PRODUCTION OF VAM BY USING FLY-ASH AS A CARRIER MATERIAL

EP No: 34/2007-08; **Research Centre:** Thoppur Modern Nursery Centre- ,

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

Scheme:- TAP Scheme

Introduction

Vesicular-Arbuscular Mycorrhiza (VAM) fungi play a crucial role in enhancing plant growth by improving nutrient absorption, particularly phosphorus. The use of carrier materials in VAM production is essential for maintaining fungal viability and effectiveness. Fly ash, a byproduct of coal combustion, has gained attention as a potential carrier material due to its porous structure, mineral composition, and ability to support microbial activity.Integrating fly ash as a carrier material for VAM production offers multiple benefits, including sustainable waste utilization, improved soil fertility, and enhanced plant-microbe interactions. Studies suggest that fly ash can provide a stable medium for VAM spores, facilitating their colonization and distribution in agricultural and forestry applications.

The present experiment conducted to evaluate the effectiveness of fly-ash as a carrier material to find out the suitable carrier material for VAM production and also the study aimed to identify cost-effective methods for VAM production while maintaining high infection rates.

Objectives

1. To evaluate the effectiveness of fly-ash as a carrier material for VAM production.
2. To identify the optimal combination of carrier materials for high VAM infection rates.

Materials and Methods

Materials

This experiment has been carried out in Thoppur Modern Nursery Centre (Ep No.34/2007-08) of Dharmapuri Modern Nursery Range. The experiment commenced during 2007-08**.** Fly-ash, Vermicastings, vermiculite, red earth, and sand have been used as carrier material for VAM production. Sorghum has been chosen for the host plant of the study.

Methods

1. **Experimental Design: (Fly-Ash as Carrier Material):**

Five treatments applied and detailed below.

1. **T1:** Control (Red earth + Sand).
2. **T2:** Fly-ash + Red earth + Sand.
3. **T3:** Vermicastings + Fly-ash + Red earth + Sand.
4. **T4:** Vermiculite + Fly-ash + Vermicastings + Red earth + Sand.
5. **T5:** Fly-ash alone.

The carrier materials have been spread up to 20 cm height and 2 kg of mother culture has been applied to the VAM bed. Spore counts and infection percentages were recorded on the 30th and 60th days. The percentage of root colonization and spore counts were recorded

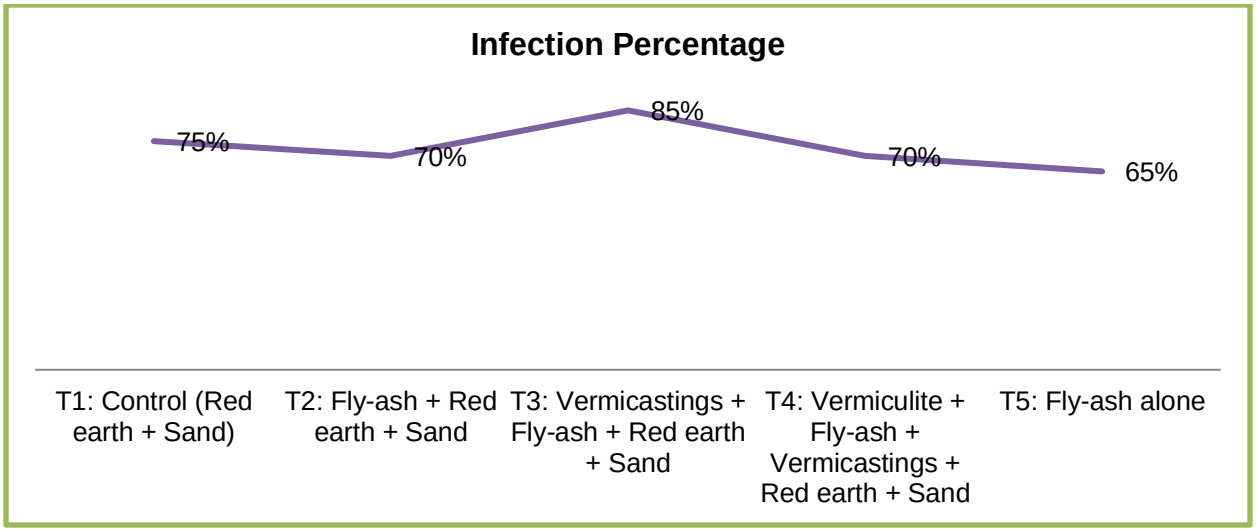
Results and Discussion

1. VAM Infection Percentage

The infection percentage of VAM spores was recorded. The results are summarized below:

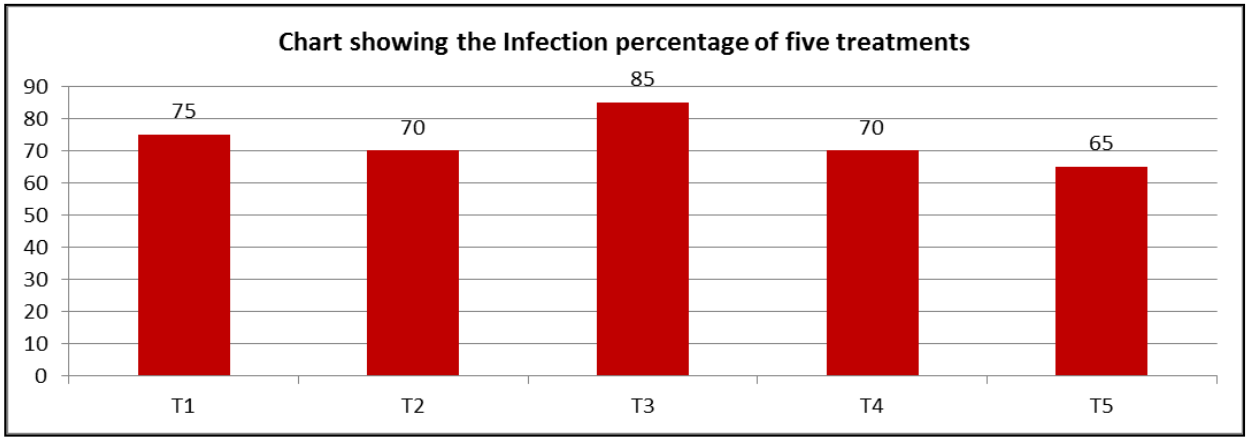
Experiment	Treatment	Infection Percentage
Fly-Ash as Carrier Material	T1: Control (Red earth + Sand)	75%
	T2: Fly-ash + Red earth + Sand	70%
	T3: Vermicastings + Fly-ash + Red earth + Sand	85%
	T4: Vermiculite + Fly-ash + Vermicastings + Red earth + Sand	70%
	T5: Fly-ash alone	65%

Among the different treatments studied, T3-**Vermicastings + Fly-ash + Red earth + Sand (each 25% ratio) had been** exhibited the highest infection percentage (85%), indicating that fly-ash can be an effective carrier material when combined with other components.



2. Cost Analysis

- Fly-ash is a low-cost material, and its use in combination with vermicastings, red earth, and sand (T3) provided the best cost effective medium and had registered highest infection percentage compared to other treatments. Pure fly-ash (T5) had the lowest infection rate (65%) and is not recommended for production of VAM.



Recommendations

- The study revealed that, T3 (Vermicastings + Fly-ash + Red earth + Sand) is recommended as the best carrier material combination for VAM production, had showed high infection rate of 85% at a low cost compared to other treatments