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Principal Chief Conservator of Forests.

**CIRCULAR NO. 15/2002**

*(This circular was issued by me as Vice-Chairman & Managing Director, Andhra Pradesh Forest Development Corporation vide ref.no.6.5.1144/DM/2002 dated 14-06-2002. This may be used as a ready reference on the subject).*

To  
The Regional Managers  
Visakhapatnam / Rajahmundry / Nellore / Hyderabad &  
General Manager (P & P) Head Office.

Sub: Establishment of Vermi-compost units in the plantations-certain instructions  
- Issued - Reg.

We have been applying chemical fertilizers every year to our plantations in general and particularly to the horticultural crops like cashew and coffee in particular to improve the nutrient status of the soil for better yields. But a stage has now come when we should reduce gradually the application of chemical fertilizers to a minimum in order to maintain better health of the soil.

Excessive use of inorganic fertilizers a) kills the beneficial soil microbes, whose presence is conducive to the plant growth, b) increases the pollution levels in the air, water and soil and c) increases the incidence of plant pests and diseases. Hence it is imperative to use eco-friendly organic manures more and replacing correspondingly the quantity of inorganic fertilizer.

We can produce organic manures using agriculture and plantation residues by establishing compost pits and vermi-compost units in strategic locations. In course of my field inspections, instructions have already been issued in this regard. Vermi-compost units are already established at places like Bapatla, Diwan cheruvu, Kothagudem, Sathyampeta (Paloncha), Kurnool, and Dulapalli (Ranga Reddy). There is a necessity to increase the number of production units to cater to the needs of more and more plantation areas so as to reduce the usage of chemical fertilizers.

Therefore, the Regional Managers and the General Manager (P&P) may please take action for the establishment of compost pits in our estate series where the contiguous plantation area is 100 ha. or more. Action should be stepped up to establishment of compost pits and Vermi-compost units is described in detail in the **Annexure.**

The establishment of at least one Vermi-compost unit to start in each division is of utmost importance in order to reduce the use of inorganic fertilizers gradually in our plantations - particularly to the horticulture crops like cashew and coffee. While

selecting the site, care should be taken to ensure that Vermi-compost unit is located in a place where it is easily accessible and convenient for the purpose of constant supervision and to have a watch and ward for 24 hours. Therefore it is imperative that the units should not be located in remote areas not amenable for proper supervision and the person in-charge of watch and ward may not stay away on the plea of fear of safety and security.

The successful example of Vermi-compost unit established at Bapatla in Kavali division in the year 1999 may be mentioned in this context. The total quantity produced by this unit so far is more than 9 MT, the expenditure and revenue is at the ratio 1:2. Vermi-compost is an important organic manure which has got a very good commercial value. Therefore, all efforts should be made to see that the amount invested is recovered by sale of Vermi-compost besides meeting the application needs of our plantations.

Sd/- **(S. K. DAS)**  
Vice Chairman & Managing Director

## ANNEXURE

### COMPOST PITS:

To begin with one compost pit would be ideal for every 100 ha. plantation. The method of preparation of the compost in the pit is as follows:

Dig a pit of 10 m X 5 m and 1.20 m depth. Make leaf litter and twigs available in the plantations into pieces. Organic waste like agricultural residues, vegetable market waste, cow dung, farmyard manure, sugar cane bagasse can be filled up in layers. Apply cow dung slurry and urea solution. A thin layer of local soil over each layer will provide the required soil microbes. Cover the pit with soil. Wet the pit periodically to facilitate early decomposition. Decomposition process may take 45-60 days. Fully decomposed material is warm and does not emit bad odour.

### VERMICOMPOST:

Vermi-compost is the excreta of the earthworms, on digesting the organic wastes. Vermi-compost is brownish or blackish in colour, and is odourless and granular in texture. Earth worms feed on agricultural waste, castor and groundnut residues, coir dust, sugar cane bagasse, household wastes, vegetable market wastes, poultry wastes etc. These organic wastes are passed through the digestive system of earth worms and come out as excreta compost. The humus contains a high percentage of humic and folic acids that facilitate immediate availability of nutrients to plants. Vermi-compost improves the texture and composition of soil. It also acts as a biological insecticide thereby controlling the harmful soil pathogens and insects. Its application will improve the water retention capacity and aeration of the soil, besides biodynamic action which increases the organic functions of plants.

It view of these advantages and benefits to the plant with the application of vermi-compost in addition to avoiding ill effects due to application of chemical fertilizers, it is our responsibility to encourage the usage of compost in our plantations. Therefore, the Regional Managers and the General Manager are advised to establish one vermi-compost unit in each centre / Range. A brief account on Vermi-compost is detailed below:

#### (A) EARTHWORMS:

Earthworms are classified into 2 categories. (1) Manuring worms (2) Soil procuring worms. Manuring worms are of 2 types - classified as endogenic and epigenic. The endogenic species are burrowing type and the epigenic species are non-burrowing type. It is only the non-burrowing earthworms that are useful for Vermi-compost production.

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| (a) <i>Eudrilus eugeniae</i> : | This earthworm, an African species and bigger in size measuring 8" to 12". It is red or violet in colour. It is voracious eater. |
| (b) <i>Eisenia foetida</i> :   | A European species measuring 2" to 5" in size. It is also red or violet in colour.   |

Both these species are useful in Vermi-compost production in these areas. These earthworms can feed on 100% organic wastes without soil. Lifespan is 2 to 3 years. One earthworm can produce 200 to 300 earthworms in a year. Earthworm though hermaphrodite, self fertilization does not occur generally. It lays cocoons, which consist of 8 to 20 eggs but only a few are fertile which give rise to juveniles (Baby earthworms). For a cocoon to hatch, grow and in turn to produce, it takes 60 days.

### **(B) Technology of production:**

#### *(i) Components for vermi-compost Production :*

- (a) Non-burrowing type earthworms (1000 Nos. for each Sq. m. of bed) (*Eudrilus eugeniae*, *Eisenia foetida*)
- (b) A shed with thatched or tar sheets roofing with 15' height at centre and 6' at eaves. This is essential to protect the earthworms from Sunlight, rain etc.
- (c) One-foot height floor above the ground level to prevent entry of water and slip away of earthworm into the soil.
- (d) The size of the bed is L X 2-3 ft W X 2 ft ht. Preferably brick masonry work is required. If the height of the bed is more than 2 ft, aeration is poor to the earthworms resulting in low production. Width of the bed will be 2-3 ft so that it will be easy to work. The length depends on the length of the shed.
- (e) Fencing in all the sides of the shed (with thorny material) to prevent entry of pigs, cattle, birds, frogs etc.
- (f) Jute bags for spreading on the top of bed to prevent evaporation of moisture and to protect from predators.
- (g) 2-3 mm size sieve for collection of Vermi-compost.
- (h) Fresh cattle dung to start the process of decomposition.
- (i) Lime water for controlling the throat infection of earthworms.
- (j) Bone ash for better reproduction of the earthworms.

#### *(ii) Pre-treatment of the organic wastes:*

The organic wastes such as sugarcane bagasse, and cow-dung generate heat if applied fresh. Hence, they should be cooled outside the beds on a solid platform by turning frequently while spraying water. This will result in a good quality feed material. The earthworms may die because of excessive heat generated in the process of decomposition. Add 100 to 150 grams of lime and 1 kg of bone meal per ton of the organic wastes outside the bed.

#### *(iii) Filling the beds:*

- (1) Sprinkle water on the floor of the bed before filling the pit.

- (2) Form 3" thick bottom layer bed with coconut fiber and pack it by profuse watering.
- (3) Form 2" to 3" second layer with cow dung sludge. This layer will be immediately useful as the feeding material to the earthworms. This is also called starter dose.
- (4) Then, release one Kg of earthworms for each 3 Sqm. on the second layer and spread evenly on the bed. Care should be taken that the earthworm is not damaged.
- (5) On the top of the second layer form 12" to 14" thick organic wastes with green and dry leaf, kitchen wastes, animal wastes, cow dung etc. Partly decomposed Farm Yard Manure can also be used. Care should be taken that the organic wastes do not contain the glass pieces, plastics, vinegar, soaps etc.
- (6) Sprinkle the solution made up of cow-dung, and small quantity of lime powder on the top to activate the earthworms.
- (7) Cover the bed with gunny bags during the day time to provide dark atmosphere and remove it in the night time for better aeration.
- (8) Spray water with rose cans two times a day at 9 a.m and 5 p.m. Earthworms are more comfortable in humid and dark atmosphere and below 35° C. Care should be taken during summer season to maintain temperature and humidity by spraying water and covering the side of the shed with gunny bags or Bamboo mats.

Once the total feed material is eaten away, the earthworms come on top of the bed and attach themselves underneath the gunny bags. At this stage, stop watering for 2 days. Earthworms will go to bottom layer (moisture zone). Now heap the entire bed material in small quantities. Sieve the collected material to separate Vermi-compost from earthworms. Keep the surroundings always free from ants and rodents.

(iv) The rate of Production of Vermi-compost is directly proportional to number of earthworms. Once earthworms reproduce more, production will become faster from the beds. Earthworms reproduce prolifically in humid and low temperature. The production output is generally 60%.

**Sd/-(S. K. Das )**  
Vice Chairman & Managing Director