



The effect of tetraploid and diploid swards sown with and without white clover on milk production



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Introduction

- ❑ Increased efficiency at farm level is required
- ❑ Must be achieved by increased use of grazed pasture
- ❑ What can we do to increase milk production from grazed pasture?
- ❑ Use different perennial ryegrass ploidies
- ❑ Renewed interest in the use of white clover



Objective

Investigate the impact of tetraploid and diploid swards sown with and without white clover on milk and pasture production

Materials and Methods

- ❑ 120 spring calving dairy cows –
 - Holstein Friesian, Jersey x Holstein Friesian, Norwegian Red x Jersey x Holstein Friesian cows

- ❑ 2 lactations (2014, 2015)

- ❑ Completely randomised design
 - 2 perennial ryegrass ploidies – tetraploid, diploid
 - 2 clover contents – grass-only, grass-clover

- ❑ 4 grazing treatments
 - Tetraploid only (TO) sward (Aston Energy, Kintyre, Twymax and Dunluce)
 - Diploid only (DO) sward (Tyrella, Aberchoice, Glenveagh and Drumbo)
 - Tetraploid + clover (TC) sward (+ 2 kg white clover/acre)
 - Diploid + clover (DC) sward (+ 2 kg white clover/acre)

Materials and Methods

- ❑ Separate farmlet of 20 paddocks for each treatment
- ❑ 30 cows per treatment
- ❑ Stocking rate: 2.75 cows/ha
- ❑ Nitrogen fertiliser: 250 kg N/ha
- ❑ Target concentrate supplementation: ~ 300 kg/cow

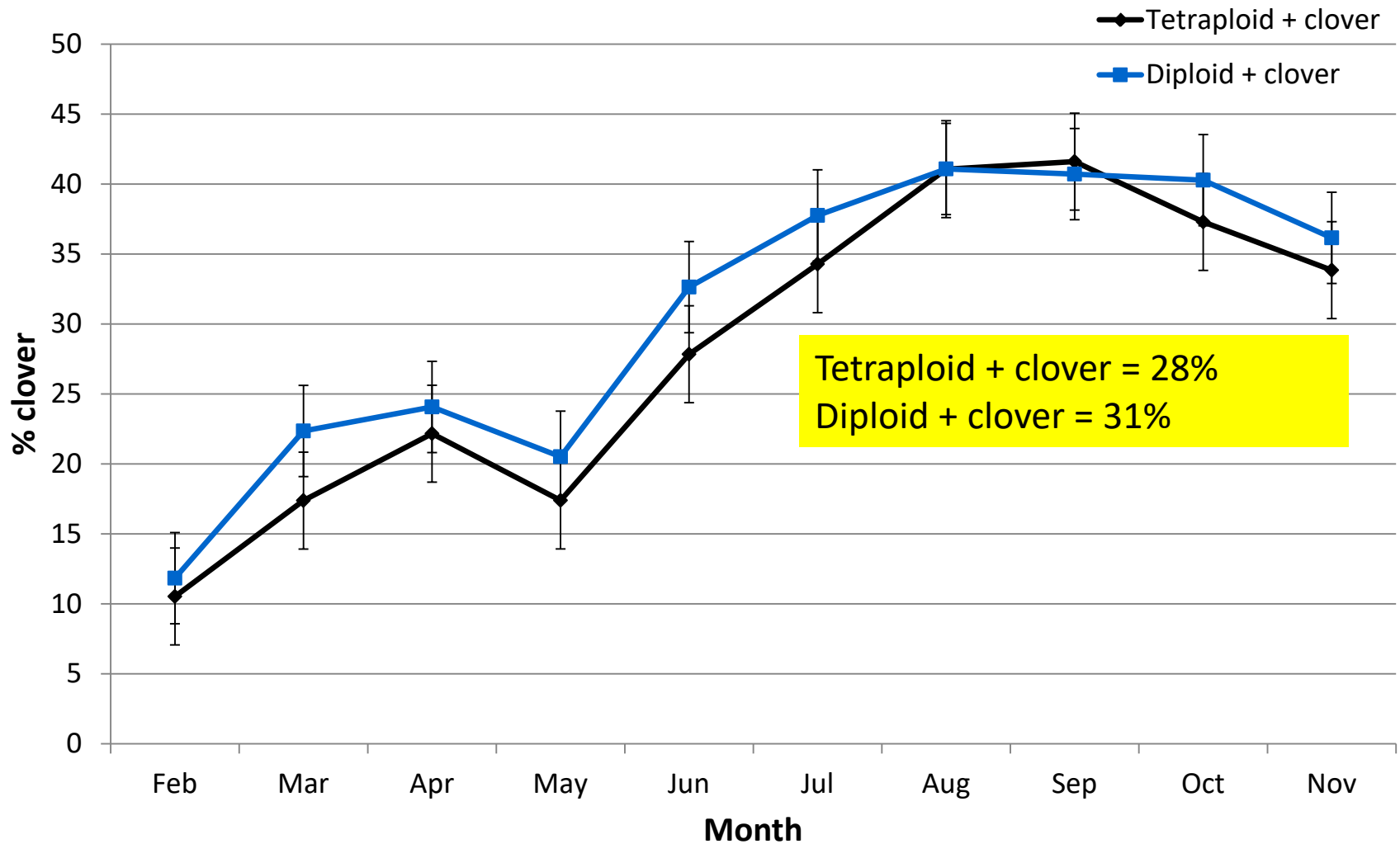
- ❑ Statistical analysis
 - Milk production – Mixed models (PROC MIXED) in SAS
 - Effect of ploidy, clover, breed and parity

 - Pasture production – Mixed models (PROC MIXED) in SAS
 - Effect of ploidy, clover and block

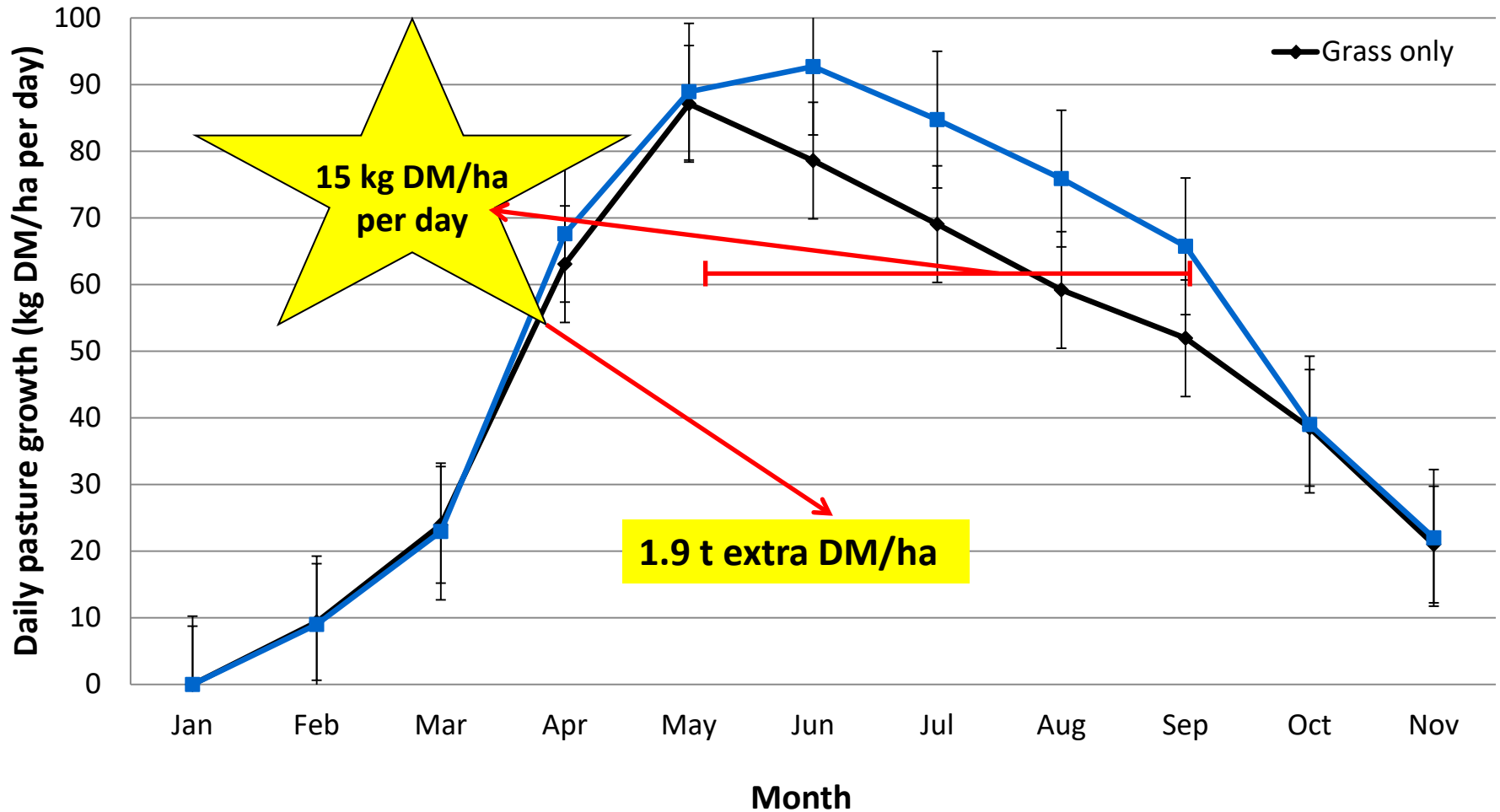
Results



Average Clover %



Daily Pasture growth



Pasture Results

	TO ¹	DO	TC	DC	s.e.	Ploidy ²	Clover	P x C
Dry matter (%)	18.7	20.0	16.4	17.0	0.21	***	***	+
Pre-grazing yield ³ (kg DM/ha)	1792	1901	1601	1678	49.4	+	***	NS
Post-grazing height (cm)	4.26	4.50	3.87	4.00	0.122	***	***	NS
Pasture removed ³ (kg DM/cow)	15.3	15.7	16.2	16.7	0.46	NS	*	NS
Pasture DM production (t DM/ha)	15.5	15.5	17.5	17.2	0.49	NS	***	NS

¹TO = tetraploid only; DO = diploid only; TC = tetraploid + clover; DC = diploid + clover

²Significance; *** = P<0.001; ** = P<0.01; * = P<0.05; + = P<0.1; NS = not significant; P*C = interaction between ploidy and clover

³Measured above 4 cm

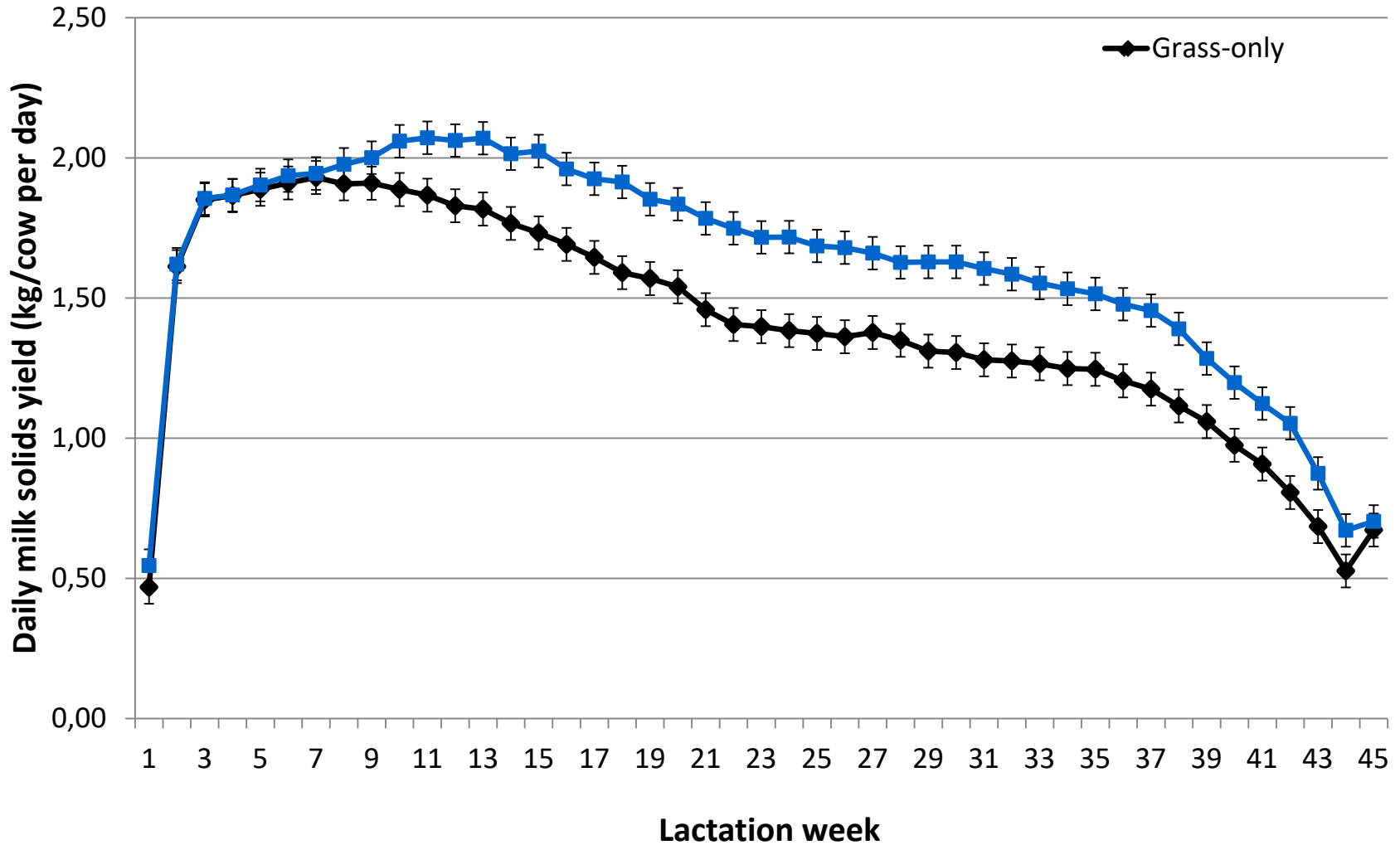
Milk Production Results

	TO	DO	TC	DC	s.e.	Ploidy ²	Clover	P x C
Concentrate fed (kg/cow)	336	336	339	338	6.5	NS	NS	NS
Silage fed (kg/cow)	327	302	340	381	11.4	NS	*	NS
Milk yield (kg/cow)	4972	4994	5783	5750	70.7	NS	***	NS
Fat (%)	4.69	4.64	4.62	4.61	0.057	NS	NS	NS
Protein (%)	3.82	3.74	3.74	3.74	0.007	+	NS	NS
Milk solids yield (kg/cow)	420	423	481	478	5.6	NS	***	NS
Milk solids yield (kg/ha)	1,162	1,145	1,328	1,316	194.3	NS	***	NS

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Daily Milk solids yield



Conclusion

- ❑ Ploidy had no effect on milk or pasture production
- ❑ Excellent milk and pasture production on WC swards
 - Increased milk solids per cow (+ 58 kg) and per ha (+ 168 kg)
- ❑ Challenges
 - Spring pasture availability on grass-clover swards
 - Grazing management in spring/autumn
 - Bloat
- ❑ Research on-going in these areas

Thank you!

Questions?

