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Earthcare
TECHNICAL



Green Compost use in Agriculture

Green Compost Information Sheet for Farmers

A factsheet produced by Earthcare Technical Scotland, December 2010.

1 What is Green Compost and why should I use it?

Green compost is a natural product made by mixing, stacking and turning biodegradable materials under managed conditions. The compost sold by Keenan Recycling Ltd has been made wholly from plant materials recycled from parks, gardens and households. This compost has been processed under controlled conditions to produce a high quality product, as defined by the British Standards Institution's Publicly Available Specification 100 (BSI PAS100).

2 Potential benefits of using compost

Organic matter in soil is essential for good soil structure, water holding properties, microbial activity and soil health. Green composts are excellent soil conditioners, which can be used to add organic matter to soils and to increase production through a range of benefits as follows:

- Reduced need for bagged fertiliser.
- Reduced nutrient leaching.
- Increased yielding potential.
- Potential to improve drainage in heavier soils.
- Improved water-holding in light soils.
- Reduced erosion risk.
- Better soil structure leading to:
 - Greater workability of the soil.
 - Increased traffic tolerance.
- Beneficial soil micro-organisms aid:
 - Soil aggregation.
 - Nutrient recycling.
 - Plant disease suppression.

In addition to providing valuable organic matter to soils, composts act as slow release fertilisers for N and P and provide a readily available source of K. Other nutrients, including Mg, S and trace elements are also provided. The efficiency of inorganic N fertiliser use by plants has been shown to be improved following compost application, due to better overall nutrient supply and improved rooting environment. Compost can also provide a useful source of calcium and has a useful liming effect. It has up to 15% of the neutralising value of lime on a dry matter basis, but since it tends to be applied at much higher rates than lime, the liming effect of a single compost application can be more than that of a typical application of lime.

3 Green Compost produced by Keenan Recycling Ltd

The composition of Keenan Recycling green compost will vary slightly, but as a general rule, it has the following characteristics:

Keenan Recycling Green Compost - typical values for important compost properties				
Compost parameter	Reported in fresh compost as (units of measure)	Typical value	Total nutrients/tonne moist compost	
			Kg	Units
pH	pH units (1:5 water extract)	7.6		
Moisture content	%	39		
Organic matter content	% in dry matter	12		
Screen aperture size	mm	40		
C:N ratio	ratio (between % C and % N in dry matter)	13.1		
Electrical conductivity	µS/cm @ 20°C	1076		
Total N	mg/l	5193	8.7	17.4
Total P	mg/l	855	3.1 (as P₂O₅)	6.2 (as P₂O₅)
Total K	mg/l	3132	6.0 (as K₂O)	12.0 (as K₂O)
Total Mg	mg/l	1033	1.7 (as Mg)	3.4 (as Mg)
Total S	mg/l	582	0.9 (as S)	1.8 (as S)

Typical application of 28 tonnes of compost/ha (11 tonnes/acre) will provide approximately:

Nutrients	Total amount (kg/ha)	Total amount (units/acre)	Available year 1 (kg/ha)	Available year 2 (kg/ha)
Nitrogen as N	244	195	~ 0%	0 - 5%
Phosphate as P ₂ O ₅	87	69	50%	
Potassium as K ₂ O	168	134	80%	
Magnesium as Mg	48	38	20%	
Sulphur as S	25	20	10%	

Keenan Recycling green compost also contains small amounts of trace elements that are essential to plant growth. It typically contains very low levels of potentially toxic elements. The compost has been tested for human pathogens. It was found to contain no *Salmonella* species and was well within the safe limit for *E. coli* according to the tests required under the British Standards Institution's Publicly Available Specification 100 (BSI PAS100). Tests also showed that there was no contamination with weed seeds, and plants grew well in the growing trials specified under the standard. The compost is stable and mature and it typically contains negligible contamination in the form of plastic, metals and glass.

4 How to use green compost

The total N in compost should be applied according to crop needs in conjunction with bagged fertiliser. The needs of the soil for the full crop rotation should be considered when assessing other major nutrients. Regulations relating to codes of good agricultural practice should be followed (e.g. NVZ regulations, PEPFAA and the Farm Soils Plan). NVZ regulations and Waste Management Licensing allow a maximum of 250 kg/ha N to be applied from the compost in any 12 month period over the farm as a whole.

Compost is most easily applied using a spreader with a moving floor and rear discharge. In order to maximise its effects on soil structure, it should be mixed into the soil and not simply inverted into a buried layer by the plough.

Unlike animal manures and bagged nitrogen fertilisers, which are high in available N, green compost N is slow release. It is therefore safe to apply it in the autumn without the risk of significant leaching. Since green compost N is slow release, it is generally best to assume that none of the N present in green compost is available to crops in the year of application. However, the N present in compost will be released slowly over time, and where compost has been applied regularly over a number of years, it may become possible to reduce bagged fertiliser N applications, particularly where malting barley is being grown. Surface applications of compost to grass immediately after the first cut of silage can be

particularly beneficial due to its K and S content, coupled with its slow N release rate. Compost should be applied when grass is actively growing and nutrient demand is high. Although there is no regulatory grazing restriction for Green Compost, grass should not be grazed for 3 weeks after application to allow grass to grow through the compost.

5 Cost benefits

The direct inorganic fertiliser replacement value of compost is **up to £9 per tonne** of compost depending on fertiliser prices and compost nutrient content. Additional value comes from improving soil health, soil trace element content and organic matter levels. Diminishing world supplies of rock phosphate for fertiliser production are likely to significantly increase the value of the phosphate present in compost in future years. Compost applications can improve the health and quality of soils and the value of land in the longer term. Organic matter greatly improves the quality of many types of soils and thereby improves its ability to support the production of good yields of healthy crops. Improved soil quality can lead to savings in fuel during cultivations, reduce the frequency of irrigations, saving labour and water and can allow machinery on to land on more days in the year without damaging soil structure. These benefits are difficult to quantify, but farmers do tend to notice them when compost has been applied. Spreading costs are generally about £1 - 3 per tonne depending whether farm machinery is used or contractors employed.

Distance from the composting site is a significant factor in the cost of compost and the high cost of transporting compost means that farms close to the composting site will find it easier to justify the cost of using it.

It makes sense to use compost on both soils and crops, which are likely to show the greatest response.