STUDY ON THE EFFICIENCY OF VERMIWASH FOR TREE SPECIES GROWTH

EP No: 20/2006-07; **Research centre:** Valkaradu & Kalamavoor Modern Nursery Centre, **Range:**Dindigul Modern Nursery Range, Modern Nursery Division, Dharmapuri; **Scheme:**TAP scheme

Introduction:

Vermiwash, a liquid biofertilizer derived from vermicomposting, is gaining attention for its potential to enhance plant growth and soil fertility. Rich in essential nutrients, enzymes, and beneficial microorganisms, vermiwash serves as an organic alternative to chemical fertilizers, promoting sustainable agriculture and forestry practices.Tree species, with their diverse nutrient requirements and growth patterns, present an opportunity to evaluate the efficiency of vermiwash in improving soil health and plant development. Studies suggest that vermiwash enhances root elongation, leaf expansion, and overall biomass accumulation, making it a valuable resource for afforestation and reforestation efforts.

This experimtne was conducted to study and evaluate the efficiency of vermiwash as an organic fertilizer for enhancing tree growth. The experiments were carried out at two locations: 1. Valkaradu Modern Nursery Centre and 2. Kalamavoor Modern Nursery Centre, both under the Dharmapuri Modern Nursery Division during 2006-07 (E.P.No. 20/2006-07). The primary objective was to determine the optimal dosage of vermiwash for promoting the growth of various tree species.

Objectives:

1. To develop and identify suitable technologies for enhancing tree growth through the application of vermiwash in varying dosages.
2. To assess the impact of different vermiwash treatments on the growth parameters of selected tree species.

Materials and Methods:

Materials:

The experiments involved five tree species: 1.*Albizzialebbeck*, 2.*Pongamia pinnata*, 3.*Azadirachta indica*, 4.*Wrightia tinctoria*, and 5.*Syzigium cumini*. A total of 250 seedlings already raised in 16 x 30 cm polybags, with 50 seedlings per species have been utilized for the study. Vermiwash was applied as an organic fertilizer in different dosages across five treatments.

Methods:

The treatments applied in Valkaradu Modern Nursery Centre and Kalamavoor Modern Nursery Centre are as follows:

T1: Control, **T2**: 5 ml of Vermiwash, **T3**: 15 ml of Vermiwash, **T4**: 20 ml of Vermiwash and **T5**: 25 ml of Vermiwash

The height of the seedlings was recorded monthly for five months to assess growth parameters.

Results and Discussion:

Valkaradu Modern Nursery Centre:

The height data for the five species as of March 3, 2008, revealed varying responses to different vermiwash treatments:

Species	Treatment	Avg Initial Height (cm)	Avg Final Height (cm)	Avg Growth (cm)
Azadirachta indica	T1	49.6	53.8	4.2
	T2	44.2	48.2	4.0
	T3	43.1	49.7	6.6
	T4	43.3	45.8	2.6
	T5	42.8	53.6	10.8
Pongamia pinnata	T1	34.7	40.5	5.8
	T2	36.2	49.1	12.9
	T3	37.9	53.0	15.1
	T4	27.4	43.5	16.1
	T5	28.2	41.1	12.9

Albizzia lebbeck	T1	72.8	95.5	22.7
	T2	72.3	102.4	30.1
	T3	67.7	75.9	18.2
	T4	59.1	65.3	6.2
	T5	45.7	55.5	9.8
Wrightia tinctoria	T1	37.6	71.3	33.7
	T2	35.8	68.3	32.5
	T3	33.0	63.2	30.2
	T4	37.1	59.8	22.7
	T5	35.4	70.5	35.1
Syzigiumcumini	T1	64.4	77.3	12.9
	T2	65.1	72.1	7.0
	T3	62.9	82.7	19.8
	T4	61.8	82.4	21.2
	T5	61.6	76.8	15.2

Kalamavoor Modern Nursery Centre

The height data as of May 31, 2007, indicated that T3 (10 ml) generally produced better incremental growth across most species:

Species	Treatment	Avg Initial Height (cm)	Avg Final Height (cm)	Avg Growth (cm)
Azadirachta indica	T1	38.0	56.0	18.0
	T2	43.0	64.0	21.0
	T3	39.0	62.0	23.0
	T4	48.0	68.0	20.0
	T5	40.0	62.0	22.0
Pongamia pinnata	T1	32.0	42.0	10.0
	T2	28.0	47.0	19.0
	T3	33.0	47.0	14.0
	T4	32.0	49.0	17.0
	T5	35.0	50.0	15.0
Albizzia lebbeck	T1	48.0	58.0	10.0
	T2	49.0	59.0	10.0
	T3	51.0	65.0	14.0
	T4	56.0	70.0	14.0

	T5	55.0	68.0	13.0
Wrightia tinctoria	T1	46.0	56.0	10.0
	T2	40.0	47.0	7.0
	T3	50.0	57.0	7.0
	T4	46.0	54.0	8.0
	T5	36.0	39.0	3.0
Syzigiumcumini	T1	47.0	65.0	18.0
	T2	45.0	61.0	16.0
	T3	49.0	65.0	16.0
	T4	45.0	61.0	16.0
	T5	43.0	57.0	14.0

Valkaradu Modern Nursery Centre

In Valkaradu Modern Nursery Centre The highest growth for *Azadirachta indica* was observed with the T5 treatment (25 ml of vermiwash), showing an average growth of 10.8 cm. This suggests that higher dosages ofvermiwash may be beneficial for this species. And for *Pongamia pinnata,* The T4 treatment (20 ml) resulted in the highest growth (16.1 cm), indicating a preference for moderate to high dosages of vermiwash. For *Albizzia lebbeck* the T2 treatment (10 ml) was most effective, with an average growth of 30.1 cm, suggesting that lower dosages are optimal for this species. For *Wrightia tinctoria,* The T5 treatment (25 ml) again showed the best performance with an average growth of 35.1 cm, indicating a positive response to higher vermiwash concentrations. And for *Syzigiumcumini*The T3 treatment (15 ml) was most effective, with an average growth of 19.8 cm, suggesting a preference for moderate dosages. The overall trend of the results indicatehigher dosages of vermiwash (T4 and T5) generally resulted in better growth for most species, particularly *Azadirachta indica* and *Wrightia tinctoria* and Lower to moderate dosages (T2 and T3) were effective for species like *Albizzia lebbeck* and *Syzigiumcumini*.

Kalamavoor Modern Nursery Centre

In Kalamavoor Modern Nursery Centre the study revealed species-specific responses to vermiwash treatments among the tested plant species. *Azadirachta indica* exhibited

optimal growth under the T3 treatment (10 ml), with an average height of 23 cm, suggesting a preference for moderate dosages. Similarly, *Pongamia pinnata* responded best to the T4 treatment (15 ml), achieving 17 cm in growth, indicating that slightly higher vermiwash concentrations may be beneficial. *Albizzia lebbeck* showed comparable growth (14 cm) under both T3 (10 ml) and T4 (15 ml) treatments, reinforcing the trend favoring moderate dosages. In contrast, *Wrightia tinctoria* displayed the highest growth under the control (T1) condition, implying that vermiwash may not enhance its growth.*Syzigiumcumini* performed best with the T3 treatment (10 ml), reaching an average height of 16 cm, to show cause the effectiveness of moderate vermiwash application.

Overall, the findings suggest that moderate dosages (T3 and T4) generally promote better growth across most species.

Combined Analysis

Different species responded variably to vermiwash dosagesand however, The T3 treatment (10 ml) showed consistent performance across both locations and multiple species. Since T3 (10 ml) showed consistent performance across both locations and multiple species, It can be suggested as an optimal dosage for general application.

Recommendation

Based on the combined analysis of data from both experiments, it is recommended to use 10 ml of vermiwash per application for promoting the growth of tree seedlings in nurseries. This dosage has shown effective performance across various species and experimental conditions, supporting both growth and nursery management practices.