Tools for managing pasture

John Roche
Principal Scientist, Animal Science
Managing Director, Down to Earth Advice Ltd.
Room service for Stacey Hamilton
Objective: To grow and utilise as much pasture as possible
Pasture Utilised & Operating profit

\[ y = 289.9x + 36.92 \]

\[ R^2 = 0.60 \]
Grazing Residual and Herbage Intake

Cow Intake kg DM per cow vs Grazing residual kg DM per ha

- 400 kg cow
- 500 kg cow
Grazing Residual and Intake

10% increase in intake

50% increase in residual
“There is no greater force than the control of stocking rate in Grassland Farming”

-C.P. McMeekan (c1950)
Effect of Stocking Rate on Pasture Production, Milk Production, and Reproduction of Dairy Cows in Pasture-Based Systems

K. A. Macdonald, J. W. Penno, J. A. S. Lancaster, and J. R. Roche
DairyNZ (formerly Dexcel), Private Bag 3221, Hamilton, New Zealand

For every 0.5 cows/acre you grow an additional 1,100 lb DM/ac
Effect of Stocking Rate on Pasture Production, Milk Production, and Reproduction of Dairy Cows in Pasture-Based Systems

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For every 0.5 cows/acre you utilise an additional 2,300lb DM/ac

\[ y = 985.6x + 15749 \]
\[ R^2 = 0.64 \]

\[ y = 2073x + 7848 \]
\[ R^2 = 0.98 \]
Do you know

• Your adjusted acreage
• Your milking platform acreage
  – Optimum SR = 180 lb Lwt/ton total feed (pasture + supp)
    – 6 ton DM/ac, 1100 lb cow, 1,000 lb purchased supplement/ac
    – Optimum SR = 1.1 cows/ac

• Do you know what each paddock produces/yr
  – 100% difference between your best and worst paddock

If you don’t measure, you can’t manage
Managing pasture is as easy as 1, 2, 3
Energy allocation

Animals

- Maintenance
- Production
  - milk
  - growth
  - reproduction
- Body condition score
Energy allocation

Animals
• Maintenance
• Production
  - milk
  - growth
  - reproduction
• Body condition score

Plants
• Maintenance (respiration)
• Production
  - leaves
  - roots
  - tillers
• Storage
How pasture grows

Days post-grazing

Pasture yield, kg DM/ha
How pasture grows

![Graph showing pasture growth over days post-grazing]
How pasture grows

Delay grazing

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Pasture yield, kg DM/ha

Days post-grazing
Canopy closure
Canopy closure

When you can’t see the ground or pasture base directly below (usually > 2,500 lb DM/ac)

If > 25% of paddock is affected:
• Poor quality pasture
• Decline in tillering
• Post-grazing residuals will increase
What about Quality?

![Graph showing the relationship between NDF (%DM) and Number of leaves/tiller. The graph indicates that as the number of leaves per tiller increases, the NDF (%DM) also increases.]

NDF (%DM)

Number of leaves/tiller

0 1 2 3 4 5

0 10 20 30 40 50 60 70

[Logos: Down To Earth Advice Ltd and Dairy NZ]
The sweet spot – maximising pasture grown and quality
How tight should we graze?
How hard to graze

1.5 inches
How hard to graze

- 1.5 inches
- 3 inches
- 3 inches (following 2 to 3 rotations)
How hard to graze

- 0.75 inches (following 2 to 3 rotations)
- 0.75 inches
- 1.5 inches
- 3 inches
- 3 inches (following 2 to 3 rotations)
Phenotypic plasticity

2 inches residual

1 inch residual
The effect of grazing severity and fertiliser application during winter on herbage regrowth and quality of perennial ryegrass (Lolium perenne L.)

J. M. LeeÅ, D. J. Donaghy® and J. R. RocheÅ,Ç

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Down To Earth Advice Ltd

Dairy NZ
The effect of grazing severity and fertiliser application during winter on herbage regrowth and quality of perennial ryegrass (*Lolium perenne* L.)

J. M. Lee<sup>A,D</sup>, D. J. Donaghy<sup>B</sup> and J. R. Roche<sup>A,C</sup>
## Spring Grazing Trial Ruakura 1992

<table>
<thead>
<tr>
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<th>Ib DM/ac</th>
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<tr>
<td>Grazing Residual at Start of 52 day Grazing Interval</td>
<td>1773 1425 1155 864</td>
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<td>Cover after 52 day grazing Interval September</td>
<td>3264 3030 3000 2916</td>
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<tr>
<td><strong>Accumulated Growth</strong></td>
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<td>Kg DM/ha/day (52 days)</td>
<td>1491 1605 1845 2052</td>
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<tr>
<td><strong>Average growth rate</strong></td>
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<td>Kg DM/ha/day</td>
<td>28.7 30.9 35.5 39.0</td>
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</table>
How hard to graze pasture

- Ideal height is ~ 1.5 to 2.0 inches
  (equates to ~ 7 – 8 clicks on rising platemeter)
- Irrespective of (cool season) pasture species

NEED to get it right early!
What about the cows

Short Communication: Effect of Postgrazing Residual Pasture Height on Milk Production

J. M. Lee,* D. J. Donaghy,† and J. R. Roche*†
*DairyNZ Ltd., Private Bag 3221, Hamilton 3240, New Zealand
†Tasmanian Institute of Agricultural Research, University of Tasmania, PO Box 3523, Burnie, Tasmania 7320, Australia

- Set pastures up at 1.5, 2.0 and 2.5 inches
- Cows then grazed to previous height
- Milk yield not different at 1.5 or 2.0 inches
- Milk yield reduced at 2.5 inches
Impact of grazing Residues on Pasture ME

6 Canterbury Monitor Dairy farms 2003 season

Target residual 7 "clicks"
High residual 10 "clicks"
To summarise grazing management

- Graze when more than 2 leaves on >75% tillers
- Graze prior to canopy closure
  - Exception during late fall with dry cows
- Graze to 1.5 inches
  - Must begin as you intend to continue
Tools to enable efficient management

• Anything that allows you to estimate pre-grazing mass, leaf stage, and post-grazing height
  — Plate meter, C-Dax, “eye-ometer”

• Rotation planner/wedge
Spring Rotation Planner

Rotation Length

Point A

26th August graze 1/60th of the farm
= 2 ac/day for a 120 ac farm

Point B

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<th>Date</th>
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Rotation Length After Calving

- **Target Cover**
- **Low Cover, Fast Rotation**
- **Low Cover, Slow Rotation**

<table>
<thead>
<tr>
<th>Month</th>
<th>Target Cover</th>
<th>Low Cover, Fast Rotation</th>
<th>Low Cover, Slow Rotation</th>
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<td>1200</td>
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It requires flexibility and adaptation.
It requires flexibility and adaption

Feb 15th

Mar 31st

Apr 15th

Silage

Silage

Silage
Tools

- Plate meter, C-Dax, etc.
- Rotation planning, grazing wedges, etc.
- Your eyes and your brain
Phew. Thank God Willy John’s not here to graze