apart. Vegetable seedlings can then be planted around the baskets 20-30 cm away from them.

b) **Sunken basket composting:** fresh manure mixture from the enclosure is placed in a circular hole of at least 40 cm deep and 50 cm diameter (depending on plant spacing) dug in the centre of two or four perennial crop plants like bananas, mangoes, citrus and avocado and then covered with a layer of topsoil

c) **Trench composting:** fresh manure mixture from the enclosure is placed in trenches of 50 cm wide and 50 cm deep usually dug between rows in established perennial crops like bananas and coffee and then covered with topsoil. Trench composting is common with farmers because they do not have to turn the material.

LIQUID ANIMAL MANURES

Liquid manure is made to provide crops with plant nutrients quickly during the growing cycle. It can be used to complement compost or inorganic fertilizer. Liquid manure should be applied in the morning or evening when it is cool.

Liquid Manure from Animal Dung

To make liquid manure from animal dung, you need (a) animal dung (preferably fresh) from cattle, sheep, goats, rabbits, pigs, and poultry, (b) a container (preferably a drum), (c) a gunny bag, (d) a string, and (e) a strong stick (about 1 metre long).

a) Fill the gunny bag with the animal manure or mixture of manures and then tie up the mouth of the bag securely.
b) Suspend the bag from a strong stick placed across the mouth of the drum.
c) Fill the drum with water and cover it to prevent excessive evaporation. The ratio of manure to water for other containers should be the same as that for the drum.
d) After 3 days, stir the manure everyday by lifting the immersed bag out of the drum several times.
e) After about 14 days (when water is blackish), remove the bag.
f) Dilute the contents of the drum by adding to one container of the liquid manure, two equal containers of water.
g) Apply in the root region a cupful (about ½ litre) of the diluted liquid manure per plant to annual crops and about 6 cupfuls (about 3 litres) per plant to perennial crops once every two weeks.
h) The manure remaining in the gunny bag can be used as mulch or applied to crops directly as top dressing.

Animal Urine Manure

a) Make an animal shed with a slanting floor that drains to a common point.
b) Construct a pit in which urine can drain. Cementing the pit or smearing it with cow dung or clayey soil will reduce leakages.
c) When the pit gets full, transfer the urine to a container or to another similar pit constructed under shade.
d) Cover the urine lightly and leave for 14 days.
e) Dilute one container of urine with two equal containers of water.
f) Apply the diluted animal urine manure in the same way as animal dung liquid manure.

For further information, you may contact:-

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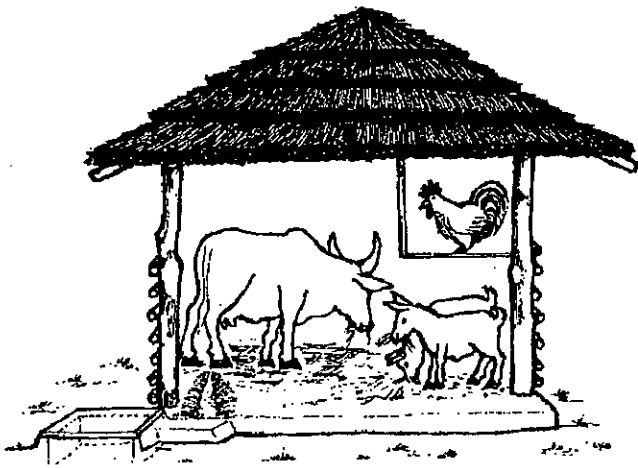
MANAGEMENT OF ANIMAL MANURES FOR IMPROVING SOIL FERTILITY



Soils Brochure Series 5

NATIONAL AGRICULTURAL RESEARCH ORGANISATION

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Introduction

Compost manure is a product of decomposition of organic materials. The quality of compost manure depends on the composition of the materials used (Table 1) and the degree of decomposition. Compost manure can improve the soil physical properties and increase the capacity of the soil to supply plant nutrients. Continuous application of compost manure can enrich poor soils and maintain the fertility of rich ones.

Making Compost Manure

Compost manure can be made in different ways. The procedure you choose will depend on the organic materials available.

1. Making Simple Compost from Household Organic Trash/Crop Residues

Regular quantities of compost can be made from household organic trash or crop residues such as banana peelings, bean trash, groundnuts trash, coffee husks and livestock manure. Normally, 3 pits are used to make compost. Turning from one pit to another facilitates uniform decomposition and thorough mixing of the material.

a) Prepare 3 pits 2 m long by 1.5 m wide and 0.5 m deep in a cool shady place.
b) Fill pit 1 with organic trash/crop residue to the brim. It takes some time to fill this pit. Hence covering pit 1 is not necessary.
c) When pit 1 is full, transfer the material to pit 2, and begin filling pit 1 again.
d) In pit 2, add to the heap ash and diluted animal urine if available. The urine is diluted with water in the ratio: 1 container urine to 3 equal containers water.
e) Cover the heap in pit 2 with a layer of topsoil 5 cm followed by dry vegetation to avoid evaporation.
f) Water the heap in pit 2 at frequent intervals. This is not necessary when it is raining.
g) After 3 weeks, transfer the contents of pit 2 into pit 3.
h) Cover as in (e) and water as required.
i) Drive a dry stick at an angle into pit 3. Remove it and feel it for warmth after every 7 days.
j) This should be continued until the stick when removed feels cool. The compost in the pit is then ready.
k) Repeat the process from (b) to (j) to get a continuous supply of compost manure.

2. Vegetation Compost

Vegetation compost can be made out of the following materials: fibrous material such as hedge cuttings, maize stalks and fodder remains, plant materials both dry and green, livestock manure, topsoil and ash. Legume plants like *Mucuna* if available will produce high quality compost.

a) The compost is prepared under shade to prevent drying out or excessive wetting.
b) Prepare a pit 1.5 m long by 1.5 m wide and about ½ m deep in a wet region or 1 m in a dry region.
c) Put the fibrous material chopped to a length of about 5 cm on the bottom layer about 30 cm thick and sprinkle with water.
d) Dry vegetation material such as grass, banana leaves and tree leaves should form the second layer of 10 cm. Sprinkle with water.
e) Put a layer of semi-decomposed animal dung or old compost or slurry from a biogas plant to a thickness of 10 cm and sprinkle with water.
f) Sprinkle with topsoil to just cover the materials.
g) Add green vegetation such as green plants (preferably leguminous) and kitchen trash that decompose easily to a thickness of 15-20 cm.
h) Sprinkle ash or a mixture of ash and animal dung on top of the pile.
i) Sprinkle water on the whole pile adequately.
j) Repeat the procedure starting from (d) until the pile is about 1 m high.
k) When the pile is complete, put a final layer of top soil 2.5 to 5 cm thick and cover the whole pile with dry vegetation to avoid evaporation.
l) Take a dry sharp stick and drive it into the pile at an angle. This stick assists in showing whether the pile is dry or wet. Decomposition will have started within 2 to 3 days if the stick when removed feels warm and moist.
m) The stick should be left in the pile and removed every 7 days to monitor for warmth and moisture.
n) Depending on the weather conditions, the pile should be watered every 3 to 5 days. This is not necessary when it is raining.
o) After 3 weeks, turn the pile in such a way that the different layers mix. This facilitates faster and complete decomposition of all the materials. Do not add any fresh material except water. Turning should also be done when the stick feels cool. Monitor for warmth and moisture using the stick and water when necessary.
p) Three weeks after the first turning, turn the pile again. Monitor for warmth and moisture, and water as necessary.
q) Three weeks after the second turning, monitor the warmth of the compost pile every 3 days using the stick. The compost is ready when the stick finally feels cool.
r) If the compost is ready for use but the planting season is still far away, remove it and store in a shade covered with a layer of soil, banana leaves or polythene. The compost should be kept moist.

Guidelines on Application of Composts 1 and 2

a) The larger the amount of compost applied, the higher the yields and the longer the soil remains productive.
b) Compost incorporated in the surface soil gives better yields than that applied on the surface or buried deep in the soil.