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***Short communication***

# Response of nutmeg seeds to different nursery media

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Nutmeg (*Myristica fragrans* Houtt.) is one of the important tree spices of Kerala. Though commercial propagation of nutmeg is by vegetative method, saplings raised from seeds are important for rootstock purposes. The seeds after extraction are sown either immediately or not later than 3-4 days (Khandekar *et al.*, 6). However, the germination of nutmeg seeds is reported to be low (40-50%). Seeds treated with growth regulators had shown increased germination in nutmeg (Mathew, 7). Besides growth regulators, rooting media also play a vital role in seed germination and seedling growth of nutmeg. Khandekar *et al.* (6) suggested that rice bran, sand + rice bran and sand were the best media for maximum germination and seedling growth in nutmeg under coastal conditions of Maharashtra. Similarly, Baghel and Saraswat (1), and Baghel *et al.* (2) also found the influence of rooting media on the success of pomegranate cuttings. Keeping in view the influence of media in germination and seedling growth, the present investigation was carried out to study the effect of different media on seed germination, seedling growth and vigour of nutmeg with the help of locally available media under Kerala conditions.

The present investigation was carried out during 2007-2008 at Indian Institute of Spices Research Experimental Farm, Peruvannamuzhi in a completely randomized block design. The experiment consisted of 21 treatments (media) namely, $T_1$- soil: sand: FYM 3:1:1, $T_2$- soil: sand: FYM 2:1:1 (control), $T_3$- soil: sand: FYM 1:1:1, $T_4$- soil: granite: FYM 3:1:1, $T_5$- soil: granite: FYM 2:1:1, $T_6$- soil: granite: FYM 1:1:1, $T_7$- soil: sand: vermicompost 3:1:1, $T_8$- soil: sand: vermicompost 2:1:1, $T_9$-soil: sand: vermicompost 1:1:1, $T_{10}$- soil: granite: vermicompost 3:1:1, $T_{11}$- soil: granite: vermicompost 2:1:1, $T_{12}$- soil: granite: vermicompost 1:1:1, $T_{13}$- soil: coir dust: sand: FYM 1:1:1:1, $T_{14}$- soil: coir dust: granite: FYM 1:1:1:1, $T_{15}$- soil: coir dust: granite: vermicompost 1:1:1:1, $T_{16}$- soil: coir dust: sand: vermicompost 1:1:1:1, $T_{17}$- coir dust :granite: FYM 2:1:1, $T_{18}$- coir dust : sand: FYM 2:1:1, $T_{19}$- soil alone, $T_{20}$- granite alone, $T_{21}$- sand alone which were replicated thrice.

Tree ripe harvested nutmeg seeds collected from the IISR Experimental Farm were used for the present experiment. About 30 seeds were sown in first week of July in polythene bags of 20 cm × 15 cm size under each treatment. The sowing was done by keeping the seed in vertical position about 1 inch deep in different media as per treatments. The bags were irrigated immediately after sowing and repeated every day till final seeding emergence. Observations on germination, No. of seeds germinated per day and time taken for initial and final emergence were recorded. After the completion of germination the bags were irrigated once in 4 days and various growth characters of seedlings were recorded eight months after sowing the seeds from five randomly selected plants in each replication of a treatment. Based on the analysis method (Jackson, 5), the composition of soil granite, sand, coir pith, vermicompost and FYM is as follows:

| Treatment | pH | N (mg/kg) | P (mg/kg) | K (mg/kg) |
|---|---|---|---|---|
| Soil | 4.91 | 29.6 | 11.5 | 289.7 |
| Granite | 5.6 | 40 | 30 | 856.4 |
| Sand | 5.93 | 23.8 | 65.67 | 136.7 |
| FYM | 6.38 | 114.72 | 52.5 | 350.0 |
| Coir dust | 4.1 | 220 | 10 | 971.0 |
| Vermicompost | 6.49 | 490.8 | 271.0 | 329.5 |

Data presented in Table 1 indicate that there was a significant difference observed in the days taken for germination among all the treatments and the earliest germination was recorded in $T_{16}$ (42.10 days) which was on par with $T_{13}$ (44.32 days) (Table 1). The germination percentage was highest in $T_{16}$ (86.67%), which was significantly different from all other treatments. The treatments $T_{16}$ was found to be the best followed by $T_{13}$ with regard to germination behaviour as these media have suitable physical properties (bulk density 0.76 g/cc and 0.82 for $T_{16}$ and $T_{13}$ respectively), and good water holding capacity (64 and 59.5% for $T_{16}$ and $T_{13}$ respectively).

Significant differences were observed among the different treatments with regard to seedling growth characters and maximum seedling height was observed in $T_{16}$ (29.84 cm) which was on par with $T_{15}$ (28.79 cm) (Table 1). Similarly, number of leaves and root length were maximum in $T_{16}$ (21.14 & 18.14 cm respectively) which were on par with $T_{13}$ (20.36 and 127.91 cm respectively). Plant biomass (shoot and root

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**Table 1.** Response of nutmeg seeds to different rooting media.

| Treatment | Days taken for germination | Germination (%) | Seedling height (cm) | No. of leaves | Root length (cm) | Shoot dry wt. (g) | Root dry wt. (g) | Vigour Index-I (cm) | Vigour Index-II (g) |
|---|---|---|---|---|---|---|---|---|---|
| $T_1$- soil: sand: FYM 3:1:1 | 49.33 | 40.13 | 24.42 | 14.72 | 14.68 | 7.12 | 2.55 | 1632.89 | 400.50 |
| $T_2$- soil: sand: FYM 2:1:1 (control) | 47.81 | 40.28 | 24.38 | 13.67 | 14.04 | 6.49 | 2.29 | 2667.18 | 662.90 |
| $T_3$- soil: sand: FYM 1:1:1 | 48.60 | 40.26 | 20.80 | 11.22 | 11.14 | 6.13 | 1.26 | 2365.63 | 519.18 |
| $T_4$- soil: granite: FYM 3:1:1 | 56.75 | 40.16 | 15.61 | 9.89 | 10.64 | 5.97 | 0.98 | 2925.13 | 814.44 |
| $T_5$- soil: granite: FYM 2:1:1 | 55.16 | 46.67 | 15.29 | 8.83 | 9.51 | 5.81 | 0.89 | 4140.23 | 1086.84 |
| $T_6$- soil: granite: FYM 1:1:1 | 56.62 | 40.37 | 15.05 | 9.75 | 9.29 | 5.50 | 0.82 | 3878.65 | 1040.14 |
| $T_7$- soil: sand: vermicompost 3:1:1 | 48.67 | 73.33 | 22.21 | 12.58 | 14.32 | 6.58 | 1.58 | 1475.08 | 308.03 |
| $T_8$- soil: sand: vermicompost 2:1:1 | 45.78 | 60.32 | 18.30 | 14.39 | 10.97 | 5.97 | 0.92 | 1693.79 | 352.27 |
| $T_9$- soil: sand: vermicompost 1:1:1 | 48.12 | 53.33 | 19.54 | 13.08 | 11.03 | 6.13 | 1.13 | 1612.70 | 258.65 |
| $T_{10}$- soil: granite: vermicompost 3:1:1 | 46.14 | 51.16 | 21.22 | 13.70 | 11.76 | 6.26 | 1.01 | 1589.11 | 273.95 |
| $T_{11}$- soil: Granite: vermicompost 2:1:1 | 46.76 | 53.33 | 19.80 | 12.14 | 10.73 | 5.35 | 0.88 | 816.37 | 109.61 |
| $T_{12}$- soil: Granite: vermicompost 1:1:1 | 48.86 | 46.67 | 14.34 | 10.92 | 8.85 | 4.92 | 0.82 | 1163.06 | 162.28 |
| $T_{13}$- soil: coir dust: sand: FYM 1:1:1:1 | 44.32 | 80.32 | 25.36 | 20.36 | 17.91 | 8.63 | 3.91 | 858.77 | 133.33 |
| $T_{14}$- soil: coir dust: granite: FYM 1:1:1:1 | 45.78 | 73.33 | 25.12 | 17.89 | 14.73 | 7.96 | 2.79 | 1235.66 | 183.46 |
| $T_{15}$- soil: coir dust: granite: vermicompost 1:1:1:1 | 45.33 | 80.24 | 28.79 | 20.41 | 15.86 | 8.15 | 2.86 | 769.59 | 144.32 |
| $T_{16}$- soil: coir dust: sand: vermicompost 1:1:1:1 | 42.10 | 86.67 | 29.84 | 21.14 | 18.14 | 8.72 | 4.23 | 835.80 | 107.90 |
| $T_{17}$- coir dust : granite: FYM 2:1:1 | 52.50 | 33.67 | 14.78 | 9.33 | 8.81 | 2.81 | 0.79 | 426.03 | 51.54 |
| $T_{18}$- coir dust : sand: FYM 2:1:1 | 53.15 | 20.21 | 14.16 | 9.72 | 9.13 | 3.19 | 0.87 | 596.87 | 101.61 |
| $T_{19}$- soil alone | 50.83 | 26.67 | 21.28 | 11.39 | 11.56 | 5.44 | 0.96 | 1145.22 | 176.65 |
| $T_{20}$- granite alone | 53.75 | 33.33 | 20.83 | 15.75 | 11.07 | 6.22 | 1.86 | 1812.15 | 440.51 |
| $T_{21}$- sand alone | 50.47 | 33.33 | 14.83 | 6.42 | 8.85 | 3.13 | 0.83 | 719.59 | 120.99 |
| CD at 5% | 2.74 | 2.96 | 2.30 | 1.37 | 1.36 | 0.31 | 0.28 | 85.43 | 34.22 |

dry weight) and seedling vigour index I and II on length ( VII) and weight basis ( VIII) were maximum in the media $T_{16}$ which was significantly different from all other treatments (Table 1). Thus, the combined application of vermicompost and coir dust in the treatment $T_{16}$ showed significant effect on germination, seedling growth, plant biomass and vigour index probably due to the synergistic effect of both the factors in improving the physical conditions of the media and nutritional factors (Sahni *et al.*, 9). Coir dust when amended with organic manure like vermicompost suits as the best media as coir dust has good physical characteristics (Garcia and Daverede, 4). Thus, based on the results of this study it can be concluded that the treatment $T_{16}$ (soil: sand: coir dust: vermicompost 1:1:1:1) showed better results that supports seed germination and seedling growth in nutmeg. This result is akin to the findings of Priyadarshani *et al.* (8) and Campos Mota *et al.* (3) who suggested that since coir dust is low in nutrients when mixed with vermicompost provides a better growth medium for plant establishment. Moreover, the air filled porosity (AFP), easily available water (EAW) and aeration of vermicompost were not at the recommended level which in turn limit the root growth and lowered the water holding capacity and therefore the medium with vermicompost and coir dust is more suitable than vermicompost alone because of the better physical properties and enhanced nutrient level.

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