GrassCheck Farm Walk

Harold, Mark and Jack Johnston

Ahoghill, County Antrim

Friday 26 April 2019

GrassCheck is supported by:

Department of Agriculture, Environment and Rural Affairs www.daera-ni.gov.uk

The Research Challenge Fund

CIEL Centre for Innovation Excellence in Livestock

AgriSearch, AFBI & CAFRE would to like to thank the Johnston family for hosting this event

Harold Johnston – Farm details

Stock numbers:

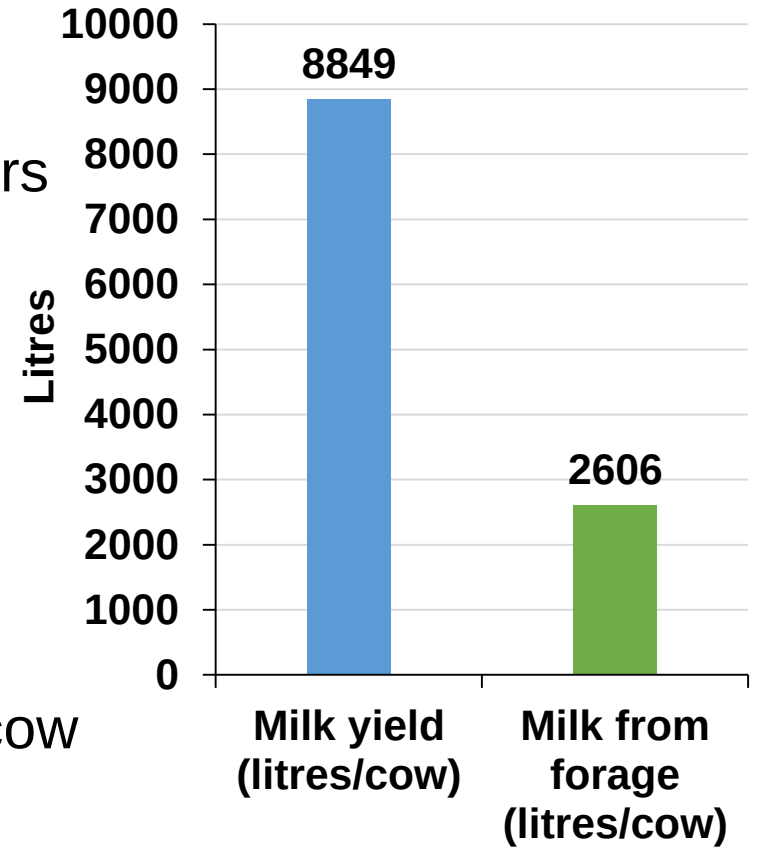
- 267 Holstein-Friesians cows
- Youngstock:
  - 95 0-1 year old
  - 95 1-2 year old

Land area:

- 159 Ha grassland
- 52.6 Ha in grazing platform
- Farm layout provides excellent accessibility to paddocks
- Turn out – Mid-late March

Johnston's – Rolling herd performance

- Concentrate fed = 2.8 t/cow/year
- Feed to yield – In parlour, adjust feeders depending on grazing and weather conditions
- Milk quality:
  - 3.95% butter fat
  - 3.37% protein
- Target to increase MFF to 3000 litres/cow



Farm aim: Focus on grass and cow genetics to optimise system

2018 growing season – Plots and dairy farms

Plots:

- **10.8**t DM/ha grown
- Delayed initiation of growth by 3 week
- Summer yield ⬇ **1.2**t DM/ha
- Strong recovery in September

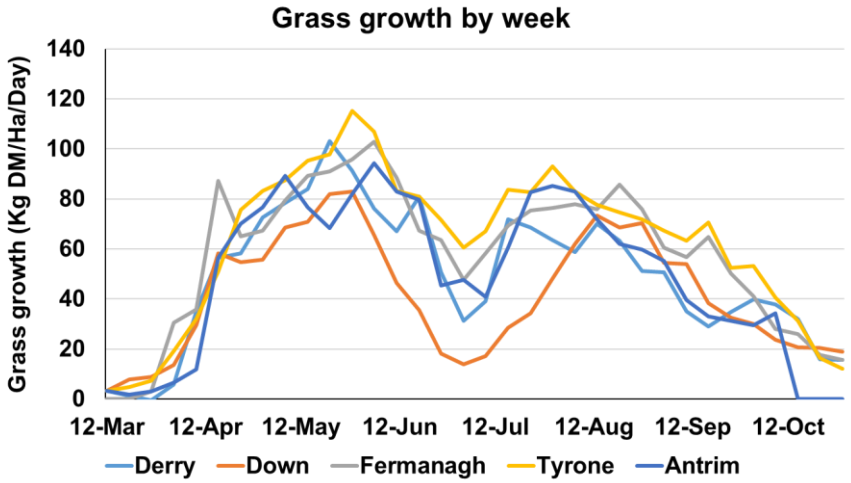


Fig 1: 2018 Grass growth curve across GC dairy farm

Dairy farms:

- Average growth on dairy farms = **11.7**t DM/ha
- Lower production in early spring
- County Down significantly impacted in June and July

	Total growth (kg DM/ha)
Antrim	11,922
Derry	12,183
Down	10,536
Fermanagh	12,264
Tyrone	12,816

Grass quality in 2018

- Significantly higher grass quality in 2018 vs. 2017
- Increase in dry matter content (+2.9%)
- Significant differences across region and month

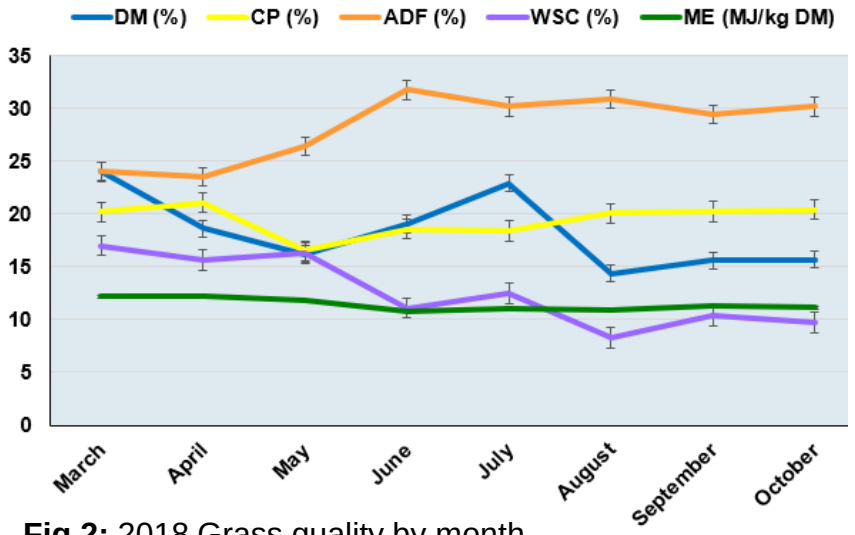


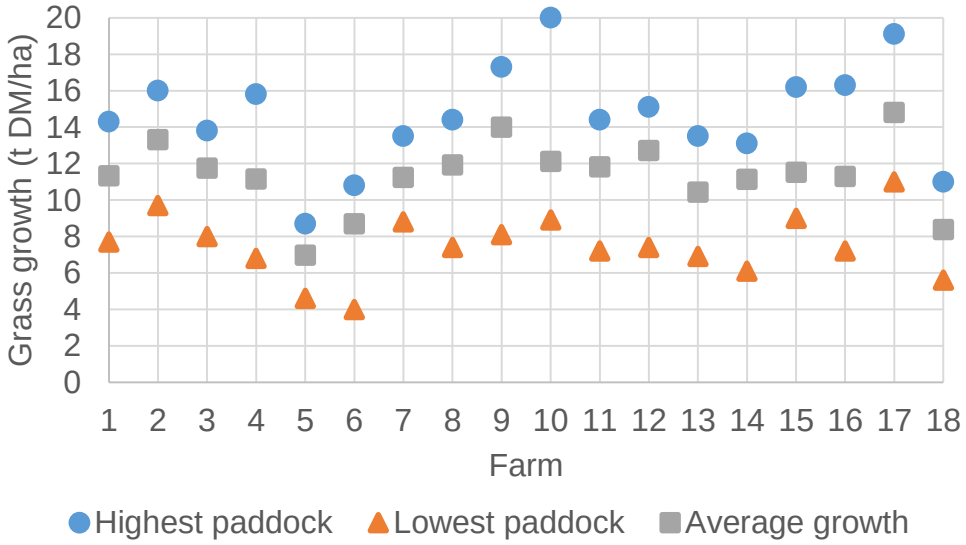
Fig 2: 2018 Grass quality by month

Table 1: On-farm grass quality by county

	Antrim	Derry	Down	Fermanagh	Tyrone
DM (%)	16.8	18.0	20.3	17.0	17.2
CP (%)	19.7	20.7	19.4	17.6	19.8
WSC (%)	11.6	12.5	12.9	12.3	11.9
ME (MJ/kg DM)	11.2	11.6	11.5	11.1	11.4

Grass growth on NI farms

Average, highest and lowest growth fields for GrassCheck dairy farms during 2018



Variation between highest and lowest growth paddocks = **7.2t DM/ha**

Feed value lost = £974/ha

Grass measurement key to identifying poor performing areas

Causes of variation between paddocks:

Soil management

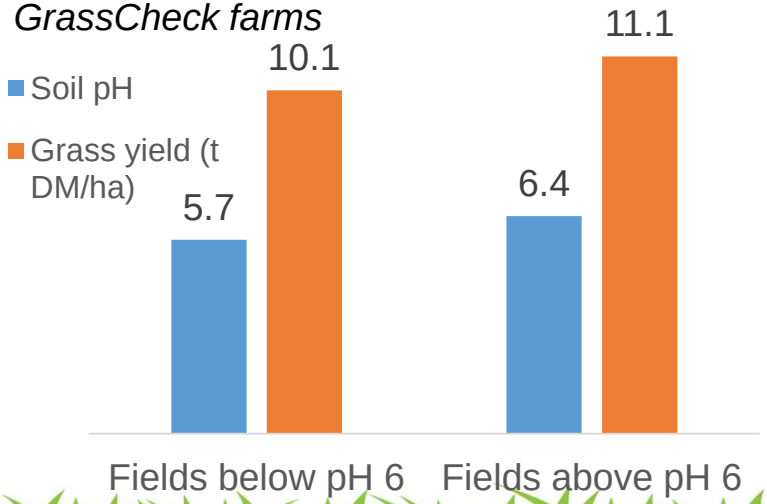
43% of NI grassland soils currently require lime (GrassCheck dairy farms = 16%)

Soil pH decreases over time. Fall in pH is quicker:

- in high rainfall areas
- high N fertiliser rates:

To neutralise CAN @ 250kg N/ha = 0.5t lime

Average grass yield during 2017 and 2018 from low and high pH soils on the GrassCheck farms



Sward management

Over time perennial ryegrass content decreases in swards, leading to:

- Reduced yield and quality
- Increased weed burden
- Reduces N response to fertiliser

Perennial ryegrass (PRG) contributions to grass swards over time

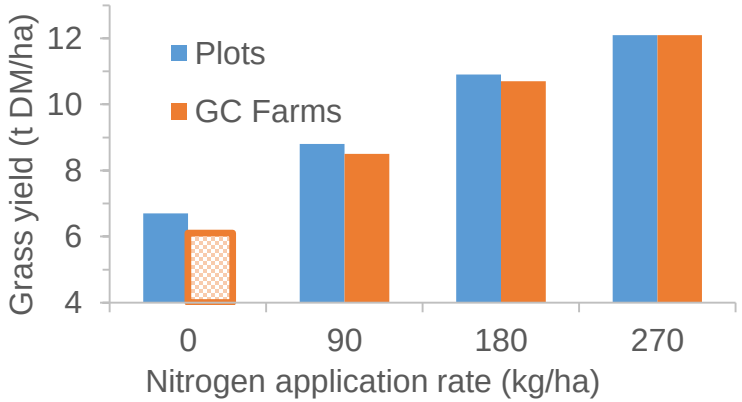
Age	PRG content (%)	Yield (t DM/ha)	Grass ME (MJ/kg DM)	Feed value lost (£)
1	95	13.5	12.0	
3	90	12.6	11.8	197
5	80	11.2	11.5	491
7	70	9.8	11.3	759
9	60	8.4	11.0	1030
11	50	7.0	10.8	1279

Grazing swards – fertiliser management

- Plot and farm data show cost effective response to N throughout season at high fertiliser application rates

- 1kg N fertiliser @ £0.8/kg delivers:
  21kg DM grass @ £0.136/kg = £2.86
  Return on Investment = **3.6:1**

Grass response to varying N application rates on plots and Grasscheck farms



RB209 Nitrogen fertiliser applications for swards growing 12+ t DM/ha

	Feb	Mar	Apr	May	June	Jul	Aug	Total
kg/ha	30*	40	50	50	40	30	30	270
units/ac	24	32	40	40	32	24	24	216

**If early spring grazing*

Phosphate
- Index 2- soil = 20kg/ha (16 units/ac)
- Spring application

Potash
- 40% swards deficient
- Index 1= 30kg/ha (24un/ac)
- Autumn application

Sulphur
- Widespread deficiency
- 75 kg/ha (60 units/ac)
- Spring/summer application

Grass production – Harold's farm

Soil fertility

- Whole farm tested in 2015
- Significant investment in lime and DAP
- Farm retested Spring 2019 – plan to move to 3 year testing

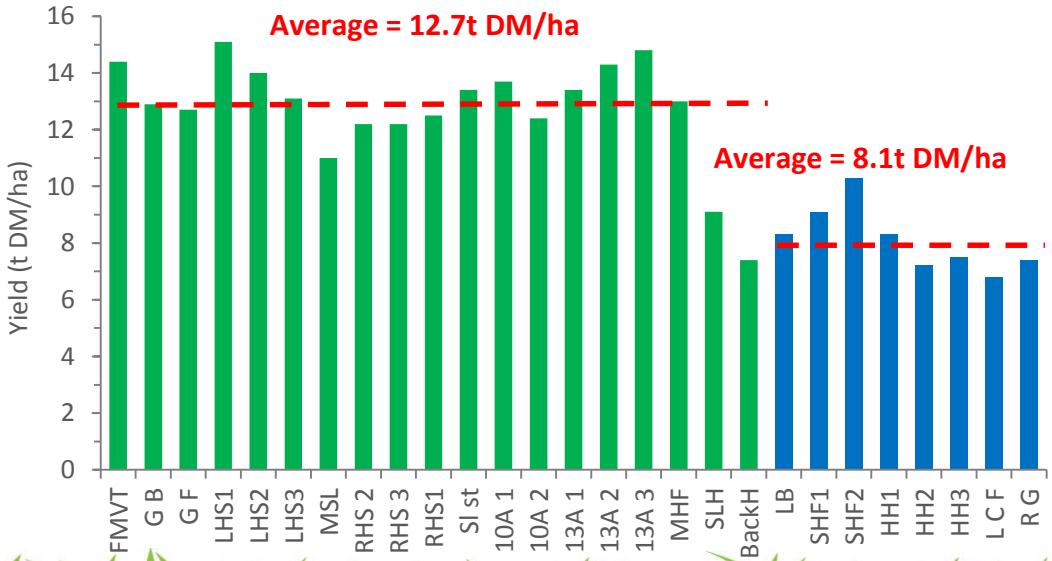
Proportion of farm (%) at/above target indices

	2015	2019
pH	70	89.5
P	81.5	96.5
K	65	84.5

Grass performance

- Weekly measurement used to identify under performing paddocks
- Average production:
  - All-season grazing: 12.7t DM/ha
  - Grazing after first cut: 8.1t DM/ha
- Reseeding based on grass production

2018 total grass production across the grazing platform



Harold's farm - grass production

- Total growth 2018 = **12.6t** DM/Ha
- Total grown to date = **2.4t** DM/Ha

  (28th Feb – 22nd Apr)
- Current growth rate = 66.7 kg DM/Ha/Day
- Average farm cover = 2526 kg DM/Ha

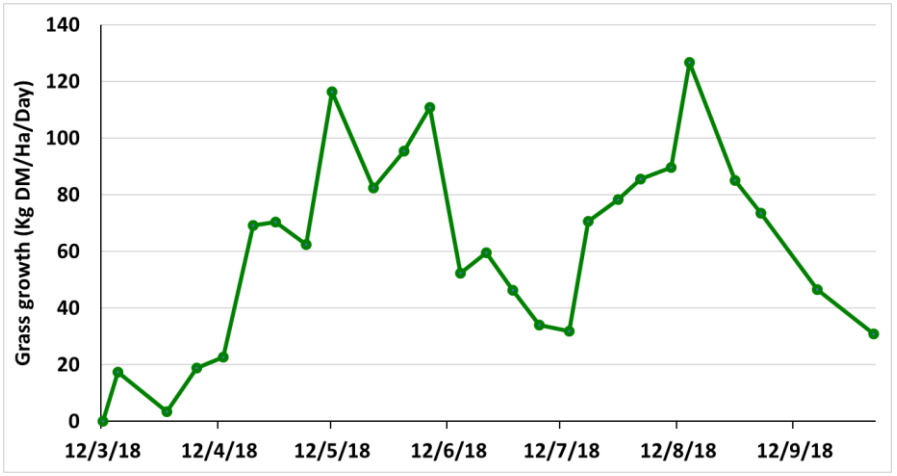


Fig 3: 2018 Grass growth curve

Grass measuring very important to the farm:

- Can monitor each fields performance
- Can see and manage surpluses and deficits

Target 3000 kg DM/ha pre-graze covers

Surplus's

- Take out bales
- Pre-mow high covers in Mid Summer

Deficit's

- Bring in silage ground
- On/Off grazing

Seasonal management - on Harold's farm

Early Season:

- Aim to get slurry and fertiliser out early – depend on soil temp and ground conditions
- Soft ground conditions – Judge turnout year to year (use On/Off grazing)
- Build cow numbers

Mid-Season:

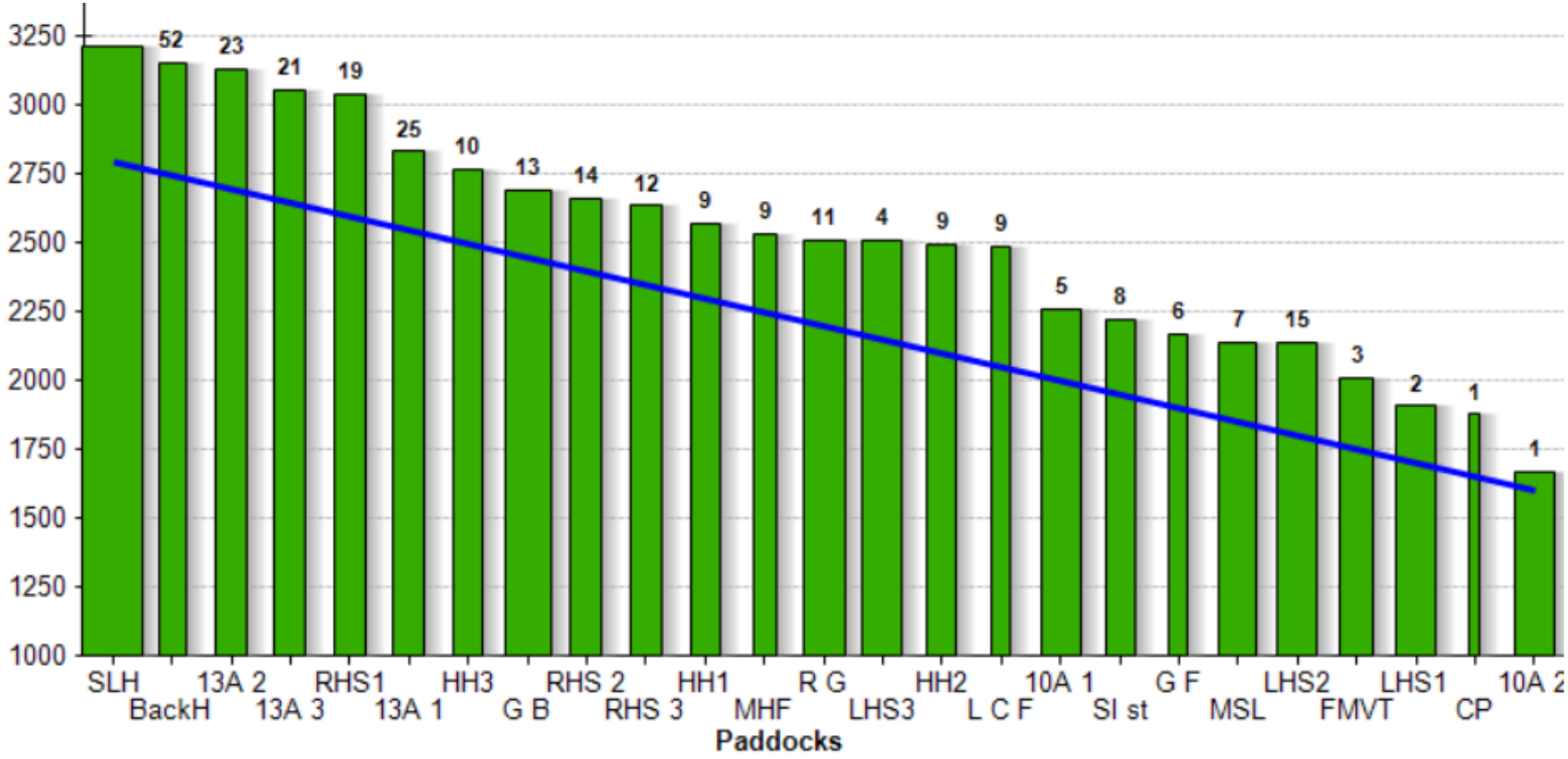
- Weekly grass measuring essential
- Make informed decisions from data recorded on AgriNet (Fertiliser/Reseeding)
- Pre mow swards – help to achieve grazing residuals of 1700 kg DM/Ha

Late Season:

- Build up covers for autumn grazing
- Remove cull cows not needed in system
- Feed silage at night, if needed to build covers

Grass measuring gives us confidence to make decisions

Current grass wedge (22nd April 2019)



- 70 cows out full time
- Rest out during day and in at night

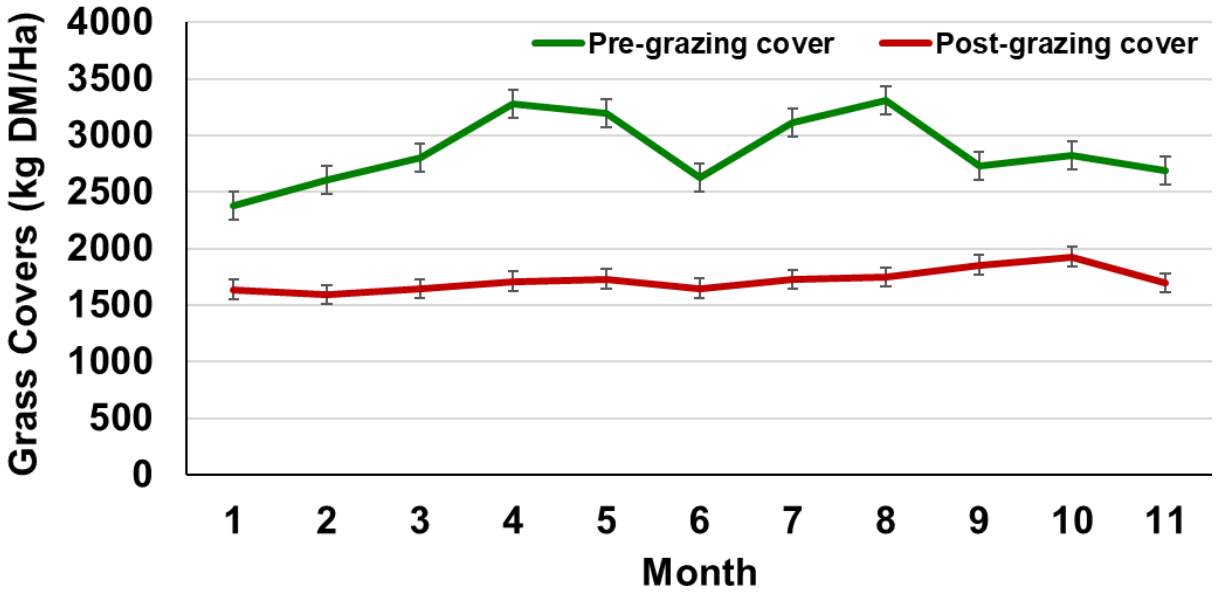
On-farm grazing efficiency

Achieving target residuals key to:

- Higher intakes of good quality pasture
- Reduction in herbage wastage
- Higher quality re-growths
- Shorter re-growth interval
- Improved response to N fertiliser

Table 2: Grazing efficiency on-farm

	2017	2018
Average pre-grazing cover (kg DM/ha)	3074	3007
Average post-grazing cover (kg DM/ha)	1674	1717
Average utilisation (%)	0.85	0.86



Achieving target residuals key to increasing grazing efficiency

Fig 4: GrassCheck dairy farms pre- and post-grazing covers in 2018

Pasture allocation frequency: 12, 24 or 36hr?

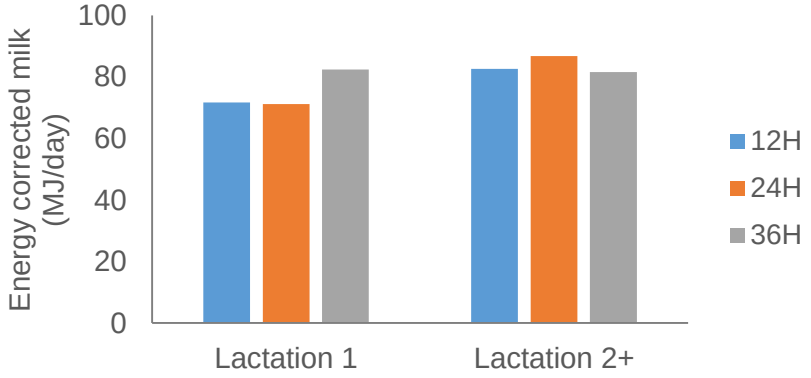
- NI dairy herds typically graze as one mob with a range of parities, cow energy requirements, high competition
- Can heifer performance be improved with lower allocation frequencies?

<u>Experiment:</u>

- 90 spring calving dairy cows (27 heifers)
- Two grazing periods: May – July, August - September
- Grass allocation = 15kg DM/cow/day

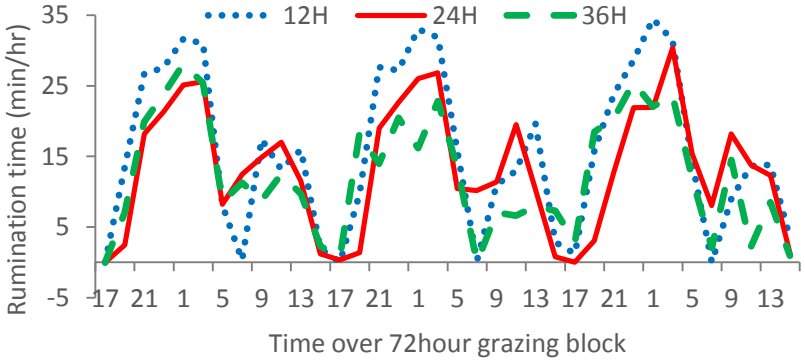
72 Hour Grazing Block

Impact of frequency of pasture allocation on ECM of heifers and cows



Highest heifer energy corrected milk yield from 36H pasture allocation

Impact of frequency of pasture allocation on rumination behaviour of heifers



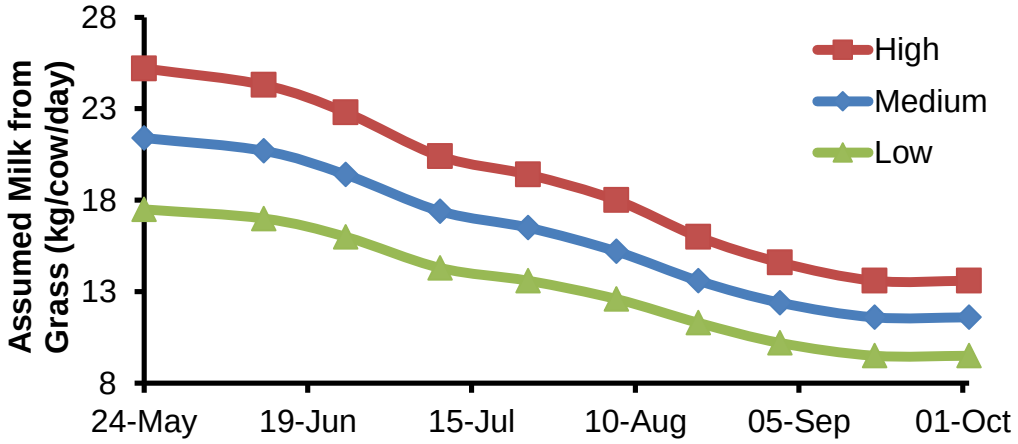
Increased energy expenditure with 12H heifers for both rumination and grazing

Value of grass: Optimum M+

- Well-managed grazed grass remains high quality feedstuff throughout season
- What are optimum M+ values for dairy cows?

Experiment:

- 57 spring calving cows (DIM: 157, MY: 32kg/cow)
- 3 M+ treatments



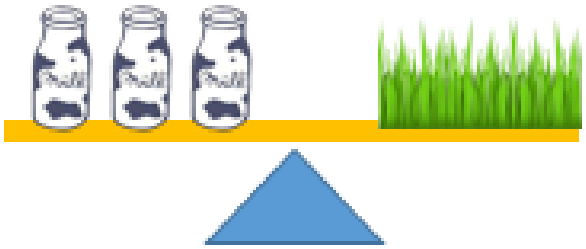
Medium M+ value = good balance between reducing feed cost and maintaining cow performance.

Assuming High M+ values will return highest MOC but resulted in thinner, lighter cows

	High	Medium	Low
Concentrate intake (kg/cow/d)	1.8	3.2	4.9
Milk Yield (kg/cow/d)	19.0	21.8	23.8
Milk F+P yield (kg/cow/d)	1.51	1.70	1.84
Liveweight (kg/cow)	547	556	579
Margin over feed costs (£/cow/d)	5.02	4.92	4.54

Impact of grazing intensity on high yielding cows

- Constant balance between grass utilisation and animal performance
- What is the optimum post grazing residual for high yielding cows?



Experiment:

- 63 spring calving cows (MY = 36.1kg/cow/day, DIM = 67)
- Concentrate allocation: 7kg/cow/day
- 3 grazing intensities: **Tight** (5.2cm) **Moderate** (6.1cm) **Lax** (6.8cm)

Impact of grazing intensity on grass and cow performance

	Tight	Moderate	Lax
Post-grazing sward height (cm)	5.2	6.1	6.8
Grass ME content (MJ/kg DM)	11.9	11.7	11.7
Grass utilisation efficiency (%)	81	69	62
Milk yield (kg/cow/day)	30.5	32.2	33.2
Milk fat + protein yield (kg/cow/day)	2.02	2.16	2.23
Grazing stocking rate (cows/ha)	7.8	6.7	5.6

High yielding cows = target residual **2000kg DM/ha** (6cm) but consider:

- Sward quality
- Lower stocking rates

Harold's farm - Grazing management

- All cows grazed as one group
- Fed to yield in parlour with M+ values changed regularly throughout season
- Pre-mowing to maintain quality
- Focus on cow genetics for grazing

2018 grazing season performance

Number of grazings per paddock	6.0
Pre-grazing cover (kg DM/ha)	3023
Post-grazing cover (kg DM/ha)	1780
Utilisation rate (%)	81.0

2019 grazing season

Turn-out:

23 Feb	35 cows, group increased with low yielders/in-calf cows over next few weeks. Housed occasionally
26 Mar	All cows out (268) day time
13 Apr	All cows day time + 40 at night

Proportion of platform grazed: 80% grazed, currently into second rotation

<u>Current performance:</u>

Milk yield: 30.2 litres/cow/day
M+ value: Cows: 18 litres/cow
Heifers: 15 litres/cow
Average concentrate: 7.7 kg/cow
Grass intake: 9 kg/cow/day

For further information on the GrassCheck suite of projects visit:

www.agrisearch.org/grasscheck

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