

Pasture growth from poultry litter Part 2: Comparing the cost of poultry litter

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Background

Where poultry litter is available it provides a cheap but variable source of essential soil nutrients and organic matter. The nutrient and moisture content of poultry litter will vary depending mainly on the relative proportion of manure to bedding material. Nutrients will also vary due to changes in what is being fed, stocking rate of birds, time they are in the shed and the way the shed is managed.

An average nutrient analysis for poultry litter of 2.6% nitrogen (N), 1.8% phosphorus (P) and 1.0% potassium (K) is used for budgeting purposes based on previous surveys conducted by the author and others. Poultry litter used in the trial reported in part 1 mostly had average or higher nutrient levels.

Method

A trial described in part 1 of this paper was monitored from 2002 to 2008. All poultry litter and fertilisers applied were recorded and pasture production estimated using pasture cages. Trial

consisted of 3 treatments, 2 replications, plot size 15 m x 100 m, 3 cages per plot.

Treatment 1: Annual poultry litter received 15 m³/ha/year being spread in one application in December each year. First application December 2001.

Treatment 2: For the first 3 years received fertilisers applying the same nutrients as applied in treatment 1. These fertilisers were applied in split applications every 3 months. From year 4 to present this treatment has only received 100 kg/ha urea/month applied when the pasture was actively growing. In years 4 and 5 urea was applied in 7 months each year. In years 6 and 7 it was applied every month.

Treatment 3: Received poultry litter 15 m³/ha/year every 2nd year (4 times) in total. Also 100 kg/ha urea applied every 3 months except in years 1 and 3 when no urea was applied.

Control: A 20 metre nil fertiliser “buffer” was located at the bottom of each of the treatment 3 plots.

Table 1. Fertiliser costs

Treatment	Fertiliser applied	Cost	Total cost
1.	Poultry litter 15 m ³ /year x 7 years	\$20/m ³	\$2,100
2.	DAP 555 kg/ha x 3 years	\$1,080/t	
	Urea 142 kg/ha x 3 years	\$810/t	
	Muriate of Potash 124 kg/ha x 3 years	\$1,370/t	
	Urea 100 kg/ha/month x 7 months x 2 years	\$810/t	
	Urea 100 kg/ha/month x 12 months x 2 years	\$810/t	\$5,794.26
3.	Poultry litter 15 m ³ /year x 4 years (years 1, 3, 5, 6)	\$20/m ³	
	Urea 100 kg/ha 4 times per year in years 2, 4, 5, 6, 7	\$810/t	\$3,200

Note: Price of poultry litter is delivered and spread. Price of fertiliser is delivered only.

Table 2. Cost of pasture produced 2002 – 2008 (fertiliser cost only)

Treatment	Total pasture produced in 7 years – tonnes of dry matter/ha	Total cost of fertiliser \$/ha	Cost of pasture \$/tonne dry matter
1. Poultry litter only	108.826	\$2,100	\$19.30
2. Fertiliser only	121.093	\$5,794.26	\$47.85
3. Combination poultry litter plus nitrogen (urea)	120.850	\$3,200	\$26.48

Table 3. Cost of pasture produced in 2008 (fertiliser cost only)

Treatment	Total pasture produced tonnes of dry matter/ha	Total cost of fertiliser \$/ha	Cost of pasture \$/tonne dry matter
1. Poultry litter 15m ³ /ha	17.828	\$300	\$16.83
2. Urea 100 kg/ha/month	22.465	\$972	\$43.27
3. Urea 100 kg/ha every 3 rd month	19.698	\$324	\$16.45

Results

Cost of fertiliser

Fertiliser costs have varied widely during the time of the trial. Costs used are those available in the Lower Hunter in February 2009.

Over the 7 years the trial has been monitored, annual poultry litter cost a total of \$2100 or \$19.30/tDM produced, the fertiliser treatment produced the most dry matter but cost a total of \$5794 or \$47.85/tDM. The combination of poultry litter every second year plus urea every 3 months cost a total of \$3200 or \$26.48/tDM.

2008 was the highest production year so far with favourable weather and successful oversowing of ryegrass. The annual poultry litter treatment again produced over 17 tDM/ha costing \$16.83/tDM. The monthly urea produced 22.5 tDM/ha but this worked out at \$43.27/tDM at prices available in February 2009. 100 kg/ha urea every 3 months produced 19.7 tDM which worked out at \$16.45/t DM.

Discussion

Poultry litter applies a range of nutrients which are best used where a soil test indicates that all these nutrients, especially N, P, and K are required.

Monitoring pasture production on this high fertility site shows that poultry litter may be cost effective even when pasture response is only expected from nitrogen depending on the relative cost of poultry litter and other fertilisers.

In this situation we are concerned that excessive poultry litter will increase the risk of nutrients, especially phosphorus, in runoff and therefore recommend a combination of poultry litter once every 2 or 3 years (depending on soil test) and additional nitrogen fertiliser as required.

Further information

Griffiths, NW 2007 Best practice guidelines for using poultry litter on pastures, *Primefact*, NSW Department of Primary Industries.