

STUDY ON THE EFFICIENCY OF VESICULAR-ARBUSCULAR MYCORRHIZA (VAM) IN DIFFERENT HOST SPECIES

EP No: 45/2007-08 &23/2006-07; **Research centre:** Alwarmalai, Valkaradu and Kalamavoor Modern Nursery Centre, **Range:** Dindigul and Kallakurichi Modern Nursery Range, Modern Nursery Division, Dharmapuri; **Scheme:** JA Research & TAP scheme

Introduction

Vesicular-Arbuscular Mycorrhiza (VAM) is a symbiotic association between fungi and plant roots, which enhances nutrient uptake, specifically in phosphorus, and improves plant growth. The Modern Nursery Division, Dharmapuri has conducted several experiments to identify the most suitable host species for VAM production. These experiments were carried out in various Modern Nursery Centres across Tamil Nadu, including Dindigul, and Kallakurichi. The primary goal was to evaluate the efficiency of VAM colonization in different host species and to recommend the best host for VAM production.

Objectives

1. To identify the most suitable host species for VAM production.
2. To evaluate the percentage of VAM infection in different host species.
3. To recommend the best host species for large-scale VAM production.

Materials and Methods

Materials

- **Location:** Experiments were conducted in Modern Nursery Centres (Alwarmalai, (Ep No. 45/2007-08) Valkaradu (Ep No. 23/2006-07) and Kalamavoor (Ep No. 23/2006-07)) at Dindigul, and Kallakurichi Modern Nursery Range of Modern Nursery Division, Dharmapuri.
- **VAM Beds:** Each experiment used three VAM beds size of 1m x 1m x 0.30m (l x b x h).
- **Host Species:** Sorghum, Maize, Ginia grass, Ragi, Eight Feet Maize, and Kambu.
- **Growth Medium:** The VAM beds were filled with Exfoliated Vermiculite Grade IV, Red earth, and Sand.
- **Inoculation material:** VAM Mother culture

- **Duration:** The experiments were conducted over 60 days, after which the root portions of the host plants were analyzed for VAM infection.

Methodology

1. **Sowing:** Host species were sown at a rate of 1Kg per bed.
2. **Inoculation:** VAM mother culture was spread over the beds.
3. **Growth Promotion:** Poly feed and MAP were applied to promote growth.
4. **Harvesting:** After 60 days, the shoot portions of the host species were harvested, and the root portions were chopped and analyzed.
5. **Analysis:** The roots were analyzed using the Trypan blue in lactophenol method (Phillips and Bayman, 1970) to determine the percentage of VAM infection.

Results and Discussion

The data of above experiments revealed that, among the different host species tested, Sorghum had registered highest infection percentage of 95% followed by Maize 92% while Eight Feet Maize, Guniea grass, Kambu, and Ragi showed moderate VAM infection rates of 85%, 80%, and 82%, respectively.

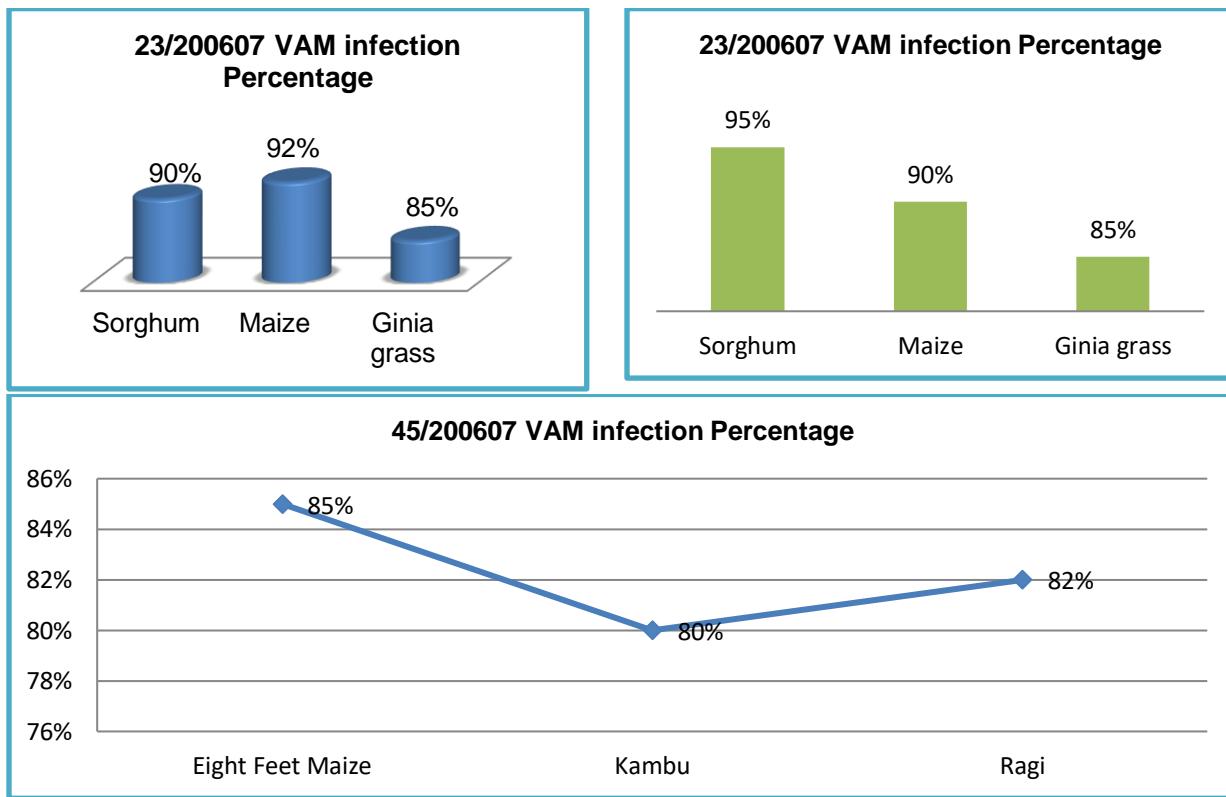
Table 1: VAM infection data of different host species

Experiment Reference	Host Species	VAM Infection Percentage
Ep No 23/2006-07 (Kalamavoor)	Sorghum	90%
	Maize	92%
	Guniea grass	85%
Ep No 45/2007-08 (Valkaradu)	Eight Feet Maize	85%
	Kambu	80%
	Ragi	82%
Ep No 23/2006-07 (Valkaradu)	Sorghum	95%
	Maize	90%
	Guniea grass	85%

The results indicate that Sorghum and Maize are the most effective host species for VAM production, with infection rates consistently above 90%. These findings are consistent with previous studies that have highlighted the effectiveness of these species in promoting VAM colonization. The high infection rates in Sorghum and Maize suggest that these species can be used for large-scale VAM production to enhance plant growth and nutrient uptake in forestry and agricultural practices. The **infection percentage of**

VAM is a key indicator of the effectiveness of the symbiotic relationship, directly impacting plant health, growth, stress tolerance, and overall ecosystem sustainability.

The chart represents the VAM infection percentage of different host species



Recommendations

1. **Sorghum** and **Maize** are recommended as the primary host species for VAM production due to their high infection rates.
2. **Eight Feet Maize** and **Guniea grass** can also be considered as a suitable host species for VAM production.