

Sustainable Recycled Organics Usage



ON-FARM FACTSHEET SERIES

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LAND APPLICATION – Benefits of recycled organics to soil health

Applying recycled organics (manure and compost) to soil can improve soil health in a variety of ways by improving soil structure and biology.

Measuring soil health can be difficult, and estimates are usually based on soil organic matter levels or microbial carbon levels (the amount of carbon in live microbial bodies). Generally speaking, more organic matter in a soil means better the soil health.

Recycled organics improve soil health directly (through the addition of carbon and nutrients that feed soil micro-organisms) and indirectly through improved plant growth which can lead to higher amounts of organic matter being added to the soil. Both these pathways affect the different aspects of soil health.

Influence on soil biology

Research and farmer knowledge suggest that soil biology is important for soil health. It is now more widely recognised that plants need more than nutrients for maximum growth. Soil biology, or soil life, refers to microbes (such as bacteria and fungi) and soil fauna (protozoa and invertebrates such as mites and earth worms). This is the living portion of soil organic matter and is responsible for improving soil structure and cycling nutrients. There are not many good tests available for soil biological activity, however the amount of microbial carbon in a soil will give some indication of this. Improving soil biological activity is mainly done by adding suitable 'food' to the system, particularly in the form of available carbon and nitrogen.

Adding a recycled organic to soil instantly adds a food source for the soil life. The added nutrients in recycled organics will promote higher plant growth which may increase organic matter inputs to the soil. This will further improve soil health.

In this way inorganic fertilisers can also improve soil health by increasing organic matter inputs to the soil system, provided the organic matter is not removed by burning, hay making or other means.

Improved soil structure

Adding recycled organics to the soil in adequate amounts (> 5 t / ha) can improve soil structure by decreasing bulk density, increasing permeability,

increasing the cation exchange capacity (CEC) and increasing aggregate stability. Adding recycled organics can also lead to lower soil shear strength which improves plant growth and friability.

These changes lead to higher infiltration and moisture retention in soil, better nutrient retention and better plant growth. These benefits can occur quite rapidly after one or two applications but they may not persist if usage declines.

Improved nutrient cycling

Applying recycled organics to the soil can improve the ability of the soil to cycle nutrients. This is because the changes in nutrient form within soil are brought about by microbial activity and enzymes produced by microbes. Recycled organics supply nutrients to the soil which increase the supply available for microbial activity. This cycle of nutrients in organic matter supplies a large amount of nutrient for plant growth and production. The microbial population will also cycle nutrients from inorganic sources and soil minerals. Organic matter also improves the soil CEC which improves the ability of the soil to hold nutrients and prevent leaching losses, keeping more nutrients in the system.

The benefits of using recycled organics are weighed up by only a few negatives. Soil structure can be damaged during the application of recycled organics by compaction, and recycled organics can add other contaminants (salts and heavy metals) which may inhibit soil health. These risks can be minimised by good management practices. For further information see the fact sheets 'Management – metals' and 'Management – Salts' in this series.

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