

MIDWEST BIO-SYSTEMS' NEWSLETTER

March 2004

Subject: Humus

What it is:

- Humus is derived from concentrated high energy compounds of humin, fulvic, and humic acids

Where it comes from:

- It is the by-product of organic matter passing through the digestive systems of certain beneficial microbes in an aerobic environment
- Humification is a 4-generation process of "progressive dependency"—each generation of microbes needs to function successfully for the succeeding generation to achieve its intended benefit

What it does for the soil and growing plants:

- Helps create a balanced growing environment for the plant—physical, biological, and chemical
- Complexes inorganic nutrients in a plant-available form—when mineral nutrients are mixed with compost, they combine chemically with the humic acids, forming solubilized (plant available) compounds
- Buffers the minerals so they are available when needed by the growing plant
- Sequesters undesirable salts so plant growth is not impeded
- Buffers the minerals across a wide pH range
- Expands clay colloids in the soil creating a porous structure, allowing oxygen to penetrate
- Holds 4 times its weight in water, therefore improving the soil's water management capacity by reducing run-off, evaporation, and mineral leaching
- Adds beneficial microbes and provides an environment allowing many different species to function efficiently in the same environment.

Consequences of limited humus formation:

- *Physical Aspect*—Compacted soils cause poor water management capacity, deficient soil aggregation, and limited air movement
- *Chemical Nutrient Aspect*—Tied-up nutrients which are therefore unavailable to the plant, mineral nutrients react with each other forming compounds the plant cannot use, and salts not integral to plant growth impede and limit growth
- *Biological Aspect*—provides neither a microbial food source nor an environment for beneficial microbes to thrive, multiply, and perform their useful functions in the soil

How it is measured:

- Laboratory and microscope analysis using upgraded weighting value analysis with 23 factors of information
- Potential pH test differential—determines exchange capacity, biological activity, and degree of humification; this is a comparison of the actual pH with the potential pH; when pH readings are further apart, it indicates poor humification; when pH readings are close, it indicates a high degree of microbial activity, humus structure, and surface area; ideal ranges are less than 0.5 for soil and 0.3 for compost

Increasing humus in the soil:

- Apply nutrients to balance the soil in combination with humic acid (either in the liquid or compost form)
- Microbial inoculants can supplement deficient species
- Improve the microbial environment for beneficial species to flourish
- Cover cropping

What Midwest Bio-Systems can do to aid you in insuring adequate humus formation in your field:

- **Compost and soil fertility education**—you are invited to attend the Compost Workshop in Princeton, Illinois, beginning at 6:00 p.m. on March 31st continuing until 4:00 on April 2nd. To receive a brochure or register, call 800-689-0714 or email mbscustomerservice@emypeople.net
- Utilize the enhanced Midwest Bio-Systems **inoculation** products and processes.
- Take advantage of **MBS' compost tea products and blends** to boost this year's crop and soil.
- Cultivate your own high quality, humus-producing compost by utilizing **MBS' Advanced Composting System and the Aeromaster line of compost turning equipment**. Turn your available organic waste products into a soil-building asset.