Objective measurement and its influence on Dairy farm fertilizer use

Dairy Farms locations - courtesy of R Le Grange
Boyupup Dairy

- Present a quick snapshot of how we provide recommendations to 1 of 62 South West Dairy farm clients that we service.
Soil Types and Rainfall

- Majority of the our dairy farm clients have farm loamy sands and sandy loam soils but there are a myriad of soil types sometimes on the same farm

- Rainfall zones for Dairy clients – 700-1200mm
Soils of the Capel, Busselton and Augusta/Margaret River Shire
Courtesy of AgMaps (Ag Dept of WA)

Vasse Research Station
Consistent soil testing important

- Soil test every year to closely monitor chemical trends in the soil
- Soil test at near the same time every year (reduce temporal variation)
- Soil test along the same transect

Nutrient variability in paddocks
Soil testing

- Each paddock on Dairy farms tested at least every 3 years
- 30 cores are taken/test paddock and composited
- Primitive technology (pogo) is mainly used for sandy soils and drill for clay soils

Standard Pogo sampler
Soil Analysis

- Samples sent to a Australasian Soil and Plant Analysis Council accredited laboratory
- Turn around time is approximately 10 working days from arriving at the laboratory

Results presented to clients

- The results presented to clients take 3 forms

Firstly- A report which incorporates the soils tested into a computer model (subclover based)
Soil Report

<table>
<thead>
<tr>
<th>Name:</th>
<th>Fuel Gauges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>Fuel Code:</td>
</tr>
<tr>
<td>P.O. Box 123</td>
<td>12345678</td>
</tr>
<tr>
<td>Telephone:</td>
<td>Fax:</td>
</tr>
<tr>
<td>1234-5678</td>
<td>8765-4321</td>
</tr>
</tbody>
</table>

Central Enterprise Type: | Source: |
|------------------|------------------|

Sample Site: | 10 Acre |
|--------------|---------|

Remarks: Information from Agriculture Western Australia soils was used to derive these recommendations. Field trials have been used to ensure the recommendations are appropriate to the conditions on the farm. Nutrient management plans, including the recommendations, should be reviewed annually. The information provided is based on the soil test results. The recommendations are made on the basis that crop needs are met during the growing season. The team reserves the right to withdraw for the appropriate advice based on these recommendations.

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Fuel Gauges

<table>
<thead>
<tr>
<th>Parameter</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field A</td>
<td>20</td>
<td>22</td>
<td>23</td>
<td>24</td>
</tr>
<tr>
<td>Field B</td>
<td>21</td>
<td>23</td>
<td>24</td>
<td>25</td>
</tr>
</tbody>
</table>

Laboratory Analysis - Interpretation by Site

Nutrient Recommendations:

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
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<td>56</td>
<td>56</td>
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</tbody>
</table>

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Comments

Presentation of results

- Secondly-An Excel Spreadsheet indicating all the variables measured by the soil testing including Phosphorus and PBI
Excel Spreadsheet

© The State of Victoria, Department of Primary Industries, June 2007. Gourley et al 'Making better fertiliser decisions for grazed pastures in Australia'

![Excel Spreadsheet](image)

Figure 2: The relationship between percentage of maximum pasture yield and Olsen P soil test value from nationally collated experiments. The critical Olsen P soil test value at 95% of pasture production is indicated by the dashed line.
© The State of Victoria, Department of Primary Industries, June 2007. Gourley et al. ‘Making Better fertiliser decisions for grazed Pastures in Australia’

**Table 1:**

<table>
<thead>
<tr>
<th>PBI categories</th>
<th>Critical Coefficient of Phosphorus (PBI) Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>≤ 15</td>
</tr>
<tr>
<td>Very low</td>
<td>16-19</td>
</tr>
<tr>
<td>Low</td>
<td>19-24</td>
</tr>
<tr>
<td>Medium</td>
<td>25-29</td>
</tr>
<tr>
<td>High</td>
<td>30-39</td>
</tr>
<tr>
<td>Very high</td>
<td>≥ 40</td>
</tr>
</tbody>
</table>

*Note: Critical PBI values should be used as a guide to determine the likelihood of PBI deficiency. The values provided are approximate and should be used in conjunction with other soil test results to make informed decisions.*

*Source: Coelho and Potts (1990).*

**Figure:**

- **Colostom PBI test - pasture response relationship:**
  - The relationship between pasture growth and PBI values.
  - The critical Coefficient of PBI value is the soil test value required to produce 50% of maximum pasture yield.

- **Phosphorus-buffering index (PBI):**
  - The PBI value is calculated to determine the soil test value required to produce 50% of maximum pasture yield.

**Legend:**
- **PBI values:** Critical values are marked with a “*”.
- **Test results:** Values above the critical PBI values indicate a deficiency of phosphorus.

**Further Reading:**

**SPANA**

- **Product Image:**
  - Summit Fertilizers’ SPANA product, highlighting soil productivity and mycorrhizal assistance.

- **Icon:**
  - A symbol representing the product’s benefits for soil health and plant growth.

**Contact Information:**
- Summit Fertilizers
- [Website](summitfertilizers.com)
- [Customer Support](summitfertilizers.support)
Critical levels for P-calibrations

- New species
- Composition of pastures
- Grazing enterprises

Farm Maps

- The third representation of soil test results is by way of farm maps
- Preferred by many clients
Farm Maps

Phosphorus Levels
Soil pH (CaCl2)

Potassium (Colwell)
Trends over time

Tissue testing
Fertiliser Application Trends

- On Dairy farms, fertiliser is now applied to paddocks after the season break when pasture plants have established.

- Phosphorus applications are usually split depending on requirement of paddock.

Accuspread
Summit Advice - Summary

- Right Place - farm maps
- Right Rate - soil tests and tissue tests
- Right Time - weather forecasts and other risk assessments on farm