

Herbage and milk production from perennial ryegrass and white clover swards in a grazing system

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Introduction



- Perennial ryegrass is the predominate forage grass used in temperate climates (Wilkins & Humphreys 2003)
- White clover most important forage legume in temperate regions (Frame and Newbould 1986; Whitehead 1995)
 - Clover can offer an alternative to chemical fertiliser
- Mixed grass and clover swards can increase DMI and milk production (Thomson et al., 1985; Harris et al., 1997; Riberio-Filho et al., 2003)
 - Particularly in the second half of the lactation (Riberio Filho, et al., 2003; Harris et al., 1998)



Objective

Compare herbage and milk production from a grass only sward receiving 250 kg N/ha and grass white clover swards receiving 150 or 250 kg N/ha in an intensive grazing system.

Treatments

- Three treatments stocked at 2.74 LU/ha
 - Grass only 250 kg N/ha/year (Gr250)
 - Grass white clover 250 kg N/ha/year (Cl250)
 - Grass white clover 150 kg N/ha/year (Cl150)
- Two year grazing experiment



Measurements

- Pre-grazing HM
- Pre- and post-grazing sward height
- Herbage quality (OMD, CP, NDF, ADF)
- Sward clover content
- Milk production
 - Milk yield - daily
 - Milk composition – weekly
- Animal BCS and BW – weekly
- Herbage DM intake – May, July, September



Fertiliser Application

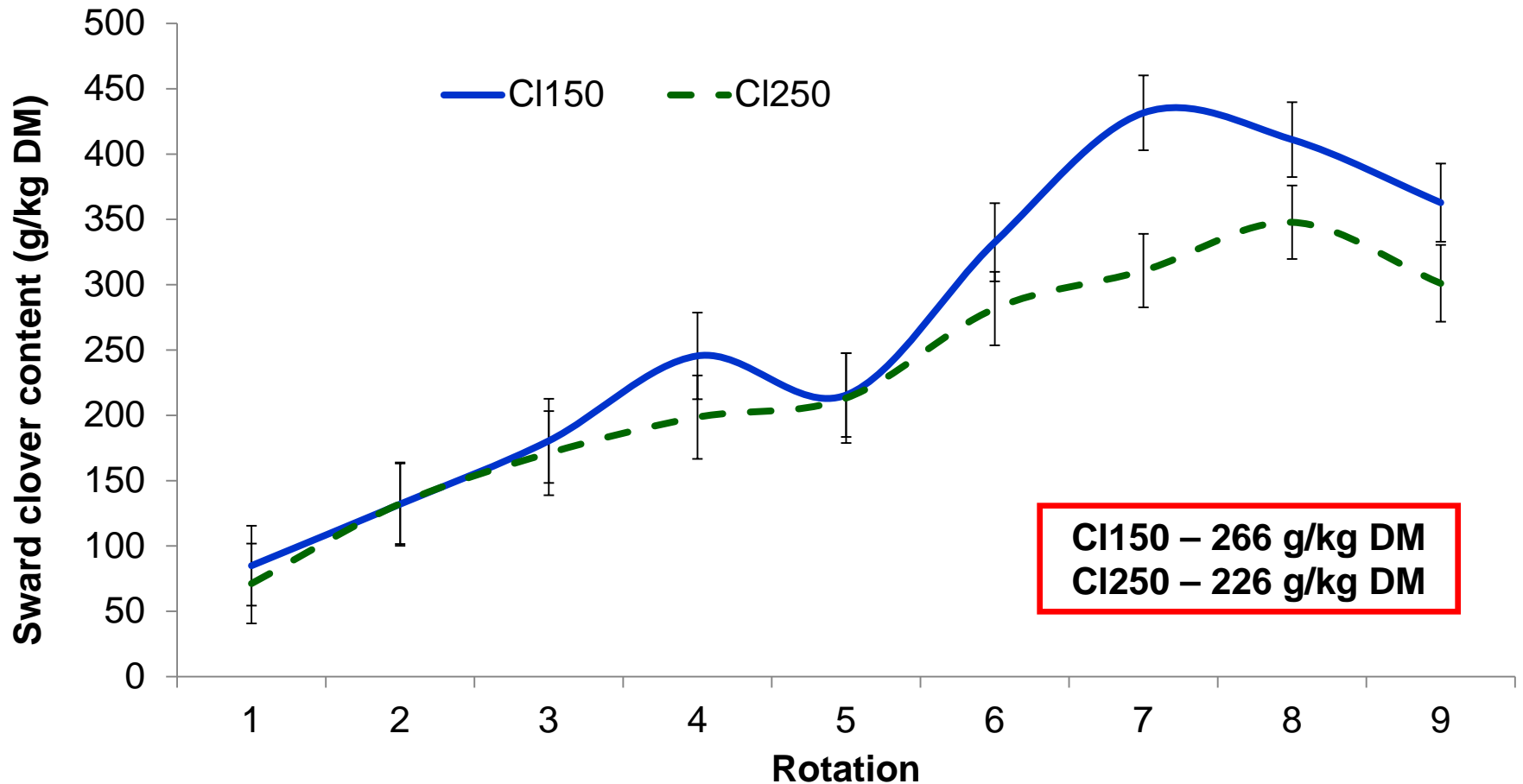
Rotation/Date	Grass 250 kg	Clover 250 kg	Clover 150 kg
Mid-late January	28 kg	28 kg	28 kg
Mid March	28 kg	28 kg	28 kg
15 th April (2 nd rot)	33 kg	33 kg	28 kg
6 th May (3 rd rot)	33 kg	33 kg	9 kg
27 th May (4 th rot)	27 kg	27 kg	9 kg
17 th June (5 th rot)	17 kg	17 kg	9 kg
8 th July (6 th rot)	17 kg	17 kg	9 kg
29 th July (7 th rot)	17 kg	17 kg	9 kg
19 th August (8 th rot)	17 kg	17 kg	9 kg
Mid September	33 kg	33 kg	12 kg
Total	250 kg	250 kg	150 kg

Results

Herbage production

	CI150	CI250	Gr250	SEM	Treatment	Year	Rot.	Treat. × Rot.
Pre-grazing sward height (cm)	9.8	10.4	10.1	0.20	NS	0.001	0.001	0.001
Post-grazing sward height (cm)	4.01	4.03	4.06	0.026	NS	0.001	0.001	0.001
Pre-grazing herbage mass (kg DM/ha)	1461	1537	1591	61.9	NS	0.001	0.001	0.05
Cumulative yield (kg DM/ha)	13050	14175	13288	420	NS	NS	-	-
Cumulative Silage yield (kg DM/ha)	4920	4776	5354	853	NS	NS	-	-

Average sward clover content



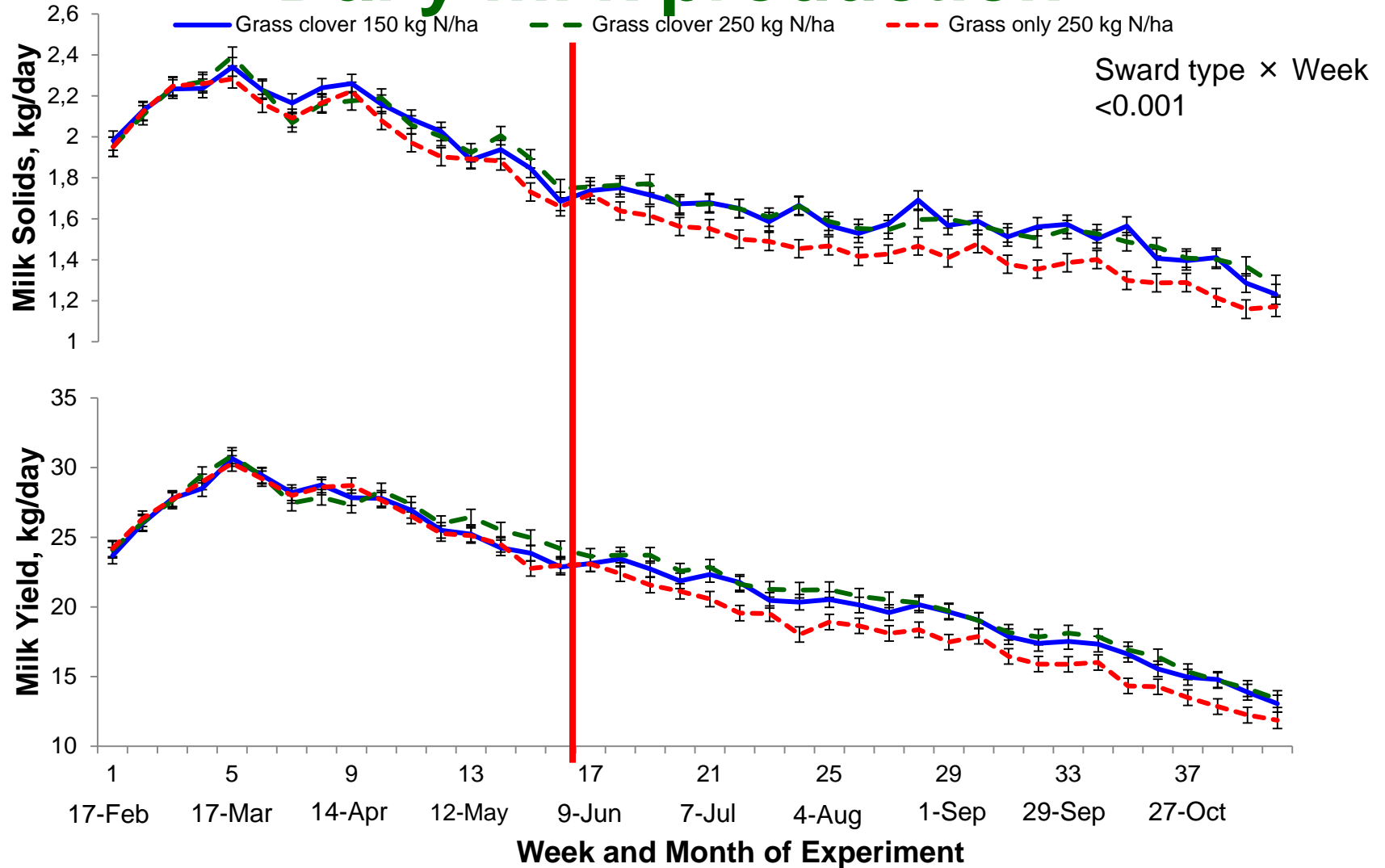
Sward chemical composition

	CI150	CI250	Gr250	SEM	Sward type	Rotation
OMD, (g/kg DM)	838.9	842.9	845.7	1.9	NS	0.001
CP, (g/kg DM)	232.4	236.3	227.0	4.0	NS	0.001
ADF, (g/kg DM)	239.0	237.7	240.3	2.8	NS	0.001
NDF, (g/kg DM)	338.3	338.5	358.3	3.8	0.001	0.001

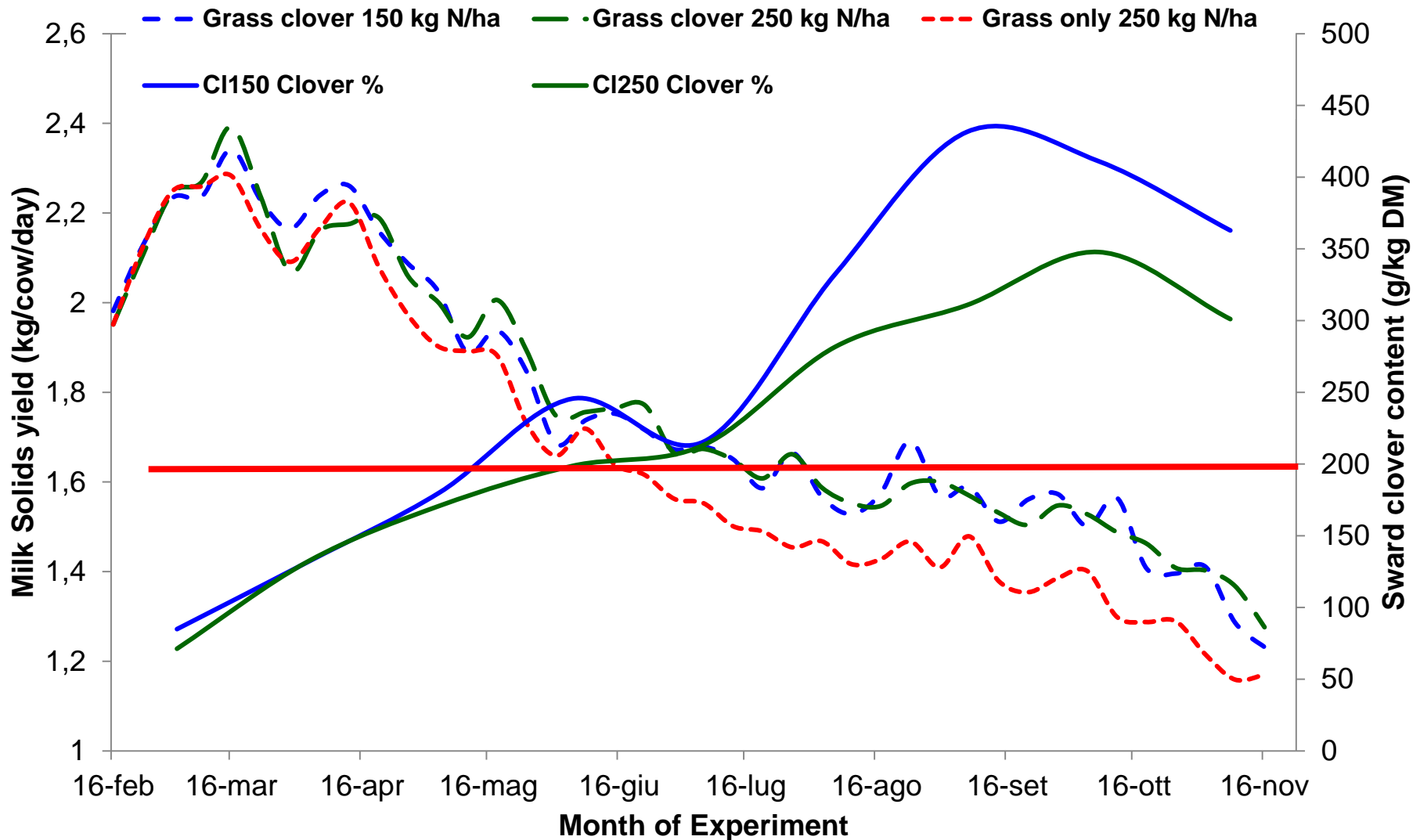
Animal production

	CI150	CI250	Gr250	SED	Treatment	Week
Milk yield, (kg/day)	21.8	22.1	20.9	0.33	0.05	0.001
Milk composition						
Fat, (g/kg)	4.62	4.50	4.46	0.04	0.01	0.001
Protein, (g/kg)	3.65	3.59	3.69	0.01	NS	0.001
Milk solids yield, (kg/day)	1.75	1.76	1.66	0.020	0.001	0.001
Body Weight, (kg/cow)	548	549	538	5.0	NS	0.001
Body condition score, 1-5	3.13	3.16	3.05	0.015	0.001	0.001
Cumulative milk yield, (kg/ha)	16167	16485	15478	529.7	NS	-
Cumulative milk solids yield, (kg/ha)		+ 80	1226	40.4	NS	-

Daily milk production

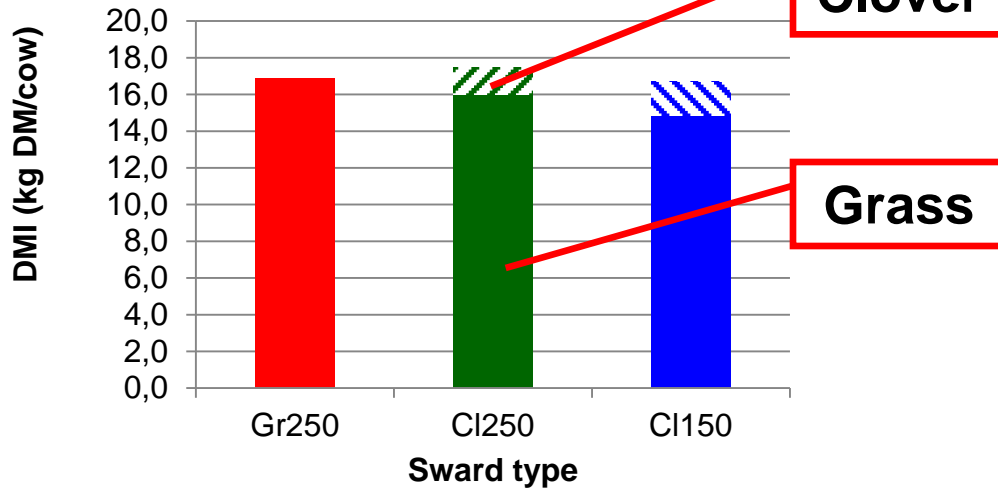


Daily milk solids and clover content

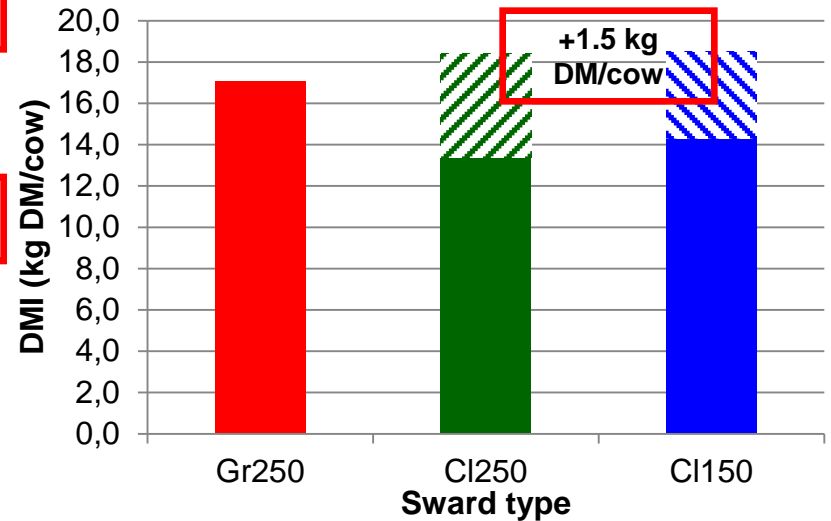


Herbage dry matter intake

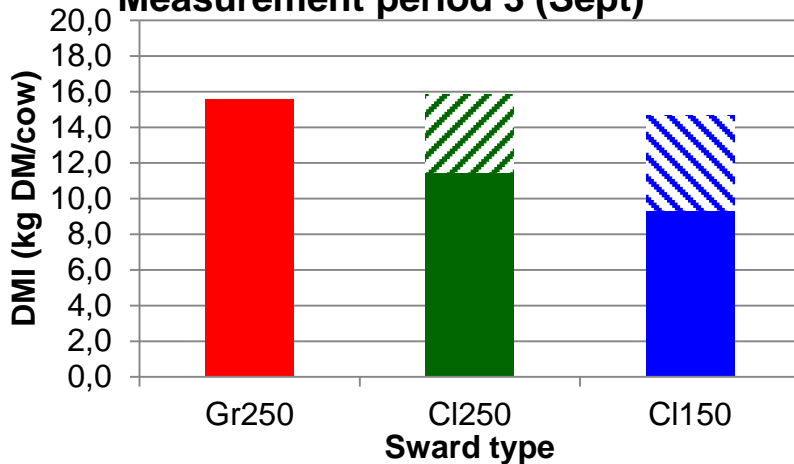
Measurement period 1 (May)



Measurement period 2 (July)



Measurement period 3 (Sept)



- Treatment < 0.01
- Measurement period < 0.001
- Treatment × measurement period < 0.001

Conclusion

- Similar herbage production on all treatments
- Reducing N fertiliser application in summer increased sward clover content by 4%
- Positive effect of clover on milk production regardless of N fertiliser application rate
 - Particularly in the second half of lactation
- Higher DMI on CI150 and CI250 in July compared to Gr250

Thank You Any Questions!



Acknowledgements

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