

The Role of Biosolids in Agriculture

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Biosolids, or sewage sludge, is the solid material remaining after sewage treatment. Since 1989, the Sydney Water Board has been using increasing quantities of this resource, once considered a waste, as a fertilizer and soil conditioner in agricultural land application programmes. Biosolids contain over 60% organic matter and contain the essential plant nutrients, nitrogen and phosphorus, in addition to minor concentrations of other plant nutrients including potassium and magnesium.

A range of biosolids products can be used in agriculture:

- Liquid biosolids - a liquid product (6-12% solids) which requires soil injection.
- Dewatered biosolids - a centrifuged and/or pressed product which raises the solids content to 20% or greater, producing a spreadable product of manure consistency. The levels of nitrogen and phosphorus vary between 3-6% and 1.5-4% respectively, depending upon the source of the biosolids.
- Lime-amended biosolids - dewatered and mixed with quicklime to produce a slightly drier product suitable for acid soils. The levels of nitrogen in the lime amended products are significantly reduced due to the volatilization of nitrogen in the form of ammonia upon lime addition.
- N-Viro Soil - dewatered and mixed with an alkaline admixture of lime and cement kiln dust, also suitable for acid soils.
- Pellets - biosolids dried to approximately 95% solids (commencing mid-late 1994)

Approximately 30% of Sydney's biosolids are currently being applied to agricultural land. In 1993, this represented application over approximately 600 hectares on 21 farms. This figure is expected to increase considerably in 1994. Biosolids have been used for both cropping and pasture renovation. In 1993 they were applied to 374 hectares of land as part of a pasture renovation programme, whilst 226 hectares were sown to crops, including oats, lucerne, millet, lupins, triticale, wheat, field peas and canola.

In 1989, 10 farms were introduced to the land application programme. Initially, these farms were located in and around the Sydney basin. In 1994, however, 30 farms are in the programme and are located in the southern highlands, southern tablelands and central west slopes and plains districts.

Agricultural applications are carried out in accordance with NSW Agriculture's Guidelines for the Use of Sewage Sludge on Agricultural Land. Liquid biosolids are applied with a liquid injection vehicle designed for the purpose. They are injected about 10 centimetres below the ground surface via a modified agroprow mounted at the rear of the machinery. Dewatered biosolids are typically applied at rates of 40-50 wet tonnes (approx. 10 dry tonnes) per hectare using a tractor-drawn, rear or side discharge manure spreader. The spreading is subsequently followed by incorporation with a disc plough.

The Water Board is providing funding for NSW Agriculture to carry out a comprehensive research program on the use of biosolids. At present, there are over 20 state-wide trials examining the fertiliser value and sustainability of biosolids in agriculture. This in turn

will further develop the regulatory framework surrounding biosolids applications.

The demand for biosolids in agriculture is increasing. In the environmentally conscious 90's, there continues to be a growing awareness and acceptance

regarding land application of biosolids. The partial replacement of artificially produced chemical fertilisers with organic substances such as manures and biosolids, is consistent with a possible trend away from inorganic fertilizers in the agricultural sector.
