

Practical 11

IDENTIFICATION OF ORGANIC MANURES

EXERCISE 11.1: IDENTIFICATION OF ORGANIC MANURES-FARM YARD MANURE, VERMICOMPOST, CAKES, BONEMEAL

Objective :

- To impart knowledge to identify organic manures and bio-fertilizers used in horticultural crops.

Delivery schedule : 02 sessions

Student expectations/learning objective:

- The characteristic features of organic manures for their easy identification

Pre-learning required: Importance of organic manures in horticultural crops.

Handouts/material required/equipments & tools: Paper sheet and pen to note down the instructions, samples of different organic manures, petri dishes.

Introduction

Organic manures are plant and animal wastes that are used as nutrients after decomposition. Manures are complex compounds from plant, animals, and human residues that are used by plants as source of nutrient. Manures are low in nutrient content and have longer residual effect. Nutrients from manures are released only after decomposition of manure by micro organisms. Organic manures and leguminous green manures are most valuable from crop nutrition point of view. In addition, farmyard manure, crop residues and composts are most important from utilization and organic recycling point of view. Organic resources reduce the mining of soil nutrients and improve physical property of the soil by improving soil tilth, aeration, water-holding capacity and activity of microorganisms. Manures are classified into two groups depending upon nutrient content they contain e.g.

- I. Bulky manures: Farmyard manure, compost, vermicompost, Sewage and sludges

II. Concentrated manures: Oil cakes, Blood meal, Meat meal, Fish meal

I. Bulky Manures

1. **Farmyard manure (FYM):** It is blackish brown in colour, moist and sticky. It carries foul smell. The decomposed mixture of dung and urine of farm animals along with litter and left over materials from roughages or fodder fed to cattle is farmyard manure.



Farmyard manure

2. **Compost** is mass of rotted organic matter made from farm waste. Composting is a process in which both aerobic and anaerobic micro-organisms decompose organic matter under medium to high temperature and low carbon-nitrogen ratio of refuse.
3. **Vermicompost:** It is granular, non-sticky and blackish brown in colour. It does not carry any smell. The compost is prepared with the help of earthworms. It is a rich mixture of major and minor plant nutrients. It also increases total microbial population on plant root system and thus improves soil fertility.



Vermicompost

Concentrated organic manures

Oil cakes: Oil cakes can be grouped into edible oil cakes which are suitable for cattle feeding and non-edible oil cakes which are unfit for cattle consumption.

Blood meal: An adult cattle gives about 13.6 kg blood meal and goat or sheep about 1.36kg. It is effective for all horticultural crops and all types of soils.

Meat meal: The meat is converted into meat meal. It is quick acting and suitable for all types of horticultural crops and soils.

Fish meal: Non-edible fish carcasses and fish offal are used to prepare fish meal. These are crushed and powdered before use.

Bone meals: Bone meals have been used as manures for time immemorial. Bone meals are of two kinds (i) Raw bone meal and (ii) Steamed bone meal. Raw bone meal

contains about 25% P_2O_5 and 4% N which is in the slow acting organic form. Steam bone meal contains 25-30% total phosphorus(P_2O_5) and about 1-2% N. It contains about 25% citrate soluble phosphorus (P_2O_5). Steam bone meal is applied to soil few days before sowing of crop.

Basic slag: It is a by product of the steel industry where the original iron ores contain appreciable amounts of phosphorus. It is a grayish black powder with a very high specific gravity. It contains 8-12% P_2O_5 .

OIL-CAKES



Jatropha oil cakes



Pongamia oil cakes



Cottonseed oil cakes

ANIMAL BASED CONCENTRATED ORGANIC MANURES



Horn and Hoof meal



Raw bone meal



Crushed bone meal

Sources of manures: The various sources of manures are as follows:

1. Cattle shed wastes- dung, urine and slurry from biogas plants
2. Human habitation wastes- night soil, human urine, town refuse, sewage, sludge and silage
3. Poultry litter, droppings of sheep and goat
4. Slaughterhouse wastes such as bone meal, meat meal, blood meal, horn and hoof meal, Fish wastes
5. Byproducts of agro industries like oil cakes, biogases and press mud, fruit and vegetable processing wastes etc.
6. Crop wastes namely, sugarcane trash, stubbles and other related material
7. Water hyacinth, weeds and tank silt, and
8. Green manure crops and green leaf manuring material

Exercise : Identify different organic manures and record your observation in the data sheet

- i) Bulky organic manure
 - a. Farmyard manure
 - b. Vermicompost
- ii) Concentrated organic manures
 - a. Oil cakes
 - b. Fish meal
 - c. Bone meal
 - d. Blood meal etc.

PRECAUTIONS

- Identify each sample separately to avoid confusion.
- Avoid tasting of the samples.
- Handle the manures carefully.

Data sheet

Sample number	Name of organic manure	Origin	Specific identifying feature
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			