddocks which could be suited for chicory, but are on much lighter soils than the other paddocks nominated above). **A decision on this is needed ASAP.**
- Cam Holmes has offered to spray out the chicory area in spring 2015.

Sensitivity Analysis c/kgDM for Chicory Crop, using per ha Cost Analysis (next page)

	c/kgDM	
Crop Yield (TDM/ha)	9	14.2
	10	12.7
	11	11.6
	12	10.6
	13	9.8
	14	9.1
	15	8.5

Best Practice Chicory - Cost Analysis				
	Product	Rate	Per Hectare	Cost/ha
SPRAYOUT				
	Weedmaster TS540	4	L/ha	\$56
	Pulse Penetrant	100	ml/100Lwater	\$2
	Dew 600	400	ml/ha	\$8
	AgChem Application			\$38
FERTILISER				
	Lime including spreading	1	T/ha	\$130
	DAP	250	kg/ha	\$232
	Fertiliser spreading application			\$70
PLANTING				
	S/S Chicory Seed	8	kg/ha	\$184
	SlugOut Slug Bait	10	kg/ha	\$86
	Direct Drill			\$190
POST-EMERGE				
	<i>Sheriff 100 (if cutworm present)</i>	0.5	L/ha	\$24
	<i>AgChem Application (if cutworm present)</i>			\$38
	Bonza Spraying Oil	500	ml/100L	\$6
	Valdo	65	g/ha	\$31
	Sequence	0.5	L/ha	\$46
	AgChem Application			\$38
FERTILISER				
	Sustain N	150	kg/ha	\$94
TOTAL COST				\$1,273

NOTE:

Application costs of **\$38 per ha** could be saved if Cam Holmes did this work for us = total cost **\$17,537** – variance from cashflow budget (30-7-2015) of only **\$9,600**.

An area of 14ha has been recommended in order for the cows to be fed 2.5kgDM/head/day, assuming a 21 day rotation and an average growth rate of 85kgDM/ha/day over the whole season.

Current paddocks 5, 6, 11, 15, 52, 56 and 45 add up to 14.2 ha. At this point in time we're assuming paddock 58 is not included for chicory this spring.

Paddock Selection:

- Ideally we've tried to target paddocks closer to the shed to minimise walking distance / heat stress.
- Lighter soils will be avoided for chicory due to the performance of these paddocks last year – unless a lighter paddock such as 21 or 22 was to be used as part of an effluent application option – to be confirmed.
- Soil testing ASAP – **Emma will organise with Mark from Ballance in Cambridge**

In autumn next year, we should aim to carry out the Pasture Condition Scoring earlier. This will allow us to select our paddocks targeted for any spring 2016 cropping (probably but not necessarily chicory once again) and lead in with an annual ryegrass such as WinterStar II, which will be highly advantageous in terms of weed control with the Programed Approach as discussed at the 27 August 2015 meeting.

Figure. Recommended Programed Approach from now on (Autumn 2016) to use a short rotation ryegrass as part of the planned approach to chicory use from now on. The aim is to improve weed control in paddocks by undertaking three sprays with herbicide to maximise chance of reduced weed burden in final permanent pasture established after the chicory crop.



TIMELINES OF CHICORY ESTABLISHMENT – SPRING 2015

- Ideal target for establishment of chicory is when soil temperatures are 12°C and rising. Soil testing should be carried out ASAP (Emma is arranging this), then spray out could be targeted for mid-September, weather conditions dependent. Aiming for sowing by late September/early October depending on weather conditions.
- Tim Montgomery to supply contractor details for direct drilling of chicory
- Emma Bell to walk chicory paddocks weekly to monitor progress (satisfactory kill from herbicide spray and early emergence / seedling wellbeing).

2. WEED SPRAYING

A budget of \$15,000 (\$93.75 per ha over 160ha) been allocated for “Weed and Pest Control” in the 30th July 2015 Cash Flow Budget.

Pasture spray in late September/early October with a Baton & Valdo mix as per a recommendation from Farm Source (RD1). The cost of this is approximately \$108 per hectare, including assumed application cost – please note again these prices are based on RRP pricing and *could end up considerably cheaper than this*. If Frank is to use Owl Farm’s spray gear and no tractor or labour costs are factored in, this brings costs down to \$70 per ha. We haven’t yet confirmed final ha area to be sprayed, but e.g. Total of 43 paddocks at a score 2 & 3 less 7 chicory paddocks averaging around 1.7 ha = 36 paddocks x 1.7ha = 61.2 ha (Approximately). 61.2 ha x \$70 = \$4284, or \$26.78 per ha over 160ha.

Spring Pasture Spray			
Baton	1.5	kg/ha	\$ 33
Valdo	65	g/ha	\$ 31
Bonza	500	ml/ha	\$ 6
Application		\$/ha	\$ 38
TOTAL COST/HA			\$ 108

AREA TO BE SPRAYED

- Paddocks with a Pasture condition score of 2 & 3 that are not being selected for Chicory this spring should be sprayed (refer to condition scoring results)
- All new grass paddocks (less paddocks that will go back into chicory) should be sprayed
- Paddocks identified as being problem paddocks last year by Frank should also be sprayed – Mark Dodds will talk to Frank to determine these, but presuming that they are mostly the score 2 & 3 paddocks.

SPRAYING PROTOCOL

- It is important any paddocks selected for Chicory this spring are avoided
- Apply Baton & Valdo in late September/Early October or when soil temperatures are around 10°C
- Graze the area before spraying to reduce clover leaf and to expose the weeds to the spray, leave for 1 week to allow weeds to freshen up
- Although it is recommended that ProGibb should not be tank mixed with herbicides, fungicides or fertilisers, it can be added to a mix such as Baton & Valdo if precautions are taken. Mix the Baton & Valdo, then add the ProGibb and Contact at the last minute – ensuring the mix is applied straight away and not left in the tank for long periods of time.
- Do not graze sprayed pastures for two weeks following spraying

3. OVER-SOWING OF CLOVER

A number of paddocks (including some new grass paddocks) were highlighted as lacking clover during the pasture walks. Clovers are important as they are a high quality component of the sward, and provide a source of nitrogen helping support a sustainable pasture system. In the short term, the economic benefit of clover is difficult to measure as it takes up to 12 months to begin fixing adequate amounts of nitrogen, however in the long term, it is certainly very important.

There is potential that in some paddocks there are underlying reasons as to why clover is not persisting or present. Soil testing should be carried out initially to eliminate any other underlying issues before over-sowing of clover is to occur. Approximately 13ha was highlighted as paddocks with little to no clover.

The approximate cost of over-sowing with fertiliser is approximately:

	Cost/ha
S/S Clover @ 5kg/ha	\$63
Serpentine Super @50kg/ha	\$20
Application	\$70
Total estimated cost	\$153

KEY ACTIONS:

- A Baton/Valdo pasture spray will inhibit the establishment of any clover establishment this spring – at this stage, reducing problem weeds is a priority therefore the recommendation is to wait until AUTUMN to review clover over-sowing
- In the meantime, soil testing should be carried out to identify any fertility issues in these paddocks so there is time to correct this in the autumn
- It is probable that this clover remediation work is not as high a priority as 1) Chicory establishment and 2) Herbicide application to paddock score 2 and 3.

4. UNDER-SOWING RYEGRASS IN AUTUMN

Approximately 55% of the 78 paddocks on the farm scored are in the 2&3 category, meaning action is required. In some cases, paddocks have significant gaps that have been taken over by weeds, so it is important these areas are filled in with desired species such as ryegrass.

Measuring the economic benefit of under-sowing run out pastures is difficult as success rates certainly do vary. Some paddocks were specifically highlighted as important for under-sowing due to drill misses, weed burden and poor establishment. These should be targeted in autumn with an Italian with endophyte such as Lush AR37 or Asset AR37, which will perform for an 18 month – 2 year period before these paddocks are looked at for something more permanent. Italian ryegrasses are more rapid in establishment than perennials, with enhanced cool season growth.

	Cost/ha
S/S Lush AR37 @ 16kg/ha	\$160
DAP @ 150kg/ha	\$130
Drilling	\$190
Total estimated cost	\$480

5. PASTURE CONDITION SCORING FROM NOW ON FOR OWL FARM

The Pasture Condition Scoring will become an annual event to monitor the development of the pastures on Owl Farm – with autumn nominated as the better time to undertake this scoring.

6. RESEARCH INTO THE USE OF ALTERNATIVE PASTURE SPECIES

There is potential to investigate the use of alternative pasture species on Owl Farm such as cocksfoot's and fescues, and assess how they compare to perennial ryegrass varieties through trial work. This could also be incorporated in to a project that involves the students. Further discussion around this is required.

IN SUMMARY

- Paddocks 5, 6, 11, 15, 52, 56 and 45 will be selected for chicory spring 2016 sow. One paddock may be reviewed for chicory if a free draining score 3 paddock is nominated as a possible chicory / effluent paddock.
- Baton & Valdo mix will be sprayed to low scoring (2 & 3) paddocks, new grass paddocks (not chicory paddocks) and paddocks suggested by Frank as problem paddocks
- Under-sowing of Lush AR37 tetraploid Italian ryegrass or Asset AR37 diploid Italian ryegrass will be reviewed in the autumn following pasture condition scoring (after the weed spraying this spring).
- Over-sowing of clover will be postponed until the autumn due to chemical residuals from the Baton & Valdo mix – pasture spraying for weeds is the priority at this stage.
- Lead into our spring cropping paddocks for spring 2016 with an Annual Ryegrass by identifying candidate paddocks autumn 2016

TIMELINE OF EVENTS

Date	Key Action
First week in September	Organise cropping paddocks to be soil tested
Mid -September	Spray-out of paddocks going into chicory as per recommendation
Late Sep/Early Oct	Baton/Valdo weed spraying to occur when soil temp is around 10°C
Early October	Planting of S/S Chicory Seed when soil is 12°C and rising
Post-sowing	Monitor crops (PGWS)
Chicory 4 th Leaf Stage	Herbicide application of Sequence & Valdo @ 4 th leaf stage
Chicory 7 th leaf stage	First Grazing (approximately 8 weeks after planting)

Appendix

WEED & PEST CONTROL PROGRAMME - Nufarm

Sprayout - WeedMaster[®] TS540 (2.7- 4.0 L/ha) + Pulse[®] Penetrant (100 ml/100L water) + Dew 600 (400 ml/ha)

- WeedMaster rate based on hardest to kill species – old pastures need **4L/ha** for browntop, couch, paspalum, Mercer grass, Kikuyu.
- Pulse improves adhesion and penetration/uptake of WeedMaster - ensures consistent control of perennial ryegrasses; reduces rainfastness down to just 20 minutes.
- Dew - best insecticide option for springtails – excellent control with nil stock withholding period - spray and graze 3 days later (other insecticides 7 day WHP). Springtails numbers can exceed 30,000/m² in spring – seed treatments struggle under this pressure.

Sowing - use **treated seed**. No-tillage – broadcast **SlugOut at 10kg/ha** at planting for slug control.

Monitor Pests at establishment - inspect crop every 1-2 days for first few weeks after emergence for cutworm damage.

Cutworm can quickly devastate crops – lots of crops replanted over last few years. Damage – holes in leaves, leaves severed off and lying on soil, leaves devoured and only stumps of plants left, plants totally eaten to below ground.

No insecticides are registered for cutworm control in chicory. Synthetic pyrethroids are the best option – excellent soil activity and have widely been used in chicory with no residue issues. SP's are registered for cutworm in a wide range of crops and have relatively short stock withholding periods, 7-14 days.

- Apply **Kaiso 50WG at 200g/ha** or **Sheriff 100 at 200ml/ha** at the first signs of cutworm damage.

Spray the weeds - Valdo (65g/ha) + Sequence (0.5L/ha) + Bonza (500ml/100L water)

Apply as soon the chicory plants have reached the 2-4 true leaf stage (typically about 3-4 weeks after crop emergence). Better to spray when the weeds are small and accept some stunting of the crop rather than waiting to chicory all at 4 true leaf stage.

- **Valdo** – a range of broadleaf weeds (some weeds such as plantain and dandelions will not be controlled).
- **Sequence** – annual grass weeds (summer grass, smooth witchgrass, etc), ryegrass and other perennial grass weeds.
- **Bonza** – oil adjuvant to improve the performance of the herbicides.