Nitrogen Use Efficiency.

MCDDG Group
Feb 2nd 2016
Peter Beale,
SLSO Pastures, Taree

Thanks too....

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- LLS Support
- Elders Scot Burley
- Josh Hack Dairy Australia
- Support Group – Yani, Neil, Richard etc
Issues

- Variation in N prior to sowing ryegrass
- Impact of kikuyu on ryegrass
  - Trash
  - N rate
  - Leaching on permeable soils
  - Soil moisture on growth
- Transition Issues
  - N rates
  - Insects

Further Issues

- How do we measure all that?
- Soil Tests
- Tissue Tests

Optical Senses: – Urine stains to Paddock?
Figure 3: Predicted total and monthly nitrogen (N) release from the soil organic matter in two soils differing in organic carbon (C) contents.

N availability related to C:N

Figure 1  Relationships between grass yield, nitrogen supply and summer rainfall in the subtropics and tropics of Queensland, Australia. (Unpublished and published data collated from 31 sites provided by the authors, D.A. Ivory, C.P. Miller, and R.T. Cowan)

Nitrogen Rate over kikuyu phase

Milk Income and Profit

Figure 2: Returns and Profit from Nitrogen applied over four harvests.
Two components Quantity & quality

Kikuyu Growth kg DM/ha

Low N – insufficient leaf growth by 4.5 leaf

<table>
<thead>
<tr>
<th>N Rate (Kg N/ha)</th>
<th>0</th>
<th>150</th>
<th>300</th>
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<td>9/1/2015</td>
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<td>8.1</td>
<td>8.5</td>
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<tr>
<td>2/2/2015</td>
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<tr>
<td>24/3/2015</td>
<td>8.2</td>
<td>9.1</td>
<td>9.0</td>
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<tr>
<td>Ave ME</td>
<td>8.0</td>
<td>8.4</td>
<td>8.7</td>
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### NDF Affects

<table>
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Nitrogen Uptake kg N/ha ( = leaf N% * DM)

![Nitrogen Uptake Graph](www.lls.nsw.gov.au/hunter)
Total Yield – Cuts 1 to 3 higher in high N

Ryegrass DryMatter kg DM/ha

0 150 300
0 150 300
0 150 300

Ryegrass Treatments

<table>
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<tr>
<th>Treatment</th>
<th>At Rye Sow</th>
<th>Veg Rye</th>
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<tr>
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<tr>
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<td>0</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
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</tbody>
</table>

Leaf Nitrate 1,2,3 harvests

Effect of Sowing N....
Trash or stubble management

- Spraying vs Mulching
  - Decomposition of stubble releases N
  - Reduced N demand from kikuyu

- Bulk left to decompose
- C:N ratio
- Leaching on permeable soils

Soil Moisture – N use and demand

- High rainfall - high growth – low N reserves
- Low Rainfall – low growth – excess N for Rye

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How to measure this

Urine Stains = Control

Ratio of Urine to Paddocks


Transition Issues

Concord 2 much better establishment.....


Late Concord held back kikuyu