

STUDY ON SUITABLE FEEDING MATERIAL FOR VERMICASTING PRODUCTION INVOLVING COFFEE WASTAGE MATERIALS

EP No: 21/2006-07; **Research centre:** Valkaradu Modern Nursery Centre,

Range: Dindigul Modern Nursery Range, Modern Nursery Division, Dharmapuri;

Scheme:- TAP scheme

Introduction:

Earthworms play a vital role in soil health and organic waste decomposition, making them essential for sustainable agriculture and vermicomposting. Their reproduction rate is significantly influenced by the type and quality of feed they consume. Identifying the most suitable feed for earthworms can enhance their growth, reproduction, and overall efficiency in vermicasting production. Various organic materials, such as cow dung, sugarcane bagasse, and plant residues, have been studied for their impact on earthworm reproduction. This study aimed to evaluate the suitability of pure coffee waste, coffee waste mixed with farmyard manure (FYM), and coffee waste combined with leaves for vermicasting production. The experiment was conducted at the Modern Nursery Centre, Valkaradu, under the Modern Nursery Division, Dharmapuri, during 2006-2007 (EP No. 21/2006-07).

Objectives:

The study aimed to:

1. Identify the most suitable feeding material for vermicasting production in organic tree farming.
2. Evaluate the impact of different feeding materials on earthworm multiplication.
3. Analyze the macro- and micronutrient composition of vermicasting from different feeding materials.

Materials and Methods:

Materials:

The experiment was conducted using three vermicasting production tubs, each measuring 1m × 1m × 1m. The feeding materials tested were:

- **T1:** Pure Coffee Waste (100 kg)
- **T2:** Coffee Waste + FYM (50:50, 100 kg each)
- **T3:** Coffee Waste + Leaves (50:50, 100 kg each)

Each tub was initially inserted with 500 earthworms. The feeding materials were decomposed using 1 liter of EM-7 solution to enhance microbial activity. Earthworm growth and vermicasting yield were monitored throughout the experimental period.

Methods:

The experiment was conducted over three months. The total vermicasting yield and final earthworm count were recorded at the end of the study. Nutrient composition analysis of the vermicasting samples was performed at the Soil Science Laboratory, State Forest Research Institute (SFRI), Chennai. Data were collected on total vermicasting yield, final earthworm population, and nutrient composition to determine the most efficient feeding material for vermicasting production.

Results and Discussion:

The study revealed variations in vermicasting production and earthworm multiplication across different feeding materials. The results are summarized below:

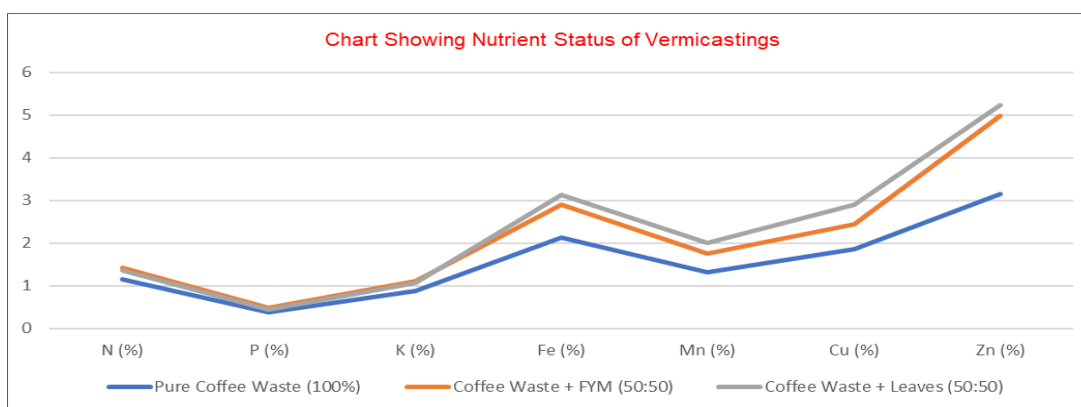
| Feeding Material | Total Vermicasting Production (kg) | Final Earthworm Count |
|-------------------------------|------------------------------------|-----------------------|
| Pure Coffee Waste (100%) | 24 | 2041 |
| Coffee Waste + FYM (50:50) | 52 | 4332 |
| Coffee Waste + Leaves (50:50) | 51 | 5126 |

Among the tested treatments, Coffee Waste + FYM (50:50) demonstrated the highest vermicasting production (52 kg), followed closely by Coffee Waste + Leaves (51 kg). In

terms of earthworm multiplication, Coffee Waste + Leaves (50:50) showed the highest count (5126), making it the most effective medium for breeding earthworms.

A comparative analysis of the vermicasting nutrient values showed variations among feeding materials. The following table presents the macro- and micronutrient composition of the vermicast samples:

| Feeding Material | N (%) | P (%) | K (%) | Fe (%) | Mn (%) | Cu (%) | Zn (%) |
|-------------------------------|-------|-------|-------|--------|--------|--------|--------|
| Pure Coffee Waste (100%) | 1.15 | 0.38 | 0.89 | 2.14 | 1.32 | 1.87 | 3.14 |
| Coffee Waste + FYM (50:50) | 1.42 | 0.49 | 1.11 | 2.89 | 1.75 | 2.45 | 4.98 |
| Coffee Waste + Leaves (50:50) | 1.36 | 0.45 | 1.07 | 3.12 | 2.01 | 2.91 | 5.23 |



The results indicate that Coffee Waste + FYM (50:50) had the highest vermicasting production, while Coffee Waste + Leaves (50:50) was the most effective for earthworm multiplication. The nutrient analysis showed that both combinations provided better nutrient values compared to using pure coffee waste alone. Overall Coffee Waste + Leaves (50:50) is the best among the three treatments in terms of Vermicasting production, Earthworm multiplication and better nutrient status

Recommendations

Based on the overall analysis, **Coffee Waste + FYM (50:50) is recommended for maximum vermicasting production, while Coffee Waste + Leaves (50:50) is the best option for earthworm multiplication.** This study highlights the importance of selecting an appropriate feeding material to optimize both vermicasting yield and earthworm reproduction for organic tree farming.