

See discussions, stats, and author profiles for this publication at:  
<https://www.researchgate.net/publication/279954318>

# Effect of VA Mycorrhiza on seedling growth and vigour of mango

Article · January 2014

CITATIONS

0

READS

24

5 authors, including:



[Muralidhara Bm](#)

Indian Institute of Horticultural Research

10 PUBLICATIONS 1 CITATION

[SEE PROFILE](#)



[Narayana Reddy](#)

Indian Institute of Horticultural Research

28 PUBLICATIONS 125 CITATIONS

[SEE PROFILE](#)



[dr.venugopalan Rangarajan](#)

Indian Institute of Horticultural Research

71 PUBLICATIONS 110 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



Collaboration with IIHR [View project](#)



MSc thesis [View project](#)

All content following this page was uploaded by [Muralidhara Bm](#) on 01 March 2017.

The user has requested enhancement of the downloaded file.

## EFFECT OF VA MYCORRHIZA ON SEEDLING GROWTH AND VIGOUR OF MANGO

B. M. Muralidhara, Y. T. N. Reddy, R. Venugopalan, H. J. Akshitha and M. K. Shivprasad

Scientist (P), NAARM, Rajendranagar, Hyderabad-500-030.

### ABSTRACT

The variety Bappakkai recorded the maximum seedling height (32.2 cm), girth (0.76 cm), leaf area (434.6 cm<sup>2</sup>), fresh weight (33.5 g), dry weight (12.4 g) and per cent of graftable seedlings (76.1 %). Maximum plant height (33.4 cm), girth (0.82 cm), number of leaves (18.4), leaf area (460.4 cm<sup>2</sup>), fresh weight (36.8 g), dry weight (12.8 g) and per cent of graftable seedlings (86.6 %) was noticed in treatment potting mixture (1:2:1) + cocopeat + VAM and minimum was observed in potting mixture (1:2:1).

**Key words:** Mango seedlings, VAM, potting mixture, coir pith, polyembryonic.

### Introduction

Application of bio-fertilizers improves the soil fertility and crop productivity in several crops through atmospheric nitrogen fixation, solubilizing inorganic and organic phosphorus and other nutrients, improving the seed germination, root proliferation, synthesis of plant growth substances and suppressing plant diseases (Verma, 1993; Subba Rao, 1995). The VA mycorrhizal inoculators are known to increase growth, yield, nitrogen fixation and absorption of mineral phosphorus (Yong *et al.*, 1984; Yamada *et al.*, 1987). Present investigation was undertaken to evaluate the effect of VA Mycorrhiza on seedling growth of mango.

### Material and methods

The investigation was carried out at Indian Institute of Horticultural Research, Bengaluru during 2011-12. Healthy, disease free, vigorously growing and uniform seedlings (45 days old) were transplanted to the polybags filled with different rooting media and bio-fertilizers. Factorial Complete Randomized Design was adopted. Two varieties (V<sub>1</sub>-Olour and V<sub>2</sub>-Bappakkai) were used as main treatment, and there were seven sub-treatments of different rooting media (T<sub>1</sub>-Regular potting mixture *i.e.*, red earth, FYM,

sand (2:1:1), T<sub>2</sub>-Regular potting mixture + coco peat (1:1), T<sub>3</sub>-Regular potting mixture + VAM (25 g/plant), T<sub>4</sub>-Regular potting mixture + coco peat + VAM (25g/plant), T<sub>5</sub>-Potting mixture *i.e.*, red earth, FYM, sand (1:2:1), T<sub>6</sub>-Potting mixture *i.e.*, red earth, FYM, sand (1:2:1)+VAM (25g/plant), T<sub>7</sub>-Potting mixture *i.e.*, red earth, FYM, sand (1:2:1)+ coco peat+VAM (25g/plant). The treatments were replicated thrice. The transplanted seedlings were maintained in polythene bags for four months and periodical observations were taken at monthly interval for plant height, number of leaves and stem girth. On 150 days after transplanting leaf area, fresh weight and dry weight of seedlings were recorded. The data were statistically analysed by using SAS-GLM (SAS, 2009) V 9.3 available at IIHR, Bengaluru.

### Results and discussion

Significant differences were observed (Table 1) among varieties and treatments for seedling height, number of leaves, stem girth and leaf area. At 150 days after transplanting, maximum seedling height (32.2 cm), seedling girth (0.76 cm) and leaf area (434.6 cm<sup>2</sup>) was recorded in variety Bappakkai. The maximum number of leaves were noticed in variety Olour (16.2). Among the treatments, the maximum seedling height (33.4 cm), number of leaves

(18.4), girth (0.82 cm) and leaf area (460.4 cm<sup>2</sup>) was recorded in Red earth + FYM + Sand(1:2:1) + coco peat + VAM (25g/plant). These results were in conformity with those of Geetha *et al.* (2007), Venkata Rao (2002).

The per cent of graftable seedlings and fresh and dry weight of seedling was maximum in variety Bappakkai (76.1%, 33.5 and 12.8 g respectively). The combination of potting mixture (1:2:1) + cocopeat + VAM (25g/plant) recorded the maximum graftable seedlings, fresh and dry weight of seedling (86.6 %, 36.8 and 12.8 g respectively), which was on par with regular potting mixture (2:1:1) + coco peat + VAM (25g/plant) (76.6 %, 32.3 and 11.5 g respectively).

## References

Geetha, R., Selvakumari, A. and Sujatha, K., (2007), *Plant Archives*, **7(2)**: 697.

Sas, (2009), "*Statistical analysis systems*",

SAS Institute.Inc., Cary, NC, USA. Subbarao, N.S., (1995), "*Soil microorganisms and plant growth*" (Third edition), Oxford and IBH Publishing Company. New Delhi. pp: 97-293.

Venkata Rao, (2002), "*Studies on nursery and propagation techniques in polyembryonic rootstocks of mango (Mangifera indica L.)*". M.Sc. (Hort.) Thesis, Univ. Agril. Sci., Bangalore.

Verma.L.N., (1993), "*Biofertilizer in Agriculture in: Organics in soil health and crop production*". Thampan, P.K. (Ed.) Peekay Tree Crops Development Foundation, Cochin, PP. 151-184.

Yamada, Y and Keela, M., (1987) *J. FAC. Agric. Kyushu, Univ.*, **31(4)**: 365.

Yong, C.C., Juang, T.C., and Guo, H.Y., (1984) *J. Agric. Assoc. China*, **128**: 29

**Table 1. Effect of media and VA mycorrhiza on seedling characters in different polyembryonic varieties of mango**

Treatments	Plant height		No. of leaves		Stem girth		Leaf area (cm <sup>2</sup> )	
	Varieties		Varieties		Varieties		Varieties	
	V <sub>1</sub>	V <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>
T <sub>1</sub>	19.8	29.0	15.4	13.4	0.60	0.70	187.7	361.8
T <sub>2</sub>	23.0	33.1	16.7	15.5	0.69	0.79	290.2	469.1
T <sub>3</sub>	21.9	32.4	16.2	14.4	0.67	0.77	244.8	416.5
T <sub>4</sub>	25.9	36.8	17.6	16.5	0.71	0.81	305.5	500.3
T <sub>5</sub>	17.0	26.9	12.7	11.7	0.55	0.65	147.1	340.7
T <sub>6</sub>	20.4	30.1	15.6	14.0	0.65	0.73	230.5	403.8
T <sub>7</sub>	29.7	37.1	19.3	17.4	0.76	0.88	370.5	550.3
<b>F-test</b>	T	V	T	V	T	V	T	V
<b>CD at 5%</b>	*	*	*	*	*	*	*	*
	1.64	0.87	1.37	0.73	0.041	0.022	43.56	23.2

\* Significant at 5% NS - Non significant DAT Days after transplanting

**Varieties:** V<sub>1</sub> Olour V<sub>2</sub> Bappakkai

### Treatments

T<sub>1</sub> Regular potting mixture i.e., red earth, FYM and sand (2:1:1)

T<sub>2</sub> Regular potting mixture + coco peat (1:1)

T<sub>3</sub> Regular potting mixture + VAM (25 g/plant)

T<sub>4</sub> Regular potting mixture + coco peat + VAM (25g/plant)

T<sub>5</sub> Potting mixture i.e., red earth, FYM and Sand (1:2:1)

T<sub>6</sub> Potting mixture i.e., red earth, FYM and sand (1:2:1) + VAM

T<sub>7</sub> Potting mixture i.e., red earth, FYM and Sand (1:2:1) + coco peat + VAM (25g/plant)

**Table 2. Effect of media and VA mycorrhiza on Per cent of graftable seedlings, fresh and dry weight in different polyembryonic varieties of mango**

Treatments	Per cent of graftable seedlings at 150 DAT		Fresh weight (g)		Dry weight (g)	
	Varieties		Varieties		Varieties	
	V <sub>1</sub>	V <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>
T <sub>1</sub>	33.3	60.0	17.0	26.9	5.7	10.0
T <sub>2</sub>	53.3	86.6	21.1	34.9	7.2	12.9
T <sub>3</sub>	53.3	80.0	18.9	32.6	7.1	12.3
T <sub>4</sub>	73.3	80.0	24.4	40.2	7.6	15.4
T <sub>5</sub>	26.6	53.3	13.9	23.5	7.8	8.7
T <sub>6</sub>	60.0	73.3	17.7	31.0	5.9	11.6
T <sub>7</sub>	73.3	100.0	28.2	45.5	9.6	16.1
<b>F-test</b>	T	V	T	V	T	V
	*	*	*	*	*	*
<b>CD at 5%</b>	11.22	5.99	3.52	1.88	0.25	1.34

\* Significant at 5% NS - Non significant DAT Days after transplanting

**Varieties:** V<sub>1</sub> Olour V<sub>2</sub> Bappakkai

**Treatments**

T<sub>1</sub> Regular potting mixture i.e., red earth, FYM and sand (2:1:1)

T<sub>2</sub> Regular potting mixture + coco peat (1:1)

T<sub>3</sub> Regular potting mixture + VAM (25 g/plant)

T<sub>4</sub> Regular potting mixture + coco peat + VAM (25g/plant)

T<sub>5</sub> Potting mixture i.e., red earth, FYM and Sand (1:2:1)

T<sub>6</sub> Potting mixture i.e., red earth, FYM and sand (1:2:1) + VAM

T<sub>7</sub> Potting mixture i.e., red earth, FYM and Sand (1:2:1) + coco peat + VAM (25g/plant)