



Benefits of Using Animal Manures and Composts

BACKGROUND

Animal manures and composts (made from animal manure) have many benefits for soils in agriculture. They provide nutrients, act as soil conditioners, improve soil physical properties, encourage more microbial activity which ultimately creates a healthy system. Manures commonly used to improve soil health include; cattle manure from feedlots and dairies, chicken manure and pig manure. Composts can consist of a range of materials, often including manure, along with; council green waste, urban waste, wood chip, saw mill dust, agricultural waste (e.g. citrus waste), rock mineral (e.g. basalt) and calcium silicate.



A compost windrow at Mundubbera, Queensland.

BENEFITS

The level of benefit to the soil from applying manures and compost will depend on a range of factors including;

- the **quality** of the product added
- the **quantity** of product added, and
- the **number of reapplications** needed.

Some benefits may take years to occur so results shouldn't be expected straight away.

Chemical & Nutrient Benefits

Manures and composts will provide nutrients but usually at a slower rate than conventional (synthetic & inorganic) fertiliser. Typically, conventional fertilisers are applied in a single application to the entire crop. This is undesirable as plant growth requires nutrients over time and not all at once. The slow release of nutrients from manure and composts will synchronise with plant demands for nutrients over time. The availability of nutrients in the manure or compost product will depend on the quality of the material used. Regular testing, using an appropriate soil laboratory analysis, is the key to balancing nutrient needs in the soil and selecting the right materials to use. It is also important not to rely solely on manures or composts and use other sources of nutrients (e.g. conventional fertiliser) to make sure all the plant's needs are met. Manures and composts can enhance the performance of synthetic fertilisers, reducing the quantity



needed but not necessarily replacing them entirely. Otherwise, this could lead to disaster where soils are deprived, and plants underperform. All paddocks need to be regularly soil tested to stay familiar with the soils nutrient status.

Physical Benefits

Physical improvements to the soil from manure and compost use happen over time and can include improved soil structure, improved water infiltration (and decreased erosion) and improved moisture retention.



Compost material in the breakdown process.

Organic Matter Benefits

Long-term application of conventional fertilisers can lead to degeneration of organic matter and microbial activity in soils. Compost and manures add carbon based (organic) material back into the soil, which is beneficial for soils that have been depleted of organic material. Having microbial activity in the soil enhances soil aggregate formation and strength, soil respiration, nutrient cycling and enzyme activity.

Environmental Benefits and Risks

Manures and composts provide a slower release of nutrients (compared to inorganic conventional fertiliser) and are likely to be in a safer form. Nutrients are less likely to be lost through leaching and denitrification and the availability can match better with plant

demand. Manures and composts improve soil infiltration resulting in decreased runoff and erosion risk. These healthier, more productive soils can also reduce soil pathogen levels leading to reduced disease incidence throughout crops and pastures.

Despite these benefits, manure and compost use can generate some environmental risks to air and waterways that producers need to be aware of. These practises can release gases such as ammonia, nitrous oxide and methane which can be harmful to human health and the atmosphere. Nutrients can also be lost via leaching in drainage water then into waterways. Measures should be taken to prepare sites and handle the materials to contain these risks.

Economic Benefits

Manures and composts can be cost-effective when compared to conventional fertilisers. However, the cost for farmers will depend on the availability of the product when needed, the proximity of the product to farm (freight costs) and quality of product against the needs of their pasture/farm operation. The improvements in soil structure and fertility can increase the yield of a crop or pasture, or decrease the input costs, resulting in a greater profit.



Simple results showing a strip applied with a poultry-based compost and a strip with none applied.