



Advanced Sustainable Nutrient Management

Advanced Level Course Outline

Controller:	Fertilizer and Lime Research Centre (Massey University)
Availability:	Extramural study plus a three day contact course offered to groups (20-30 persons) as demand dictates
Location:	At Massey University, Palmerston North or at other venues by arrangement.
Delivery mode:	Four extramural written assignments plus a three day contact course.

Updated January 2016

Aim:	To provide students with an advanced knowledge of nutrient cycling pathways in New Zealand's farming systems, allowing them to develop solutions for systems that have unacceptable nutrient loss to the wider environment.
Entry requirements:	Participants must have a Massey University Certificate of Completion in Sustainable Nutrient Management in New Zealand Agriculture (Intermediate course). Applications for an exemption will be considered by the course controller.
Course requirement:	Participants must present four satisfactory assignments, attend all sessions of the three-day contact course and pass the two-hour examination on the final day.
Course prescription:	<p>An advanced knowledge of sustainable nutrient management is developed for common New Zealand pastoral and arable farming systems. A study guide and the Overseer[®] Nutrient Budgets software will assist participants to develop nutrient management plans for actual pastoral and arable farming enterprises. The aim is for each participant to produce sustainable nutrient management plans that meet production goals whilst minimising the negative effects of nutrient losses on the wider environment.</p> <p>During the contact course, workshop discussions and invited presentations will expose the participant to the latest in nutrient management research and policy, and solutions to mitigate nutrient loss from farming systems will be explored. Research and case study information will be used to examine the application of the Code of Practice for Nutrient Management.</p>
Learning outcomes:	On completion of the course the participant will be able to develop nutrient management plans for pastoral and arable farming systems that maximise the efficiency of nutrient use in the production system and minimise the loss of nutrients to the wider environment.
Assessment:	Four extramural assignments worth 8, 8, 8 and 16% respectively, plus a two-hour written examination at the end of the contact course worth 60% of course marks.
Requirements to successfully complete the paper:	Participants must present four satisfactory assignments, attend all sessions of the three-day contact course and pass the two-hour examination on the final day.

Learning Programme and Schedule:

Month One	Study guide mailed out.
Month One	Begin work on Dairy Farm Nutrient Budget Case Study.
Month Two/Three	Begin work on Arable Farm Nutrient Budget Case Study.
Month Three	Begin work on Nutrient Trading Assignment.
Month Four	Collect data towards nutrient budget on farm of your own choice. Bring electronic draft report to contact course.
Month Four/Five	Attend contact. Sit final examination.

Credit to other tertiary Qualifications:

The 'Certificate of Completion' is a recognised University achievement. A student may wish to have the work completed on this course (40 hrs private study, approximately 120 hours assignment preparation plus 20 hrs lectures and workshops) credited towards a postgraduate paper in Soil Science offered by Massey University. Further details can be solicited from Professor M J Hedley.

ADVANCED

SUSTAINABLE NUTRIENT MANAGEMENT

Contact course

PROVISIONAL PROGRAMME

Day One

Time	Major Topic	Contents Brief
8.30 - 8.45	Introduction	<ul style="list-style-type: none"> • Introductions • Course objectives
8.45 - 10.00	Case Study Workshop <i>Pastoral</i>	<ul style="list-style-type: none"> • Re-analysis of Assignment A <ul style="list-style-type: none"> ○ <i>Review of the case study</i> ○ <i>Implications of input information</i> ○ <i>Consideration of mitigation options</i>
10.30 - 12.00	The Hydrological Model	<ul style="list-style-type: none"> • Managing irrigation and other water issues in Overseer
1.00 – 2.00	Sustainable nutrient management in arable systems	<ul style="list-style-type: none"> • Key differences between the N cycle in arable and grazed pasture systems • Influence of soil tillage, crop management and crop residues on uptake of soil and fertiliser N • Factors influencing soil organic matter synthesis and decomposition
2.00 - 3.00	Case Study Workshop <i>Arable</i>	<ul style="list-style-type: none"> • Re-analysis of Assignment B <ul style="list-style-type: none"> ○ <i>Identifying problems and solutions</i>
3.30-4.30	Nutrient Trading	<ul style="list-style-type: none"> • Discussion of Assignment C <ul style="list-style-type: none"> ○ <i>Valuing and trading nitrogen</i> ○ <i>The Taupo experience</i>
4.30 – 5.30	Issues around effluent management	<ul style="list-style-type: none"> • Farm Dairy Effluent: System design and management

Day Two

8.30 - 10.00	Research and policy forum <i>[20 minute presentations plus time for discussion]</i>	<ul style="list-style-type: none"> • Selected policy and research topics <ul style="list-style-type: none"> ○ Canterbury Regional Council - Policy and Regulation ○ N leaching research (Dairy) - Mitigation options for proposed limits ○ N Leaching research (Arable) - Leaching loss relative to proposed limits
10.30 - 12.00	Continued.....	<ul style="list-style-type: none"> ○ Soil information for Overseer - Developments with mapping at appropriate scales ○ Denitrification mapping ○ Managing cows to reduce N leaching
1.00 - 4.00	Case Study Workshop Personal Farm <i>(concurrent sessions)</i>	<ul style="list-style-type: none"> • Assignment D: Personal Farm Individual presentations and discussion of solutions to case study problems <ul style="list-style-type: none"> ○ Presentation of report ○ Identifying problems and solutions

Day Three

8.30 – 9.30	Trace Elements	<ul style="list-style-type: none"> • Trace element issues in pastoral soils
9.30 - 10.30	The sustainable use of Trace Elements	<ul style="list-style-type: none"> • Diagnostic techniques for identifying trace element deficiencies and toxicities in farm animals
11.00 - 12.00	Review	<ul style="list-style-type: none"> • Free Time
12.45 - 3.00	Assessment	<ul style="list-style-type: none"> • 2 hour examination <ul style="list-style-type: none"> ○ Questions based on the course material including the course notes, the assignments and material presented on the contact course