Animal & Grassland Research and Innovation Centre

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Effect of post-grazing sward height on grass production and performance of four beef heifer genotypes

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Background

- Efficiently managed grazed grass is the cheapest feedstuff available to Irish beef farmers
- Maximising animal performance from grazed grass → basis of sustainable beef systems
- Evidence that grazing to a lower residual sward height (4 cm vs. 6 cm) improves yield and subsequent quality of swards
- Research examining post-grazing sward height in beef cattle is confounded with stocking rate

Objective

- To evaluate the effects of two contrasting grassland management systems on grass production and performance of four late-maturing crossbred breeding heifer genotypes

Materials and methods

- 136 heifers comprising of 4 genotypes:
  Limousin × Holstein-Friesian (LF),
  Limousin × Simmental (LS),
  Charolais × Limousin (CL),
  Charolais × Simmental (CS)

Genotypes

LM X FR

LM x SI

Genotypes

CH x LM

CH x SI

Materials and methods

- 136 heifers comprising of 4 genotypes:
  Limousin × Holstein-Friesian (LF),
  Limousin × Simmental (LS),
  Charolais × Limousin (CL),
  Charolais × Simmental (CS)

- Blocked randomly and assigned to one of two grassland management systems:
  grazing to a post-grazing sward height of either 4.0 or 6.0 cm.

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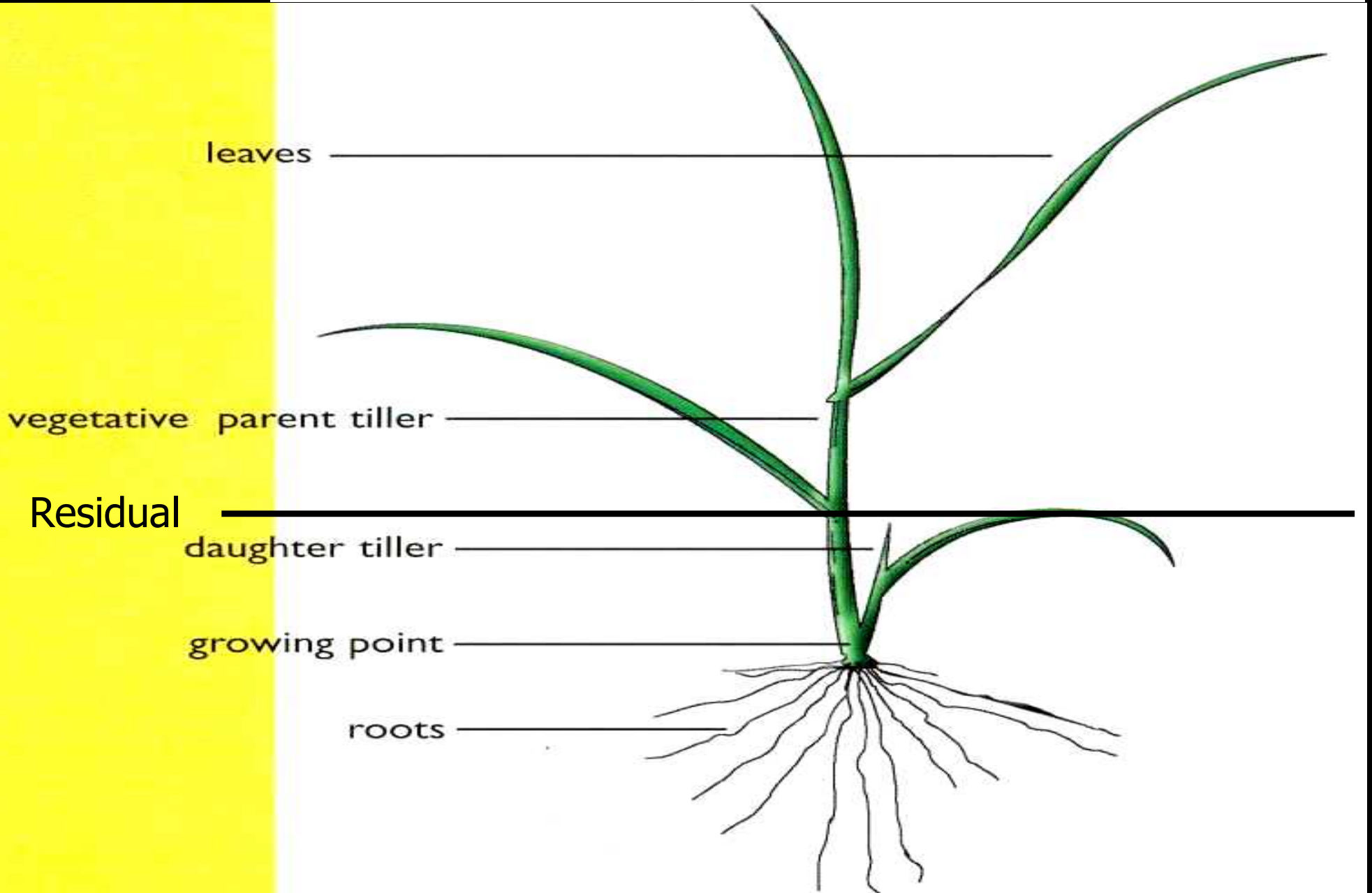
  grazing to a post-grazing sward height of either 4.0 or 6.0 cm.

- System:
  Rotationally grazed on 40 hectare (ha) block,
  SR was 2.5 LU/ha (195 kg organic N/ha for each grazing system),
  Grazing season – 8th March to 10th November,
  Fresh herbage - once target post-grazing residual height achieved,
  Silage conservation (4th Jun) - 45% of land area
  Herbage surplus to grazing requirements removed as silage

Seed heads removed early

No build up of dead material in base

Weeds or poor grasses can't compete



Measurements

Animal:

- Live weight, body condition score, skeletal / fat / muscle measurements & scores
- Intake: grazed grass, silage (& supplementary concentrate)
- Fertility

Sward / forage:

- Pre- & post-grazing sward height, mass, nutritive value
- Herbage growth
- Farm cover
- Grass silage yield & nutritive value.
- Annual feed budget constitution (system component basis)

Financial (€):

- Financial performance/profitability of the breed types & systems
- ICBF Index evaluation

Breeding programme

- **High genetic merit late-maturing "continental" SIRES**

Year 1:

- Terminal Sire - Blonde d'Aquitaine
  - Easy-calving / High BCI *****
  - Introducing a new outcross breed not present in the maternal genotype pool will allow a valid comparison between the heifer genotypes (avoiding confounded results caused by heterosis)

Future:

Cow breed	Sire Breed	
Limousin × Friesian	**Terminal (e.g. L - heifers, BB - mature)**	
Limousin × Simmental		**(S, L)**
Charolais × Limousin	**50% "Maternal"**	**(L, C) & 50% Terminal (e.g. BB)**
Charolais × Simmental		**(S, C)**

Grassland results

- Pre-grazing herbage mass -1920 kg DM/ha
- PGSH: 10.4 cm
- PGSH: 4.4 & 5.6cm
- Similar animal performance
- 20 tonnes DM surplus grass (26 vs. 6 t DM) from 4 vs. 6 cm
- Seven rotations completed for the duration of the year (242 days).

- **Reseeding:** 18% - Sept 14
  - Four varieties were sown as monocultures in combination with 10% clover (Crusader): Bealey, Aston Energy, Tyrella and Abermagic

Grassland results contd.

Variable	4 cm system	6 cm system
Pre-grazing herbage mass (kg DM/ha)	1936	1984
Post-grazing herbage mass (kg DM/ha)	521	876
Pre-grazing herbage height (cm)	10.3	10.5
Post-grazing herbage height (cm)	4.4	5.6
Mean Dry Matter (%)	19	19
Sward density (kg DM/cm/ha)	373	360

Performance of four heifer genotypes on two grazing management systems

	Genotype					Grazing system		
	LF	LS	CL	CS	Sig	4 cm	6 cm	Sig
Initial live weight (kg)	419^{a}	453^{b}	451^{b}	470^{c}	*	449	447	NS
Final live weight (kg)	569^{a}	595^{bc}	585^{ab}	612^{c}	*	588	594	NS
Daily live weight gain (kg)	0.68	0.65	0.61	0.65	NS	0.63	0.67	NS
Initial body condition score (0-5)	3.04^{a}	3.18^{b}	3.16^{b}	3.23^{b}	*	3.15	3.16	NS
Final body condition score (0-5)	3.26	3.20	3.26	3.22	NS	3.22	3.25	NS
Body condition score change (0-5)	0.22^{a}	0.02^{b}	0.11^{ab}	-0.01^{b}	***	0.07	0.10	NS

LF = Limousin×Holstein-Friesian; LS = Limousin×Simmental; CL = Charolais×Limousin; CS = Charolais×Simmental

Breeding 2009

- **Breeding season:** Apr 29–Jul 15 (11 wk)
- **Synchronization:** (PG x 2)
- **Sires:** Blonde d'Aquitaine
  - AI (GWJ & WTI) + stock bulls (LSX)
- **Pregnancy rate:** 94%
- **Mean exp. calving date:** Mar 12th

Conclusions

- Potential exists to increase herbage production by grazing to a lower post-grazing residual height without sacrificing animal performance
- Limousin × Friesian heifers were lightest and Charolais × Simmental heifers were heaviest with Limousin × Simmental and Charolais × Limousin intermediate

Questions ?