



Information Sheet

7. NUTRITION

7.14 Use of poultry manure

Poultry manure is freely available within the sugar industry, particularly in the KwaZulu-Natal Midlands area ($\pm 100\ 000$ tons annually). Although applied regularly by some cane growers, its use has been limited because of its bulk and the relatively high cost of application. Presently, however, there is considerable grower interest in its use as an important source of nutrients in the farm fertiliser programme, and for its ameliorating effect on acid soils.

Composition of poultry manure

The nutrient content of poultry manure is highly variable and depends on various factors such as the feed given to the poultry, whether or not litter is used as bedding, moisture content, and age of the material. Two types of manure are commonly available.

Battery manure – from egg laying hens in cages which contain no litter. It is often wet, lumpy and somewhat more difficult to handle and spread than chicken litter. Left undisturbed it can undergo anaerobic fermentation, leading to loss of nitrogen as ammonia.

Details of the spreader can be obtained from the Extension Officer: Midlands North. Tel: 033-5011647 Fax: 033-5011743

Below is the average nutrient content on a dry matter basis of 25 samples analysed by FAS:

Nitrogen	: 2,5%	Calcium	: 6,0%
Phosphorus	: 1,5%	Magnesium	: 0,9%
Potassium	: 1,6%	Moisture	: 40%

Present value on a fresh weight basis is \pm R103 per ton.

Chicken litter – from broilers run on bedding material such as sawdust. This 'litter' absorbs the droppings, remaining reasonably dry with minimal loss of nutrients through fermentation, and is relatively easy to handle. Broilers are fed on a different diet to battery hens, as reflected in the average nutrient content of chicken litter based on 30 samples analysed.



A 'muck spreader' applying chicken litter to sugarcane in the KwaZulu-Natal Midlands.

Nitrogen : 3,3%	Calcium : 3,0%
Phosphorus : 1,6%	Magnesium : 0,7%
Potassium : 1,8%	Moisture : 20%

Present value on a fresh weight basis is ±R160 per ton.

Availability of nutrients

During the first year following application, about 80% and 65% of the total N and P respectively in **battery manure** will become available to the crop. Comparable figures for **chicken litter** are 60% N and 45% P. However, within three years of application the residual N and P from both types of manure should become available to the crop.

Over three years based on average nutrient and moisture content:

5 tons of **battery manure** per hectare would provide 75 kg N, 45 kg P, 48 kg K and 180 kg Ca

5 tons of **chicken litter** per hectare would provide 132 kg N, 64 kg P, 72 kg K and 120 kg Ca.

Application rates

In general, 5 to 8 tons of **battery manure** or **chicken litter** per hectare **applied to the planting furrow** will provide adequate amounts of N and P on most soils, but K may be inadequate. If the manure is broadcast and incorporated before planting, then about twice the in-furrow rate will be required. Care should be taken to cover the poultry manure with soil before planting seedcane because of its high N content, which may 'burn' the buds if placed in direct contact with the manure.

Note: Because of the variable nutrient content of poultry manure, **it may be necessary to balance the crop nutrient requirement with inorganic fertilisers.** For this reason it is **strongly recommended** that representative samples of the manure are submitted timeously in sealed containers to the Fertiliser Advisory Service for analysis in order to obtain detailed advice on optimum application rates.

Other characteristics of poultry manure

Amelioration of soil acidity

Poultry manures also supply significant amounts of calcium (25-35 kg Ca per ton) which with continual application help to reduce acid saturation,

particularly in Midlands soils.

Micro-nutrients

Poultry manure is generally well supplied with micro-nutrients:

Boron ±40 ppm, Copper ±20 ppm, Iron ±1 000 ppm, Manganese ±300 ppm, Molybdenum ±4 ppm, Zinc ±200 ppm.

It is unlikely therefore that trace element imbalance will occur following continuous use of poultry manure. As a precaution, however, soil pH and nutrient levels should be checked periodically by FAS.

Effect on sucrose % cane

Sucrose % cane may be lowered quite substantially by the application of poultry manure. This is because of its high N content and the fact that N is released gradually, which may delay the ripening of cane. When using poultry manure the rate of applied inorganic N fertiliser **must be reduced** in category 1 and 2 soils, which have a low to medium N mineralising potential. In category 3 and 4 soils which mineralise substantial amounts of N, particularly in the Midlands, additional inorganic N fertiliser will seldom be required.

Effect on Eldana population

Because of its high N content, excessive amounts of poultry manure should not be applied, particularly to category 3 and 4 soils in the Midlands which mineralise large amounts of N, as this will favour an increase in the Eldana population.

Residual effects

Following regular broadcast applications of poultry manure to ratoon cane crops (8 tons per hectare), and the continual release of N and P from this material, substantial residual effects on yield can be expected. In time this should enable the grower to reduce the application rate without loss of yield. Soil sampling of ratoons at regular intervals will allow the FAS to adjust fertiliser advice accordingly.

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