Effect of potting media on per cent germination and growth of Jackfruit (*Artocarpus heterophyllus* L.) grafts cv. Konkan prolific

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Abstract

Among the tropical fruits, Jackfruit (*Artocarpus heterophyllus* L.) is an important underutilized fruit and often called the poor man’s fruit because of its affordability and availability in large quantities during the season. The jackfruit trees are raised by seeds and therefore the progenies do not breed true to type and show many variations. Hence, vegetative propagation methods are must in jackfruit. For this standardization of its germination of seedlings and vegetative propagation techniques plays an important role. Hence, experiment proposed entitled “Effect of potting media on per cent germination and growth of Jackfruit (*Artocarpus heterophyllus* L.) grafts cv. Konkan Prolific” was conducted at Fruit Crop Nursery of Department of Horticulture, Dr. Balasahab Sawant Konkan Krishi Vidyapeeth, Dapoli during 2012-2013. In this experiment eight potting media were tried in Randomized Block Design and replicated at thrice. Among the different potting media Soil + FYM (1:1) media gave higher seed germination, seedling growth and vigour up to 30 days.

Keywords: Potting media, germination, jackfruit grafts and Konkan prolific

Introduction

Jackfruit, *Artocarpus heterophyllus* L. belonging to family Moraceae is one of the most popular and widely grown, evergreen fruit tree. Jackfruit produces heavier yields than any other tree species and bears largest known edible fruit weighing around 35-50 kg each. This is one of the underexploited nutritious fruit crop indigenous to the rainforests of Western Ghats of India (Reddy *et al.*, 2004) [9]. The full commercial exploitation of these existing jackfruit plants has not been possible because of their heterozygous in nature. There is a wide variation with respect to fruit size, shape, quality, season of bearing and harvesting. The jackfruit trees are raised by seeds and therefore the progenies do not breed true to type and show many variations. The success of nursery is largely depends on healthy rootstock for grafting. Potting media plays an important role in seed germination. Media not only acts as a growing place but also good source of nutrient for plant growth (Ramteke *et al.*, 2015) [8]. Hence, it is of prime importance to standardize the suitable potting media for commercial production of jackfruit seedling for grafting.

Material and Methods

The experiment was conducted at Fruit Crop Nursery, Department of Horticulture, College of Agriculture Dapoli, Dist. Ratnagiri during the year 2012-2013 with different potting media viz., T_1_ - Soil + FYM (1:1), T_2_ - Soil + FYM (2:1), T_3_ - Soil + FYM (3:1), T_4_ - Soil + Vermicompost (1:1), T_5_ - Soil + Vermicompost (2:1), T_6_ - Soil + Vermicompost (3:1), T_7_ - Soil + Sand + FYM (1:1:1) and T_8_ - Soil + Sand + Vermicompost (1:1:1). Uniform sized, fully ripe fruits were selected. The seeds were extracted, washed with clean water and dried in shade for a day. The soaking of seeds carried out for 24 hours in clean water before sowing. The different combinations of soil, sand, FYM and vermicompost as per the treatment combinations were used for filling the polythene bags of 15 x 20 cm in size. Seeds of jackfruit were sown in individual polythene bags up to the depth of 2-2.5 cm. Per cent seed germination at fifteen and thirty days after sowing, were recorded. Germination percentage were calculated by dividing the total number of germinated seeds by the total number of seeds sown and
Result and Discussions

Effect of potting media on germination percentage of jackfruit: Data pertaining to the effect of potting media on per cent seed germination of jackfruit are presented in table 1. At 15 days after sowing, per cent seed germination was significantly varied from 24.67 to 46.00 per cent among all the potting media treatments. Significantly the highest (46.00%) seed germination was observed in treatment T5 which was at par with treatments T1, T2, T3, T5 and T6. Significantly lowest (24.67%) seed germination was observed in treatment T3. Similarly, at 30 days after sowing, per cent seed germination was significantly varied from 71.00 to 90.00 per cent, among all the potting media treatments. Significantly highest (90.00%) seed germination was observed in treatment T7 and it was at par with treatments T4, T5, T6, T7 and T5. Significantly lowest (71.00%) seed germination was observed in treatment T3. However, the present findings are confirmative with results reported by Hande (1987) [4] in Jamun and Gawankar et al., (2019) [3] in jackfruit seed germination in various potting media.

Effect of potting media on plant height (cm) of jackfruit grafts cv. Konkan Prolific: The data on the growth of jackfruit grafts raised in different media are presented in table 2. At 15 days after grafting, height of jackfruit grafts was non-significantly varied from 18.38 to 20.96 cm among all the potting media. Data present in Table 2 revealed that at 30 days after grafting, height of jackfruit grafts was significantly varied from 20.12 to 22.81 cm among all the potting media. Significantly highest (22.81 cm) graft height was observed in treatment T5 which was at par with treatments T1, T3, T7 and T5. However, the lowest (20.12 cm) graft height was observed in treatment T4. The similar findings were accordance with Gawankar et al., (2019) [3] in jackfruit.

Effect of potting media on girth at collar region (cm) of jackfruit grafts cv. Konkan Prolific: Data present in table 2 showed that, at 15 days after grafting, girth at collar region of jackfruit grafts was non-significantly varied from 1.07 to 1.27 cm among all the potting media. Similarly, at 30 days after grafting, girth at collar region of jackfruit grafts was non-significantly varied from 1.17 to 1.34 cm among all the potting media.

Effect of potting media on number of leaves of jackfruit grafts cv. Konkan Prolific: The data pertaining to number of leaves per plant due to allotted treatments at various growth stages are presented in table 2. Data showed that, at 15 days after grafting, numbers of leaves of jackfruit grafts were non-significantly varied from 1.30 to 2.40 among all the potting media. Similarly, at 30 days after grafting, numbers of leaves of jackfruit grafts were non significantly varied from 2.13 to 3.53 among all the potting media.

Table 1: Effect of potting media on per cent seed germination of jackfruit.

| Treatments | 15 Days After Sowing | 30 Days After Sowing |
|------------|----------------------|----------------------|
| T1         | 38.00 (38.05)        | 84.00 (66.83)        |
| T2         | 32.00 (34.31)        | 76.00 (61.41)        |
| T3         | 37.33 (37.65)        | 82.00 (64.96)        |
| T4         | 40.67 (39.61)        | 89.00 (70.64)        |
| T5         | 24.67 (29.51)        | 71.00 (57.44)        |
| T6         | 26.67 (31.00)        | 76.00 (60.78)        |
| T7         | 46.00 (42.70)        | 90.00 (71.58)        |
| T8         | 33.33 (35.15)        | 79.00 (62.73)        |
| Mean       | 34.83 (287.98)       | 80.87 (516.38)       |
| SIG        | SIG                  | SIG                  |
| SEM ±      | 3.29                 | 3.49                 |
| C.D. at 5% | 9.98                 | 10.57                |

(Statistical analysis is based on the transformed values of the per cent germination).

Table 2: Effect of potting media on plant height (cm), Girth at collar region (cm), number of leaves and dry matter (g) of jackfruit grafts cv. Konkan Prolific

| Treatments | Plant height (cm) | Girth (cm) at collar region | Number of leaves | Dry matter (g) |
|------------|-------------------|-----------------------------|------------------|---------------|
|            | 15 Days After     | 30 Days After                | 15 Days After    | 30 Days After |
|            | Graffing          | Graffing                    | Graffing         | Graffing      |
| T1         | 19.83             | 22.33                       | 1.27             | 1.34          |
| T2         | 20.96             | 22.81                       | 1.19             | 1.28          |
| T3         | 18.38             | 20.52                       | 1.10             | 1.21          |
| T4         | 19.13             | 20.12                       | 1.19             | 1.31          |
|            |                   |                             | 1.30             | 2.33          |
|            |                   |                             | 3.10             | 2.90          |

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*669*
|   | T1  | T2  | T3  | T4  | T5  | T6  | T7  | T8  |
|---|-----|-----|-----|-----|-----|-----|-----|-----|
| Ts | 18.42 | 20.72 | 1.07 | 1.17 | 1.30 | 2.13 | 2.30 |
| T6 | 20.01 | 22.16 | 1.15 | 1.21 | 2.40 | 2.57 | 2.37 |
| T7 | 19.01 | 22.54 | 1.25 | 1.33 | 1.80 | 3.50 | 2.10 |
| T8 | 19.48 | 21.65 | 1.30 | 1.21 | 1.50 | 2.13 | 2.30 |
| Range | 18.38 | 20.96 | 1.07 | 1.27 | 1.17 | 1.34 | 1.30-2.40 | 2.13-3.53 | 2.10-4.00 |
| Mean | 19.40 | 21.61 | 1.16 | 1.25 | 1.69 | 3.50 | 2.10 |
| 'E' test | NS | SIG | NS | NS | NS | NS | SIG |
| SEm ± | 0.65 | 0.39 | 0.06 | 0.07 | 0.37 | 0.44 | 0.02 |
| C.D. at 5% | - | 1.17 | - | - | - | - | 0.06 |

### Treatment details

| T1 | Soil + FYM (1:1) | T3 | Soil + Vermicompost (2:1) |
|----|----------------|----|--------------------------|
| T2 | Soil + FYM (2:1) | T6 | Soil + Vermicompost (3:1) |
| T4 | Soil + FYM (3:1) | T7 | Soil + Sand + FYM (1:1:1) |
| T8 | Soil + Vermicompost (1:1) | T8 | Soil + Sand + Vermicompost (1:1:1) |

### Conclusion

Thus, from the present investigation, it could be concluded that T1 Soil + FYM (1:1) potting media had shown better results in per cent seed germination and all the growth parameters of jackfruit grafts up to 30 days age followed by T7 Soil + Sand + FYM (1:1:1).

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