RAMA UNIVERSITY

www.ramauniversity.ac.in

FACULTY OF AGRICULTURAL SCIENCES AND ALLIED INDUSTRIES

Lecture 6: CONCENTRATED ORGANIC MANURES

I. BONE MEAL

Bone meal is a white to whitish material produced by treating the bones obtained in abattoirs (Slaughter houses) .The bones are dried, crushed, degreased and cleaned to obtain bone grist .Finely ground ,it serves as an organic N- P fertilizer.

Deamination: It is a process of removal of proteins from the grist which yields deaminated bone meal**.** It is also referred as steamed bone meal. Bone meal is a P-fertilizer of organic origin i.e., it contains $Ca_3 (PO_4)_2$. It has 1.0 to 2.0 per cent N and 10-13 per cent P. Bone meal has some residual effect. Rice and other cereals and other orchard crops respond well to its application. It is particularly useful for soils high in Fe and Al content and applied along green manures with advantage prior to sowing or planting. It can be used for crops rather indiscriminately without fear of salt damage (burning) unlike chemical fertilizers.

II. HORN MEAL :

Horn powder, horn grist or horn chips can be obtained depending on the degree of crushing and collectively termed as horn meal .This is a slow acting fertilizer of Nitrogen containing 14 per cent N.

About 3-4 kg horn and hoof material can be obtained from each animal .Horn and hoof meal manufactured in India annually to the extent of 14,000 tones provided horns and hoofs of all the dead animals are collected and processed .

Horn and bone meal mixed fertilizers yield organic N-P depending on their composition (N from Horns and P from Bones)

III. BLOOD MEAL/ BLOOD POWDER :

Blood is collected from abattoirs (slaughter houses) dried and ground. Two types of dried blood are manufactured.

Red product: It is obtained by drying the blood with super heated steam and hot air.

Black product**:** It is obtained by evaporating the liquid blood over sand bath subjected to higher temperatures .It is evenly causes the loss of N and causes Charring.

Both red and black products are spread on the concrete floor covered with a net and allowed to sundry . This powder is used as manure

Characteristics:

1) Blood meal absorbs moisture on exposure to atmosphere

2) Of all the protein organic manures, dried blood has the highest availability of N and given a rating of 80 (i.e.,) it is 80 per cent as efficient as the inorganic N fertilizer in providing the nitrogen to the crop.

3) An adult bovine (cow, buffalo /ox**)** gives 15 kg where as sheep or goat yields 1.5 kg of dried blood.

4) About 30-40 kg of dried blood is obtained from 100 kg fresh blood.

5)The principal component of blood is N .Which is 10-14 % in slow acting form.

IV. MEAT MEAL :

It is also referred as TANKAGE obtained from rejected carcasses (meat products) mostly meat and waste products such as leather scrap, feather,wool etc.,

.These materials are cooked in steel tanks under pressure of 2 to 7 kg / cm^2 for 30-90 minutes. Addition of sulphuric acid (0.5%) facilitates hydrolysis at low temperature . It is dark brown and fluffy material . It contains 7 %N , 1 to 5 % P and 3 to 10 % K . Tankage has the rating of 60 per cent .

V. FISH MEAL :

The non-edible fish, fish carcasses and offels (parts of butchered animal) are used to prepare fish meal .Such material are crushed or powdered after drying .The oil is generally removed before the meal is ground and facilitate easy decomposition .It is quick acting fertilizer suitable for all crops on all soils .It contains 7 to 8% N ,2 to 3 % P_2O_5 -and 0.2 to 0.5 % K_2O

VI. GUANO:

The name Guano is originated in PERU, from the word "HAUNO" to mean manure. GUANO is a product of sea bird (Pelican, Gannets, and Albatrosses) excrement covered over long periods and occurring in natural deposits. It contains 8 to 15 % N and 2 to 3 % P. The chemical constituents are mainly ammonium oxalate and ammonium phosphate as well as calcium phosphates. There are important admixtures besides 2-4 % K.
Raw guano is some times processed into guano fertilizer by acid decomposition with sulphuric acid.This is called peru guano: 6+12+2 (N+ P_2O_5+ K_2O).

VII. OIL CAKES :
After removal of oil from seeds, the residue is made in to cakes. Oil cakes are used as organic fertilizers as they are rich source of organic nitrogen in protein form. In addition to N, small amounts of P, K and micronutrients . Oil cakes are classified into two groups viz.,

Edible oil cakes: Suitable for cattle and poultry feeding and also as a manure /fertilizer but not economical Eg. Groundnut , Gingelly cakes etc.,

Non –Edible oil cakes : Suitable for crop fertilization. Eg. Castor cake ,neem cake etc.,

Edible oil cakes serve as fertilizers, but their use is restricted due to economic reasons .Composition of oil cakes are variable .Oil cakes are quick acting organic manures .The decomposability increases with decrease in oil content .They nitrify in about 30-45 days on addition to the soil .The rate of decomposition can be hastened by grinding the oil cakes into fine powder and thorough mixing with the soil .

1) Castor cake :

it is also called as castor pomace. It is the ground residue of beans from which oil has been extracted .it is poisonous to animals and used only as fertilizer .it is a by-product in the manufacture of castor oil. It contains 5 to 6 % N , 1 % P_2O_5 and 1.0 % K_2O . It has got a rating of 75 per cent.

2) Neem cake :

Neem cake is prepared by crushing the neem seed (with shells) in expellers and oil is separated . Neem tree is regarded as a "village dispensary" by virtue of its medicinal and antiseptic value . Neem cake is useful for cash crops mainly due to insect repellant or insecticidal properties

owing to the presence of residual bitter and sulphur .Comparatively it contains higher N. It cannot be used as a cattle feed due to its bitter taste.

Chemical composition of neem cake

S.No.	Constituent	Content (%)
1	Organic matter	84.5
2	Moisture	9.9
3	Carbohydrates	17.5
4	Protein	36.2
5	Fiber	11.7
6	Oil	18.2
7	Ash	6.8
8	N	5.8
9	P	0.46
10	K	1.12

Neem cake has also been used as coating material over urea super granules as the former is reported to improve the fertilizer efficiency of soil applied urea.