

Biosolids are a valuable organic fertiliser and soil conditioner that supply major and micro nutrients to promote crop health.

Application Rates

The application rate of biosolids to land needs to be done with caution. The predicted nitrogen requirements of the crop to be grown are not to be exceeded over a 3 year period, nor the maximum allowable soil contaminant concentrations as listed in *The Tasmanian Biosolids Reuse Guidelines (1999)*. Prior to applying biosolids, undertake soil analysis of nutrients, pH and heavy metal levels on all paddocks. All biosolids used on agricultural land also need to be analysed for nutrients and key metal and organic contaminants. If the biosolids are graded as Class 2 due to contaminant concentration or grade of stabilization, then the application rate per three year period is to be less than 50% of the Nitrogen Limited Application Rate or less than 50 wet tonnes per hectare (whichever is the lesser).

Nitrogen

The available nitrogen content of biosolids is dependent on the treatment processes used. Research in Tasmania suggests that an application rate of 23 wet t/ha of biosolids (4.2% total N DMB) supplies about 50 kg/ha of available nitrogen in the first year after application, which is sufficient for growing cereal crops. Nitrogen available in subsequent years is likely to be of the order of 10 and 2 kg/ha in the second and third years after application. Autumn applications of biosolids to fallow cropping land should be avoided, as nitrogen losses can be high due to leaching during winter.

Phosphorus

Biosolids can supply the phosphorus requirements for grass and cereal crops. Crops such as potatoes will require additional fertiliser depending on the phosphorus status of the soil. Monitoring of the total phosphorus and the phosphorus adsorption capacity of regularly used sites at five yearly intervals

will identify if action is required to avoid phosphorus overloading.



Spreading of biosolids using purpose built spreader

Potassium

All biosolids are low in potassium and farmers should apply the standard recommended rates using mineral fertilisers.

Sulfur

Beneficial amounts of sulfur are available for crop growth with an application rate of 23 wet t/ha of biosolids supplying an equivalent of 10 kg/ha of available sulfur in the year after application.

Lime

Lime amended biosolids is an alternative to agricultural lime. Lime amended biosolids is to be applied at a rate which will raise the soil pH enough to ensure satisfactory crop growth rather than an application rate based on nitrogen content. Research in Tasmania has found that application of 23 wet t/ha of lime amended biosolids to the surface of a sandy loam soil resulted in an increase in soil pH of 0.5 units and that when the biosolids were mixed into the upper 10cm of soil the pH increased by 0.9 units. Changes in pH are likely to be less on clay textured soils but greater on sands. The beneficial effect on soil pH can last for 5 years or more, depending on rates of soil acidification.

Addition of biosolids that has not been treated with lime results in no measurable difference in soil pH.

Soil sodicity

The use of lime amended biosolids can be beneficial for the treatment of soil sodicity if the biosolids are cultivated into the soil. The calcium added in the biosolids displaces sodium resulting in less soil dispersion and more stable soil structure.

Organic Matter

Regular additions of biosolids will slowly increase soil organic matter levels. Research in Tasmania has shown short term benefits to soil water holding capacity.

Micro-nutrients

The source (urban or industrial) can mean that biosolids contain variable contents of micro-nutrients. Small beneficial amounts of boron, copper, molybdenum, selenium and zinc can be present in biosolids. However, trace amounts of the toxic metals arsenic, cadmium, chromium, lead, manganese, nickel and mercury may also be present depending on their source. The concentration of metal contaminants in the soil determines the rate of application (refer to the Guidelines). The amount of metals removed by most agricultural crops is very small and care needs to be taken to prevent inappropriate application of biosolids containing elevated levels of metals.

Guidelines are available at:
<http://www.environment.tas.gov.au>



Loading biosolids for on-farm spreading.

Produced with funding from:



Australian Government

Department of Agriculture, Fisheries and Forestry
 National Landcare Programme



tiar
TASMANIAN INSTITUTE OF AGRICULTURAL RESEARCH

