



National Centre for Livestock and the Environment (NCLE) Glenlea Long Term Manure and Crop Management Field Trial

Purpose:

The long term manure management and cropping system trial is a field laboratory that will be used to optimize nutrient and energy cycling within integrated, environmentally and economically sustainable livestock and crop production systems.

General Approach

- Long-term replicated field trial at NCLE will be used to compare impacts of alternative types of manure and manure management on annual and mixed annual/perennial cropping systems.
- A multi-disciplinary approach will be used with participation of Plant Science, Animal Science, Soil Science, Food Science, and Microbiology.
- Soil conditions at the beginning of the trial will be determined as the base reference to help in comparing treatment effects
- Parameters of all facets of the production system and those from research findings to be stored in a data base for modeling efforts

Overall Description of Long Term Field Trial:

A minimum of 10 year duration is required for measuring treatment effects on nutrient and soil ecology dynamics for the two cropping systems (Annual, Perennial/Annual) of 5 year rotation sequence each (Table 1 and Figure 1). Within each main block of cropping system treatments, there will be twelve manure or nutrient management treatments (Table 2), including two treatments that will be reserved for types of manure that are currently unavailable at the research station (eg. solid vs. liquid effluent from a solid-liquid separator or anaerobic digester). The trial is expected to begin yielding soil nutrient and soil community ecology results within two full rotations (10 years). The overall value of this trial will continue to appreciate with time.

Table 1. Cropping System Treatments

Year	Cropping Systems	
	Annual	Perennial/Annual
Prep Year (2007)	Winter Wheat (straw removed for convenience)	
1 (2008)	Cereal (barley)	Cereal (barley) + underseeded forage
2 (2009)	Oilseed (canola)	Grass mix: Timothy, Orchardgrass, Tall Fescue, Smooth Brome
3 (2010)	Cereal (barley or feed wheat)	
4 (2011)	Oilseed (sunflower or flax)	
5 (2012)	Corn Silage	

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Table 2. Manure/Nutrient Management Treatments

Treatment	Nutrient Source	Rate of Application
1	Control (Check)	No nutrients applied
2	Synthetic fertilizer*	Crop N and P requirements based on soil test
3	Liquid pig manure (LPM)	Crop N requirements based on soil test
4	Solid pig manure (stockpiled)	"
5	Solid pig manure (composted)	This treatment is being developed
6	Solid dairy manure (stockpiled)	"
7	Liquid pig manure	Crop P removal for 3 years based on past yield**
8	Solid pig manure (stockpiled)	"
9	Solid pig manure (composted)	This treatment is being developed
10	Solid dairy manure (stockpiled)	"
11	Future development***	LPM based on crop N requirements
12	Future development***	LPM based on crop P removal

* synthetic fertilizer, with seed placed P will require 2 buffer plots, 1 on each side

** will require supplemental synthetic fertilizer N to "match" N rates in other treatments

*** these treatments can be changed at any later date (eg. solid-liquid separated manure)

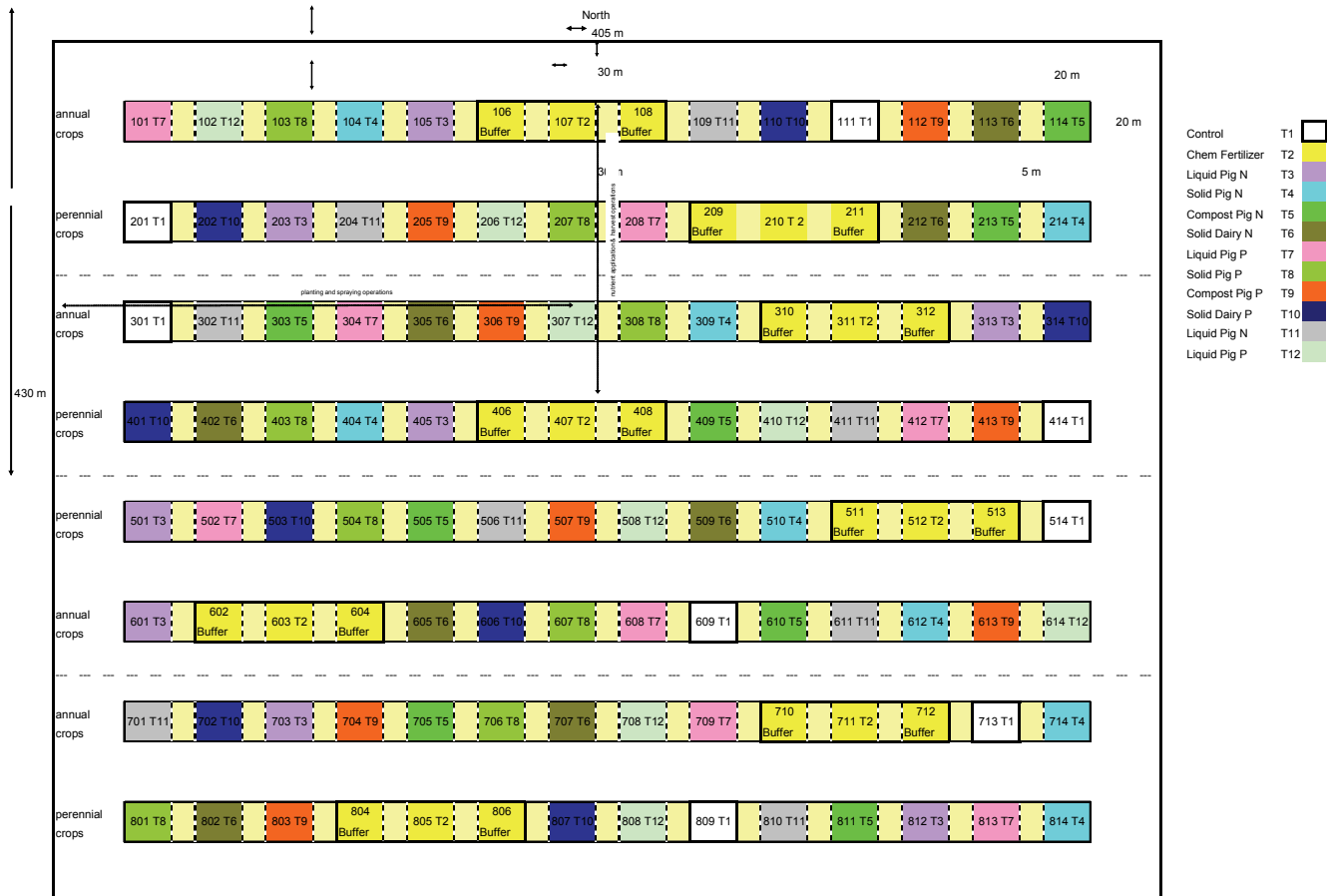


Figure 1. Layout for long term manure management and cropping system field trials.

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