REFERENCES


GERTERBACH, W. 2006. Dairy farming in South Africa – where to now?


JONES, R.I. 2006. Fodder production planning for the dairy herd. Cedara Agricultural Development Institute available online


MACDONALD, C.I. 2006. Irrigation of pastures. Cedara Agricultural Development Institute available online


156


Appendix A1 Mean root biomass percentages of annual ryegrass for non N limiting well watered treatment
Appendix A2 Forage yield in relation to N concentration of annual ryegrass for data collected from a range of N application rates for eight growth cycles in 2007 (0, 30, 60 kg ha\(^{-1}\) cycle\(^{-1}\) for \(N_0\), \(N_{30}\), \(N_{60}\)) and seven growth cycles in 2008 (0, 20, 40 60 kg ha\(^{-1}\) cycle\(^{-1}\) for \(N_0\), \(N_{20}\), \(N_{40}\), \(N_{60}\)). Maximum \((N_{\text{max}})\), minimum \((N_{\text{min}})\) and critical \((N_c)\) forage N concentration developed using dilution curves of Marino et al. (2004).
**Appendix B1** Days after planting (DAP) and growing day degrees (GDD) after planting for growth cycles in 2007 and 2008

<table>
<thead>
<tr>
<th>Growth cycle</th>
<th>DAP</th>
<th>Cumulative GDD</th>
<th>Days cycle (^1)</th>
<th>GDD cycle (^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>63</td>
<td>64</td>
<td>780 735</td>
<td>63 64</td>
</tr>
<tr>
<td>2</td>
<td>98</td>
<td>99</td>
<td>1106 1023</td>
<td>35 35</td>
</tr>
<tr>
<td>3</td>
<td>128</td>
<td>135</td>
<td>1340 1333</td>
<td>30 36</td>
</tr>
<tr>
<td>4</td>
<td>155</td>
<td>164</td>
<td>1587 1645</td>
<td>27 29</td>
</tr>
<tr>
<td>5</td>
<td>182</td>
<td>190</td>
<td>1856 1943</td>
<td>27 26</td>
</tr>
<tr>
<td>6</td>
<td>205</td>
<td>213</td>
<td>2169 2235</td>
<td>23 23</td>
</tr>
<tr>
<td>7</td>
<td>232</td>
<td>236</td>
<td>2528 2555</td>
<td>27 23</td>
</tr>
<tr>
<td>8</td>
<td>259</td>
<td>-</td>
<td>2856 -</td>
<td>27 -</td>
</tr>
</tbody>
</table>
Appendix B2 Seasonal mean true protein (TP) and non-true protein (NTP) percentages of crude protein (CP) of annual ryegrass under a range of N application rates in 2007 (0, 30, 60 kg ha\(^{-1}\) cycle\(^{-1}\) for N\(_0\), N\(_{30}\), N\(_{60}\)) and 2008 (0, 20, 40 60 kg ha\(^{-1}\) cycle\(^{-1}\) for N\(_0\), N\(_{20}\), N\(_{40}\), N\(_{60}\))
Appendix B3  Acid detergent fibre (ADF) of annual ryegrass under a range of N application rates for eight growth cycles in 2007 (0, 30, 60 kg ha\(^{-1}\) cycle\(^{-1}\) for N\(_0\), N\(_{30}\), N\(_{60}\)) and seven growth cycles in 2008 (0, 20, 40 60 kg ha\(^{-1}\) cycle\(^{-1}\) for N\(_0\), N\(_{20}\), N\(_{40}\), N\(_{60}\))
Appendix B4 Metabolisable energy (ME) concentrations of annual ryegrass under a range of N application rates for eight growth cycles in 2007 (0, 30, 60 kg ha\(^{-1}\) cycle\(^{-1}\) for N\(_0\), N\(_{30}\), N\(_{60}\)) and seven growth cycles in 2008 (0, 20, 40 60 kg ha\(^{-1}\) cycle\(^{-1}\) for N\(_0\), N\(_{20}\), N\(_{40}\), N\(_{60}\))
Appendix B5  Crude protein vs forage yield of annual ryegrass under a range of N application rates for seven growth cycles in 2008 (0, 20, 40, 60 kg ha\(^{-1}\) cycle\(^{-1}\)). Vertical lines are maximum CP (22%)