

AGRICULTURAL BIOCHEMISTRY

Unit 1

Soil science

1. Definition of soils- properties of soils- physical property- components- structure and texture- soil water, soil air, soil temperature.
2. Chemical properties- soil mineral water- soil colloids- in exchange reactions- soil fertility and its evaluation, soil organic matter and their transformation into soil- carbon and nitrogen cycle.
3. Soil reactions- soil pH- soil acidity and buffer actions- its effect on the availability of nitrogen, phosphorus, potassium, calcium, magnesium, zinc, iron, manganese and sulphuric acid, saline and alkaline soils- their formation and reclamation.

Unit 2

Fertilizers:

(1). Nitrogen Fertilizers- effect of nitrogen on plant growth and development- importance of nitrogenous fertilizers and classification of nitrogenous fertilizer- nitrate- ammonia, urea and cyanide. (2). Phosphate fertilizers- effect of phosphorous on plant growth and development. (3). Potassium fertilizers- function of potassium on plant growth. (4). Manures- Bulky organic manures- farm yard manure- handling and storage- method of composting green manuring- concentrated organic manures and their chemical composition- oil cakes- blood- meal- fish manures.

Unit 3

Pesticides: Classification of insecticides, fungicides and herbicides- mode of action- general methods of application and toxicity- safety measures in using pesticides- metabolism of pesticides- pesticide residues in food produce cytotoxic and carcinogenic effects of pesticides.

Unit 4

Fungicides and Herbicides:

1. Fungicides- inorganic sulphur compounds- copper compounds- mercuric compounds- organic dithiocarbamates- dithane M-Bordeaux mixture.
2. Herbicides: Inorganic herbicides- arsenical compounds- Boron compounds- cyanamide, cyanides and thiocyanates. Chlorates and sulphamates- organic herbicides- nitro compounds- chlorinated compounds- triazine compounds- propionic acid derivatives- urea herbicides.

Unit 5

Biological control of pests: Direct use of pesticide producing microbial sprays like *Bacillus thuringiensis*, genetic engineering of plants to produce pesticide toxins using Ti plasmids as vectors.

References

1. Agricultural chemistry Vol. II Eonald EH Frear.
2. A text book of soil science- J.A. Daji.
3. The nature and properties of soils- Harry, O. Buckman and Nylee Brady.
4. Soil science- Dr. A. Sankaran.
5. Soil Chemistry analysis – M.L. Jackson.
6. Insecticides and pesticides and agrobased industries – R.C. Palfwal, K. Goe, R.K. Gupta.
7. Chemistry of Pesticides – E.H. Freer.
8. Weed control as a science – Cklingmann.
9. The chemical protection of plants – G.S. Gruzdyer.
10. A text book of Biotechnology – R.C. Dubey.