COMPOSTING

PREAMBLE

Composting comprises all the complex biological reactions which make up the decomposition of the organic material in aerobic conditions (viz., living microorganisms coming into contact with the air).

The ideal components to make up compost can be of - animal origin, (solid and liquid defecation, leftovers from the butchery, tannery, fishing industries etc.), - vegetable origin, (dry sticks, grass cuts, dried vine fruits, wine residue, algae, olive press residue, vegetable water, market vegetable and fruit leftovers, remains from distilleries, bottling plants, etc.) - mixed in origin, (urban waste, remains from food industries, etc).

During the decomposing process, the injected micro-organisms alter, following the appropriate reactions, the organic substances, and in so doing, transform unstable substances within the more stable composts which contain a slow energy release, (humus substances), to a very high energy content ready-for-use (proteins, sugars, cellulose, fats).

The above-mentioned components, appropriately bio-elaborated, supply organic humus substance which returns to the soils, a significant amount of the organic quantity which mineralizes every year.

TECHNIQUE

The processes in bio - transformation occur in lesser time when the components are placed in heaps.

To prepare these heaps one must aim to aid the physical/chemical, and enzymatic/micro-biological processes which change the mass into a homogenous material rich in fertilizing value.

To reach this objective within reasonable time, (3 to 4 months), it is vital to utilize an injection which contains selected enzymes and bacteria; and for this purpose, BEA, has launched a specific product with the commercial name of BIOZIMOSTART, which specifically spear-heads the process at hand.

The necessary procedure is as follows:

One must come up with an equilibrium between the geometric size of the granules which make up the heaps, needing to be adequately minute, so as to develop a large contact surface, (for the purpose of enzyme/bacteria attack), as well as being quite large to allow air circulation (oxygen is basic to maintain the high speed of bio - transformation).

The heaps require a height that avoids compression, and in any case it is wise to avoid going over a height of 2.5 meters, with a base of 3 to 4 meters, and a length at will.

For the first 30 days of fermentation, the bio- mass of the heaps must have a **humidity between 60 and 75%,** and a ratio of 25 to 30 for carbon/nitrogen; the carbon needs to be present in the form of sugars, starch, cellulose, lignin, with a ratio that is balanced to avoid nitrogen losses and to obtain a well fermented final product, which is crumbly, slow in mineralization with a high fertilizing potential forma.

The temperature, during the first 15 to 20 days, at the center of the heap must not go below 55 degrees C; otherwise it is imperative to control if there is sufficient aeration, whether the nitrogen and carbon available fall within the ratio indicated and whether the humidity is excessive or insufficient.

Throughout the time taken to prepare the heap there must be no escape of the ammonia odor; in which case there is more nitrogen with respect to carbon, or carbon is not available;

The pH needs to be controlled periodically and maintained between 6.5 and 7.5

The composition of the heap must be as homogenous as is possible, in order to avoid injected bacteria deforming the activity,(viz., in certain points there could be an excess of proteins which then in turn develop an excess of proteolytic bacteria).

Within the first 30 days mulching must happen every 5 to 7 days in order to ensure that the heaps are oxygenated and homogenized, and in the following 2 to 3 months in succession, mulching can occur every 15 to 20 days.

So as to reach a point that the heaps are ready, they can go to 3 meters in height with a base of 6 to 8 meters from the 31st to the 60th day; from the 61st to the 90th to 120th day, the height can reach 4 to 6 meters without any limits to the base.

COMPOST STARTING AND ITS HEAT CONDUCTION

A proper start to composting requires, 0,5 to 1 kg MICROMIX diluted in a quantity of water which permits uniform distribution of the injection and if necessary, humidify the bio mass, for every 2.5 ton of dry substance.

It can become necessary, after one week, to add urea and or saccharin substances, together or separately with respect to the evolution of the fermentation processes.

For example if ammonia is expelled it is necessary to add molasses or other substances riche in sugars to avoid nitrogen losses; if the carbon readily available has been consumed by the bacteria it is necessary to add urea to avoid slowing down the process and avoid carbon losses, in the form of carbon dioxide, which leads to having a lesser amount of organic substances within the compost. In order to maintain humidity with the optimal value range, water must be introduced before it falls below the minimum value, by way of sprinkling and taking care that it permeates through the bio mass and does not run off the sides.

Should the pH radically fluctuate from the optimal values, these must be compensated with appropriate corrective measures; if the pH falls below 5,5 when adding calcium carbonate powdered fine or hydrated lime, or if it rises above 8 when adding mineral phosphate or saccharine substances.

CONCLUSIONS

The compost obtained in this way is of a superior quality than that found in commerce. It has is high in agronomic worth, because it is void of phytotoxins, with a high quantity of organic substances well composed with humus and rich in micro-organisms which are useful to agrarian science; furthermore it is odorless and absent of invading plants.

The recycling of stabilized residue in agriculture, by way of precise composting affords economic, energy, and material savings. In more detail, companies see a real saving when buying synthesized fertilizers because 30 to 70% less of them is required, and the savings rise from 60 to 90% for the purchase of micro elements; plants are more resilient and require less treatment with phytopharmaceuticals their purchase and distribution thereof; there is a progressively lesser need, year after year, to work the land deeply and a lesser use of mechanical implements accompanied by a lesser consumption of energy.

The ecosystem benefits clearly from a lesser use of gasolines, chemical fertilizers, and phytopharmaceuticals. Organic humus substances returned to the soil begets a real quality to quantity ratio of improvement for the agricultural produce.