Humus

Good quality compost in sufficient quantities is essential to the organic grower. When all the relevant materials have broken down and been transformed through the composting process, the resulting material is dark, spongy and sweet smelling, similar to the topsoil of the forest floor.

This material consists largely of humus; a complex product that to date is still not fully understood, nor has it yet been thoroughly chemically analysed - it is too complicated a combination of chemical compounds and microorganisms. Humus is the most active and important constituent of soils, and essential for strong, healthy and sustainable plant growth.

- Humus contains a vast spectrum of nutrients, held in compounds that plant roots can feed from as required. (Unlike chemical fertilisers, which are quick-release, easily leached out and do not contribute to soil structure.)
- As well as the main (i.e. macro-) nutrients such as nitrogen, humus contains various micronutrients; minor but nevertheless essential elements for healthy plant growth. Studies have proved so far that up to 60 of all known elements are required by plants. However, if such elements are "free-floating" and so not bonded with humus compounds, they can be either unavailable to the plant, or even toxic (e.g. copper).
- The spongy structure of humus means can hold more than its own weight of water. In the event of drought, a plant is able to draw on special reserves of water that humus compounds hold on to by way of electrical charge.
- A humus rich soil helps prevent erosion (wind and rain) by virtue of its crumb structure. Compare 4000 years intensive farming in China with USA agriculture in last 80 years.
- Many of the processes in the soil that aid plant growth are oxidative; sufficient quantities of humus rich compost present in the soil ensures plenty of air spaces and helps prevent panning and capping of the soil.
- Additionally, a well-aerated soil helps the formation of mycorrhizal hyphae. These fungi form symbiotic relationships with plant roots; feeding the plant valuable nutrients and are especially valuable as a survival mechanism for times of environmental stress.
- Humus can help overcome extreme soil pH levels. Plants are less dependent on having just the right soil pH if humus levels are significantly increased.
- Humus enriched soils provide good food for earth worms, who help aerate and fertilise the soil, as well as balancing soil pH.
- Of particular interest to urban farmers/food growers is the ability of humus to neutralise or lock up soil toxins such as heavy metals.

Many of these elements, however, are required in small doses by plants; the humus compounds render these elements insoluble except for the small amounts that may be required by a crop.