Fertilising grass-clover swards for pasture-based milk production systems

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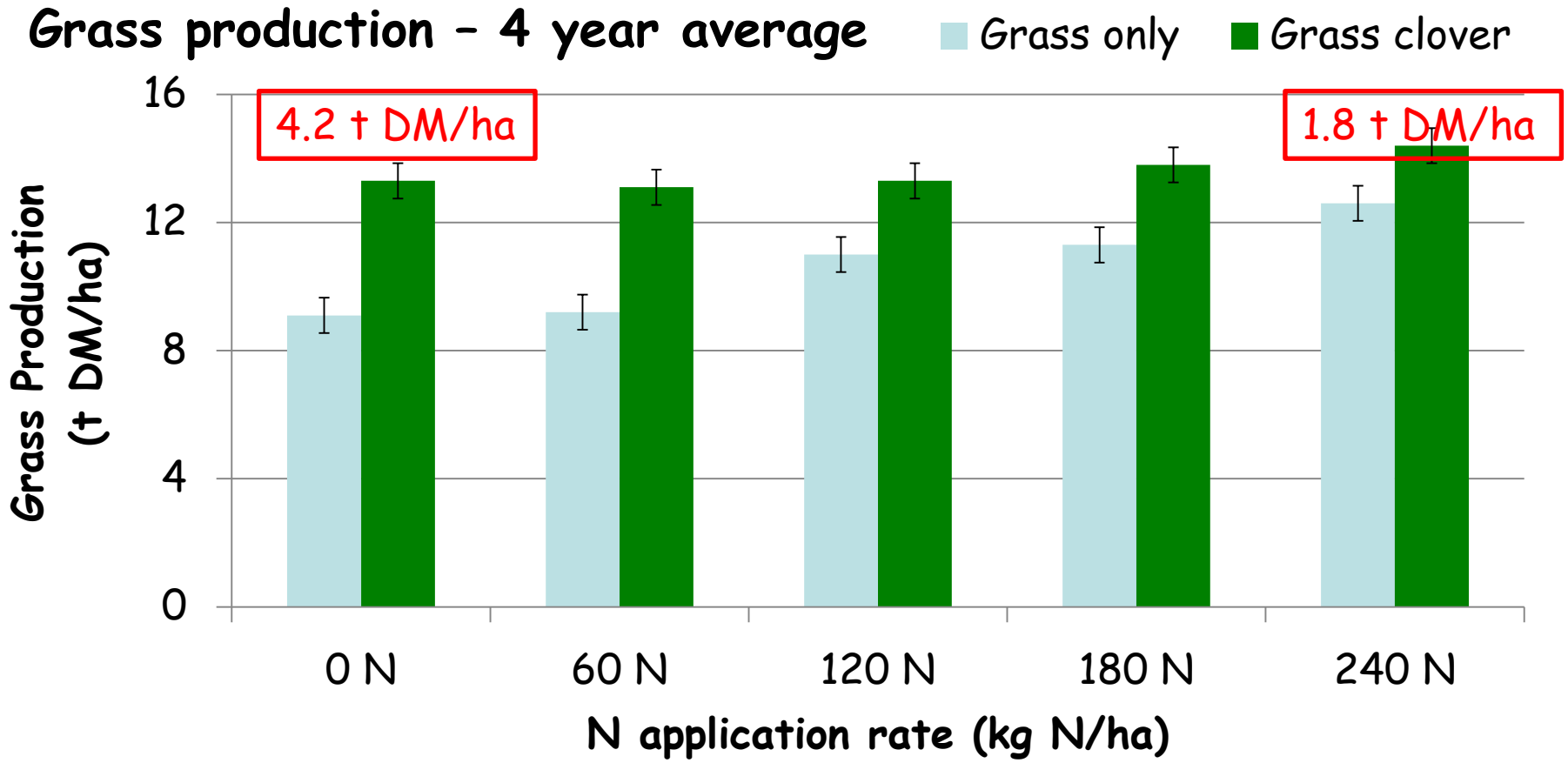
Introduction

- Post milk quota abolition: need to maximise Ireland's comparative advantage in pasture-based systems
- Renewed interest in forage legumes – white clover (WC)
  - Animal performance
  - Grass DM production
  - Environmental sustainability
- How to incorporate white clover into intensive pasture-based production systems ?

N fertiliser application and sward type



	0 N	60 N	120 N	180 N	240 N
Clover content (%)	33.3	30.6	27.0	21.7	19.6
N fixation (kg N/ha; 2011 - 2013)[1]	220	205	148	122	112

[1] Calculated using the N difference method, Enriquez-Hidalgo *et al.*, Grass Forage Science, In Press

Farm systems experiments with WC

- Clonakilty experiment – The effect of tetraploid and diploid swards sown with and without white clover on spring milk production systems
  - 4 treatments: Tetraploid only sward, diploid only sward, tetraploid + clover sward, diploid + clover sward
  - 30 cows per treatment stocked at 2.75 LU/ha, each treatment receiving 250 kg N/ha annually

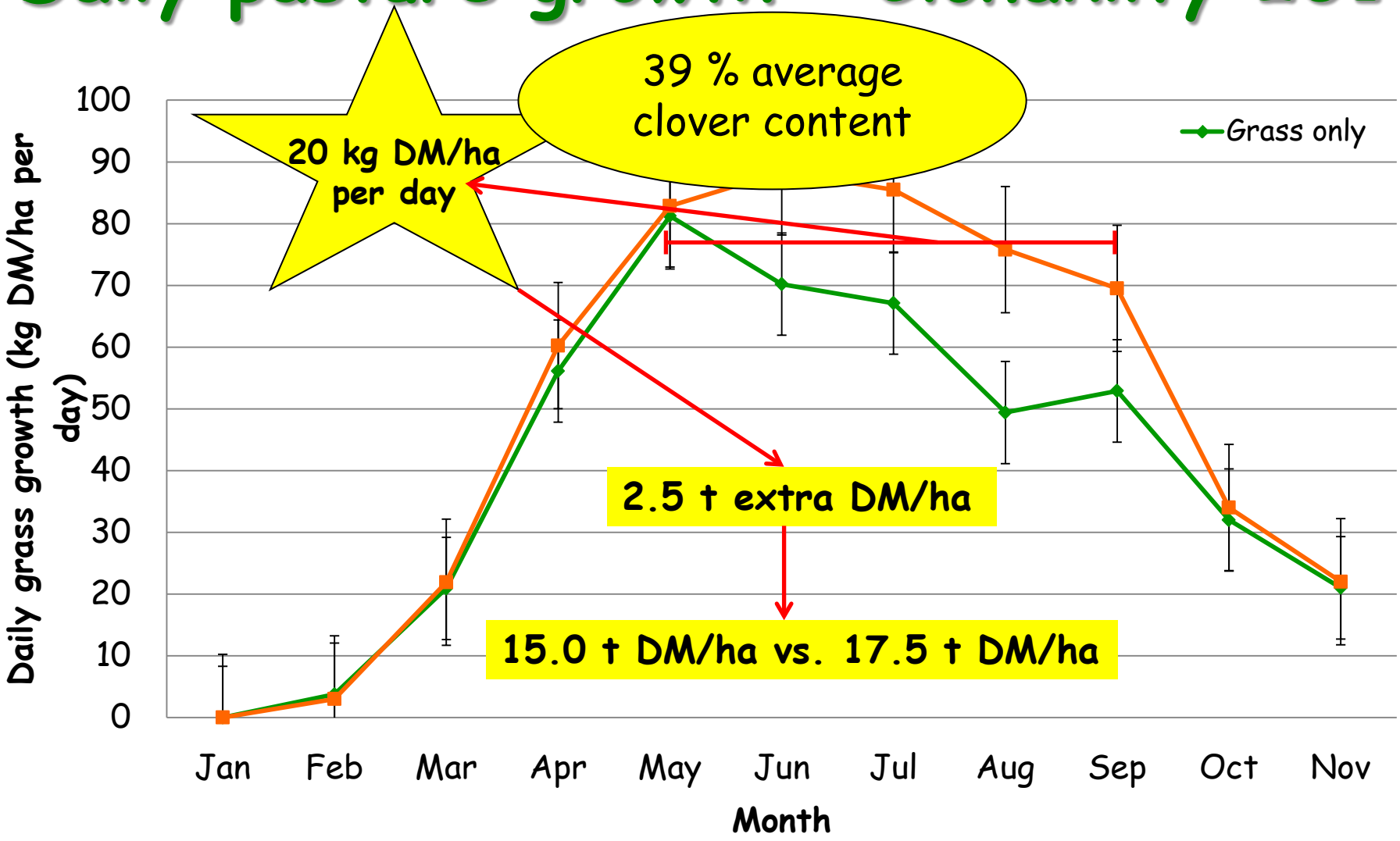
- Moorepark experiment – Comparison of animal and sward production from grass-only sward receiving 250 kg N/ha and grass-clover swards receiving either 150 or 250 kg N/ha
  - 3 treatments: Grass only 250 kg N/ha/year, grass + white clover 250 kg N/ha/year, grass + white clover 150 kg N/ha/year
  - Stocked at 2.74 LU/ha

Fertiliser application on grass-clover swards

	Moorepark & Clonakilty		Moorepark only
Rotation/Date	Grass-only 250 kg N/ha	Grass-clover 250 kg N/ha	Grass - clover 150 kg N/ha
Mid-late January	28	28	28
Mid March	28	28	28
April (2nd rot)	33	33	33
May (3rd & 4th rot)	60	60	18
June (5th rot)	17	17	9
July (6th & 7th rot)	34	34	18
August (8th rot)	17	17	9
Mid September	33	33	12

- Slurry applied to all treatments at same rate
- Chemical P and K applied as per soil P and K index status

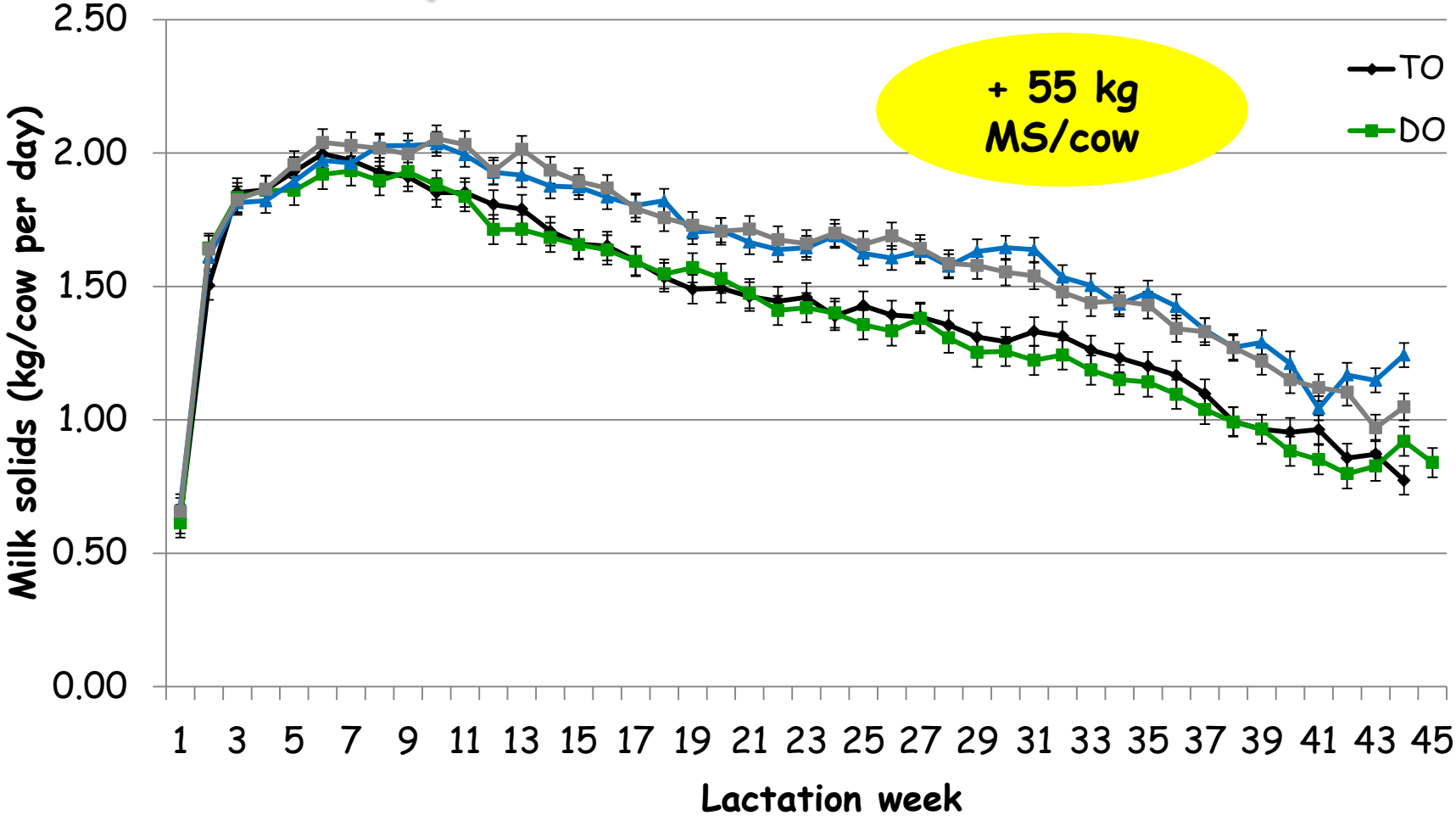
Daily pasture growth – Clonakilty 2014



Moorepark - Grass production & sward clover content (2013 & 2014)

Treatment	Grass 250	Clover 250	Clover 150
Annual Grass production (t DM/ha)	14.2	14.3	14.4

Clonakilty - Milk Production 2014



[1]TO = tetraploid only; DO = diploid only;

Summary

- As N fertiliser rate increases clover content and N fixation decreases
- Pasture DM Production response (0 to 2.5 t DM/ha)
- Milk Production response (+ 55 kg milk solids/cow)
- Initial results promising, further research required

Thank you & Questions?