

## EFFECT OF BIOFERTILIZER APPLICATION ON GROWTH OF NUTMEG (*MYRISTICA FRAGRANS* HOUTT.) SEEDLINGS

The use of biofertilizers has been reported to be beneficial for the cultivation of vegetable and cereals by many workers (Mehrotra and Lehari, 1971; Dewan and Rao, 1979; Venkateswarlu and Rao, 1983; Hadas and Okon, 1987). Not many reports are available on the effect of biofertilizer application on growth of plantation and orchard crops. The present study is on the effect of *Azospirillum* and *Azotobacter* inoculation on growth and establishment of nutmeg seedlings (*Myristica fragrans*) under pot culture conditions.

One native isolate each of *Azospirillum* and *Azotobacter* namely *Azospirillum brasiliense* (Isolate No.30) and *Azotobacter chroococcum* (Isolate No. 39B) along with an exotic culture of *Azospirillum brasiliense* from the Tamil Nadu Agricultural University (TNAU), Coimbatore and *Azotobacter chroococcum* from the Indian Agricultural Research Institute (IARI), New Delhi were used for this investigation. Nutmeg seedlings of uniform growth were obtained from the instructional farm of the College of Agriculture Vellayani, Thiruvananthapuram. One seedling each was transplanted to large earthen pots of 25 cm diameter filled with fresh potting mixture of FYM : sand : soil in 1:1:1 ratio after inoculating with respective carrier based *Azospirillum* and *Azotobacter* (population

density  $10^8$ /g CM) at the rate of 5g per kg of potting mixture in the top 10 cm soil. Control plants were grown without any biofertilizer application. Three replications were maintained for each treatment. The seedlings were grown for 15 months under regular irrigation. Observations on plant height, number of branches and leaves were taken at the time of transplanting and at 5, 10 and 15 months of seedling growth. A progressive increase in growth in terms of plant height, number of branches and leaves was observed in almost all the treatments. But these effects were more due to biofertilizer application especially from 10 month onwards. The height, number of branches and number of leaves of the plant in the treatment inoculated with the native isolate of *Azospirillum brasiliense* at 15 month after transplanting resulted in an increase of 66.4, 36.4 and 187.3 per cent respectively, over the control treatment (Table 1). The exotic culture of *A. brasiliense* from TNAU also showed similar but lower growth. In the case of *Azotobacter* treatments, the plant height and number of branches were more in the treatment with the native isolate of *Azotobacter chroococcum* and showed an increase of 47.5 and 9.9 per cent when compared to the control treatment (Table 1). The number of leaves produced at 15 months of plant growth was, however, more after inoculation with the exotic

Table 1. Effect of biofertilizer application on seedling growth in nutmeg\*

Treatment	At the time of planting			5th month			10th month			15 th month			% Increase		
	H	B	L	H	B	L	H	B	L	H	B	L	H	B	L
<i>A. brasiliense</i>															
Isolate No. 30	20.3	1	14	39	4	44	84.7	15	201	88.2	15	204	66.4	36.4	187.3
TN culture	23.9	1	15	31	4	44	55.3	12	131	60.2	12	145	13.2	9.9	104.2
<i>A. chroococcum</i>															
Isolate No. 39B	21.8	0	11	44	5	42	76.3	11	118	78.2	12	122	47.5	9.9	71.8
IARI culture	20.2	0	9	44	4	41	15.3	10	126	60.2	11	134	30.2	0.0	88.7
Control	22.9	0	11	37	4	41	51.3	11	63	53	11	71	0	0	0

\* Mean or 3 replications; H = Height (cm); B = Number of branches; L = Number of leaves

culture of *A. chroococcum* from IARI, New Delhi.

In general, the application of biofertilizer was found to be beneficial for the growth of nutmeg seedlings. Such an effect has been reported earlier in black pepper by Bopaiah and Khader (1989). It was also observed during this investigation that between the two types of diazotrophic

biofertilizers used, seedling growth response was more after treatment with *Azospirillum* especially with the native isolate of *A. brasilense*. This may be due to its better adaptation to acidic soil conditions and higher N fixing as well as phyto-hormone producing ability. Hence, it will be advantageous to use this type of biofertilizer for large-scale production of nutmeg seedlings.

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