

ORGANIC AGRICULTURE

6 th. lect. Theory 2023 – Horticulture Dept.

Organic fertilizers and soil improvement:

Types of organic fertilizers:

First: Crop residues:

You can add a lot of plant waste to the soil surface, such as cotton residues, corn, soybeans, rice, cane, sugar beet, flax, barley, sunflower, sesame, lentils, chickpeas and beans, etc., can also be used all remnants of vegetables and waste from crops for some of them manufacture and outputs pruning of fruit trees.

And the advantage of addition plant waste to the soil lead to the improvement of the following:

- Increase the production of agricultural crops.
- Increase the available soil moisture for plants.
- Increase the amount of humus in the soil.
- Increase the number of beneficial microorganisms in the soil, like bacteria and fungi.
- Reducing soil erosion that done by water and wind.
- Reduce the cohesion of the soil.

But there is some disadvantage when we use the remnants crops agricultural, and can summarized the following:

- Increase the insects, diseases and weeds.
- Increase moisture and coolness in the surface layer of the soil and that lead to a slow germination of agricultural crops seeds.
- Difficult to get in touch the seeds with soil, and these lead to disparity of plants growth.

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Second: Green manures:

We can define it as: **Green crops grown on agriculture land and when they reach a certain age or size are plowing and mixing it with soil.**

It can be used with some of the crops like legume crop (such as alfalfa, clover, cowpea and beans, etc.), or we can also use crops (such as barley, mustard, millet, corn and lentils), and is characterized by those plants for green fertilization (its depth roots, lack of fibers and the speed of its growth), and the benefits or the advantage of green fertilizers as follows:

- It is a source of organic matter.
- It adds an amount of nitrogen to the soil.
- Increase the amount of ready-to-use phosphorus for the plant.
- The elimination of the weeds.
- Increase the activity of the soil alive (microorganisms).
- Protect agricultural soils from erosion.

Third: Animal fertilizer (animal leavings):

Prepare animal fertilizer from the most important organic fertilizer which works on improving the soil's physical and chemical properties and vitality, so it increases the coherence of light soil and disintegration of heavy soil, and makes the soil more capable of retaining moisture and increasing the disintegration of minerals. Besides that, it provides by macro and micronutrient elements as well as increases the preparation and activity of microorganisms that are present in the soil, and installation of chemical animal fertilizer is complex and it differs, depending on the type of animal that is taken from its compost, in addition to the old, the state of living, style of nutrition and the plural way of compost and storage.

Fourthly: Industrial organic fertilizer (Compost):

Can define **Compost industrial**: as compost, which can be obtained from the fermentation of plant waste from rice chaff, straw, reeds, papyrus, forest and cultivated plants, some field crops and residues of pruning trees.

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Fifth: Fertilizers or Bio- fertilizer:

It means: **Soil or seeds or tubers vaccination with microorganisms, and these make the change of soil biology content nearby from the root hairs, called “Rhizosphere“ and help the plant to get its food needs.**

And the efficiency or success operation of bio fertilizing depends on the following:

- 1 - Efficiency of micro-organisms usage.
- 2 - Conformity between micro-organisms with host vegetation.
- 3 - The ability competitiveness of micro-organisms in at bio compost with similar micro-organs that present at the soil agricultural.
- 4 - The numerate present of micro-organisms in the rhizosphere area and its ability to survive in this region.

The most commercial bio-fertilizers, which are used widely in agriculture in general and organic farming, in particular, its:

- A- Microben.
- B - Biofertan.
- C - Rhizobactrin.
- D - Biogene.
- E - Phosphorene.
- F - EMI (Effective microorganisms).

Sixth: Organic fertilizers non vital:

used at agriculture organic, dissolved organic fertilizers which contains on some organic acids like humic acids, fulvic acids and amino acids as well as abstracts or remains of some plants and extracts of seaweed and the remnants of fish, insects and worms.

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Among the most important of these fertilizers that can be used in organic farming include:

1 – Humic and volvic acids which including:

A - Humic acid 18.

B - Hum - Hp.

C - Humicine .

2 - Compounds containing amino acids which including:

A - Solary.

B - Amino - life.

3 - Compounds containing organic and amino acids such as:

(Amino green compound).

4 - Abstracts of seaweed and algae such as (jester feed) fertile.

5 - Ascobene.

Seventh: The Natural Mineral substances:

These substances include such as rock phosphate, rock powder and magnesium carbonate, gypsum, potassium salts, sulfur, rock materials and clay minerals such as Bentonite and Vermiculite.