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Performance of cashew (*Anacardium occidentale* L.) graft under various media Cv. vengurla-4

SK Ghumare, RT Bhingarde, RG Khandekar, NH Khobargade and SB Thorat

Abstract
The present investigation was conducted at Nursery No.1, College of Horticulture, Dr. B.S. Konkan Krishi Vidyapeeth, Dapoli, Dist. Ratnagiri during the year 2018-20. The experiment was executed in randomized block design with eight treatments and three replications. The eight treatments consist of T_1 - Soil + FYM (3:1), T_2 - Soil + FYM + Vermicompost (1:1:1), T_3 - Soil + FYM + Cocopeat (1:1:1), T_4 - Soil + FYM + Rice husk (1:1:1), T_5 - Soil + FYM + Sand (1:1:1), T_6 - Soil + Vermicompost + Sand (1:1:1), T_7 - Soil + Vermicompost + Cocopeat (1:1:1), T_8 - Soil + Vermicompost + Rice husk (1:1:1). The result revealed that the survival and morphological parameters were observed periodically and found to be significantly influenced by the different potting media. The potting medium of Soil + FYM + Rice husk (1:1:1) i.e., treatment T_4 recorded the highest percentage of survival (95.56%), per cent increase in height (47.11%), length of root (30.34 cm).

Keywords: Vermicompost, potting medium, FYM, rice husk etc.

Introduction
Cashew (*Anacardium occidentale* L.) belongs to the family Anacardiaceae. Cashew is native to Eastern Brazil and introduced into India by the Portuguese during the 16th Century. In the beginning, cashew was mainly considered as a crop for afforestation and soil binding to check erosions and has now become one of the major dollar earning crop of India (Johnson, 1973) [11].

Initially cashew plants were seen in and around region of Kerala and Goa in West Coast and later the cashew spread to remaining areas of East Coast. It was first grown in the gardens of Cochin and in the Malabar Coast, and Cochin served as dispersal point for the cashew in India and perhaps South-East Asia as well (Johnson, 1973) [11]. India is the first country to exploit international trade of cashew kernels in the early part of the 20th century, also the first one to initiate research in the early 1950's.

India is the country that nourished this crop and made it a commodity of international trade. Cashew is an important nut crop that provides food, employment and hard currency to many in developing nations. Of all nuts, cashew ranks third after almond and hazelnut in commercial importance. Traditionally, cashew has been an important crop in the coastal region (Western and Eastern) of the country but has been recently spreading to non-traditional areas as well. There is great scope to expand area under cashew by about 7.1 lakh ha in both traditional and non-traditional areas including Gujarat, Jharkhand, North Eastern Hilly (NEH) Regions, Andaman and Nicobar Islands, Chhattisgarh and plains region of Karnataka in addition to the present area (Bhat *et al*., 2010) [4].

The crop has been growing from sea level to an altitude of 600 m to 700 m. It is observed that closeness to sea with its regulating effect on climate is a favourable factor for cashew cultivation. Also, cashew is found successfully grown at 1000 km away from the sea coast in India, Tanzania and Brazil (Mandal, 2007) [14]. Therefore, cashew has adapted to seasonally wet and dry tropical climate and possesses the capacity to grow and yield satisfactorily on well-drained, light-texture soils with minimal inputs. This explains adaptability of the crop to a wide ecological difference of the tropical environment (Aliyu and Hammed, 2008) [3]. Further, cashew nut is generally planted in the wasteland, marginal degraded soil with poor fertility status.

Cashew is essentially a tropical crop, best in the warm, moist and typically tropical climate, with a well-defined dry season of at least 4-5 months. Cashew is a drought tolerant plant which is considered as a dollar earning crop in waste lands. The mean maximum and minimum temperature for growing cashew should be approximately 34 ^{o}C and 18 ^{o}C, respectively.

Cashew can be grown under varied rainfall conditions ranging from 500 to 4000 mm and can withstand long period of low humidity or dry spell. It is sensitive to high relative humidity over 80 per cent for a long period.

Standardization of nursery techniques is the first step for raising successful plantations. Potting mixture is the only source of supplying adequate nutrients to the seedling and thus it plays an important role in nursery rising, as it affects supply of water and nutrients for the growth and other physiological process. The potting medium traditionally used in India consist of sand, soil, and farm yard manure in a 2:1:1 ratio (Rai, 1990) [18]. The expenditure on nursery alone takes a major portion of plantation cost. The cost can, however, be reduced by evolving a cheap, suitable and desire nursery practice for raising seedling in nursery container by vegetative propagation or by seed.

As the establishment and survival of the planting stock in the field are mainly dependent on the production of good quality planting stock which is dependent on the suitable potting mixture as well as artificial supply of nutrients. Thus, the study was conduct for standardization of potting mixture for enhancement of seedling growth in cashew under nursery condition at Konkan region.

Material and Methods

The details of the material used, the method adopted and the observations taken during the present investigation have been detailed mentioned as below.

Experimental site

The experiment was conducted in the Poly Tunnel for initial 30 days after transferring the cashew grafts into the respective medium (from 19 February 2019 to 21 March 2019) and from 31 days to 180 days (22 March 2019 to 22 August 2019) grafts were shifted to natural open field conditions at Nursery No.1, College of Horticulture, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Dist. Ratnagiri (M.S.), India.

Place and weather conditions during experiment

Dapoli represents a tropical climate having average humidity 78% and warm climate throughout the year with equable temperature and well expressed three seasons *viz*., summer (March to May), Rainy (June to October) and Winter (November to February). Dapoli is situated on the west coast of Maharashtra State at 17074" N latitude and 73018" E longitude with the altitude of 240 meter above mean sea level and 8 km from Arabian Sea. The climate is warm and humid from May to October and slight cooler from November to April, while from March to May the day temperature is high.

Variety

Cashew nut Cv. Vengurla 4 variety of cashew nut is a cross between Midnapur red x Vetore 56, released by Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli in 1982, was used.

Materials used for preparation of potting media:

1. Polybags: Polybags of size 10'' x 14'' were procured from the local market were used for re-potting of the cashew grafts.
2. Soil: The red-coloured lateritic soils found in the Konkan region were used in making the respective potting media with respective proportion.
3. FYM and Vermicompost: The well decomposed FYM and Vermicompost were procured from the Dairy Farm, Department of Animal Husbandry and Dairy Science, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli.
4. Cocopeat: Cocopeat was procured from the local market and disinfected by using Trichoderma as a fungicide.
5. Sand: Sand was obtained from the creek nearby Harnai Port, Dapoli in the month of January.
6. Rice husk: The rice husk was obtained from the Rice Mill, Jalgaon, Tal. Dapoli, Dist. Ratnagiri.

Preparation of potting media

The media for potting was prepared by mixing the soil, FYM, cocopeat, sand, vermicompost and rice husk as per the requirement of the respective treatment in respective proportion. During preparation of potting medium, Trichoderma @ 10g/100 kg of potting medium was well mixed in medium as a fungicide to avoid the fungal growth in the polybag.

Transplanting (Rebagging): The 6 months old softwood grafts of cashew Cv. Vengurla 4 were transplanted or re-bagged in the poly bag (10″×14″ size) by using the respective medium and kept under poly tunnel for initial 30 days and thereafter kept in open field condition for further next 150 days. During transplanting the grafts were planted in half filled poly bags without disturbing the root ball and then filled and covered with the medium as per the treatments.

Layout of experiment: Thirty number of grafts were treatment wise arranged in each replication in a randomized block design (RBD) under the Poly tunnel of dimension 18 x 3.40 x 2.40 m3 (length x width x height) during initial 30 days as well as in the open field condition for next 150 days.

After care: The cashew grafts kept in poly tunnel during initial 30days after transplanting and in open field condition (from 31 to 150 days) were watered regularly at an interval of three days and two days, respectively. The sprouts emerging below the graft union were removed at 15 days interval regularly.

Observations recorded: Following observations are recorded during the present investigation by using the standard methods as

Survival (%): The survival of grafts was recorded at an interval of 30 days started from 30 DAT up to six months after transplanting i.e., 180 days.

Plant height (cm): The height (cm) of graft was measured with wooden scale from collar region up to the apical end of the shoot at the time of transplanting and at an interval of 30 days.

Root length (cm): Length of tap root (in centi-meter) from three selected grafts from each replication of all treatment combinations were measured with the help of measuring scale at the end of the experiment and average was worked out.

Statistical analysis

The morphological observations and analytical values obtained during the course of study were subjected to statistical analysis by following the procedure pertinent to Randomized Block Design analysis as given by Panse and Sukhatme (1995) [16].

Results and Discussion

In the present investigation an attempt has been made to study the 'Effect of Potting Media on Survival and Growth of Cashew Grafts (*Anacardium occidentale* L.) cv. Vengurla 4' with an aim to finding out the best medium for Cashew Grafts Cv. Vengurla-4 from the available cheap resources of organic component (like FYM, Vermicompost, rice husk and cocopeat) as well as sand used along with soil.

The effect of different potting media on survival, plant height and root length attributes of cashew grafts as well as nutrient status of different potting media was studied. The observations of this study were analysed statistically, described and contemplated to discuss the variations observed with an attempt to establish the 'effect and cause' relationship in the light of available evidences and literature.

Effect of different potting media on survival of rebagged cashew grafts

The survival percentage of cashew grafts as influenced by different potting media varied from 93.33 to 98.89% at 30 DAT, 92.22 to 97.78% at 60 DAT, 90.00 to 96.67% at 90 DAT, 87.78 to 96.67% at 120 DAT, 85.56 to 95.56% at 150 DAT and 83.33 to 95.56% at 180 DAT (Table 1).

At 30 DAT, the survival percentage in descending order is as follows:

T7 > T4 > T2 > T8 > T3 > T6 > T1 > T5

At 30 DAT, significantly highest survival percentage of 98.89% was observed in the treatment T7 i.e., Soil + Vermicompost + Cocopeat (1:1:1), which was at par with T4 i.e., Soil + FYM + Rice husk (1:1:1) 98.88%, T2 i.e., Soil + FYM + Vermicompost (1:1:1) 98.87%, T8 i.e., Soil + Vermicompost + Rice husk (1:1:1) 97.78% and T3 i.e., Soil + FYM + Cocopeat (1:1:1) 96.67%. The potting medium Soil + FYM + Sand (1:1:1) (treatment T5) recorded the lowest survival percentage (93.33%), which was at par with T1 i.e., Soil + FYM (3:1).

At 60 DAT, the survival percentage in descending order is as follows:

T8 > T2 > T7 > T4 > T3 > T6 > T1 > T5

At 60 DAT, significantly highest survival percentage of 97.78% was observed in the treatment T8 i.e., Soil + Vermicompost + Rice husk (1:1:1), which was at par with T2 i.e., Soil + FYM + Vermicompost (1:1:1) 97.77%, T7 i.e., Soil + Vermicompost + Cocopeat (1:1:1) 96.67% and T4 i.e., Soil + FYM + Rice husk (1:1:1) 96.66%; while potting medium Soil + FYM + Sand (1:1:1) (treatment T5) recorded the lowest survival percentage (92.22%).

At 90 DAT the survival percentage in descending order is as follows:

T8 > T4 > T2 > T7 > T3 > T1 > T6 >T5

At 90 DAT, significantly highest survival percentage of 96.67% was observed in the treatment T8 i.e., Soil + Vermicompost + Rice husk (1:1:1), which was at par with T4 i.e., Soil + FYM + Rice husk (1:1:1) 96.66%, T2 i.e., Soil + FYM + Vermicompost (1:1:1) 96.66%, T7 i.e., Soil + Vermicompost + Cocopeat (1:1:1) 95.56%, T3 i.e., Soil + FYM + Cocopeat (1:1:1) 94.45% and T1 i.e., Soil + FYM (3:1) 94.44%; while potting medium Soil + FYM + Sand (1:1:1) (treatment T5) recorded the lowest survival percentage (90.00%).

At 120 DAT the survival percentage in descending order is as follows:

T4 > T2 > T8 > T7 > T3 > T1 > T6 > T5

At 120 DAT, significantly highest survival percentage of 96.67% was observed in the treatment T4 i.e., Soil + FYM + Rice husk (1:1:1), which was at par with T2 i.e., Soil + FYM + Vermicompost (1:1:1) 96.65%, T8 i.e., Soil + Vermicompost + Rice husk (1:1:1) 95.56% and T7 i.e., Soil + Vermicompost + Cocopeat (1:1:1) 95.55%; while potting medium Soil + FYM + Sand (1:1:1) (treatment T5) recorded the lowest survival percentage (87.78%).

At 150 DAT the survival percentage in descending order is as follows:

T4 > T2 > T7 > T8 > T3 > T1 > T6 > T5

At 150 DAT, significantly highest survival percentage of 95.56% was observed in the treatment T4 i.e. Soil + FYM + Rice husk (1:1:1), which was at par with T2 i.e. Soil + FYM + Vermicompost (1:1:1) 95.55%, T7 i.e., Soil + Vermicompost + Cocopeat (1:1:1) 94.44%, T8 i.e. Soil + Vermicompost + Rice husk (1:1:1) 94.43% and T3 i.e. Soil + FYM + Cocopeat (1:1:1) 94.42%; while potting medium Soil + FYM + Sand (1:1:1) (treatment T5) recorded the lowest survival percentage (85.56%). At 180 DAT the survival percentage in descending order is as follows:

T4 > T2 > T8 >T7 > T3 > T1 > T6 > T5

At 180 DAT, significantly highest survival percentage of 95.56% was observed in the treatment T4 i.e., Soil + FYM + Rice husk (1:1:1), which was at par with T2 i.e., Soil + FYM + Vermicompost (1:1:1) 94.44%, T8 i.e., Soil + Vermicompost + Rice husk (1:1:1) 94.33% and T7 i.e., Soil + Vermicompost + Cocopeat (1:1:1) 93.99%; while potting medium Soil + FYM + Sand (1:1:1) (treatment T5) recorded the lowest survival percentage (83.33%).

The highest survival percentage of cashew grafts especially from 120 DAT to 180 DAT was noted in the treatment T4 i.e., Soil + FYM + Rice husk (1:1:1) which may be due to favorable medium for better growth of the graft. Rice husk is reported to be rich in silicon and also known to be a source of triacontanol, cellulose and lignin which can exert the influence so that better graft survival and healthy grafts were obtained (Hwang and Chandra, 1997) [9]. According to Ebaid and El-refaee (2007) [6] the use of rice husk as an organic fertilizer, might have played a vital role in improving soil physical condition thus enhancing efficiency of grafted plant for nutrient absorption. Similar finding was reported by Gawankar (2019) [7] for jackfruit in Soil + Vermicompost + Rice husk (2:1:1) medium Rajput *et al.* (2019) [19] also observed that the medium containing for the Soil + FYM + Vermicompost + Rice husk 1:1:1:1 with 1" Cocopeat at top had shown better survival percentage in nutmeg under Konkan conditions. The close scrutiny of data indicated that the survival percentage of cashew grafts as influenced by different potting medium decreasing from 30 DAT to 180 DAT. Similar trend of decrease in survival percentage of cashew grafts as influenced by different potting medium was also reported by Khedkar (2019) [12].

Table 1: Effect of different potting media on Survival Percentage of cashew grafts cv. Vengurla-4

Tr.	Treatments	Survival percentage of cashew grafts at an interval of 30 days					
		30 DAT	60 DAT	90 DAT	120 DAT	150 DAT	180 DAT
T1	Soil + FYM (3:1) – Control	94.44(76.36)	94.44(76.36)	94.44(76.36)	94.43(76.35)	93.33(75.03)	93.33(75.03)
T2	Soil + FYM + Vermicompost (1:1:1)	98.87(83.90)	97.77(81.41)	96.66(79.47)	96.65(79.45)	95.55(77.82)	94.44(76.36)
T3	Soil + FYM + Cocopeat (1:1:1)	96.67(79.49)	95.56(77.84)	94.45(76.37)	94.44(76.36)	94.42(76.34)	93.47(75.19)
T4	Soil + FYM + Rice husk (1:1:1)	98.88(83.93)	96.66(79.47)	96.66(79.47)	96.66(79.47)	95.56(77.84)	95.56(77.84)
T5	Soil + FYM + Sand (1:1:1)	93.33(75.03)	92.22(73.80)	90.00(71.57)	87.78(69.54)	85.56(67.67)	83.33(65.90)
T6	Soil + Vermicompost + Sand (1:1:1)	95.56(77.84)	94.44(76.36)	92.22(73.80)	90.00(71.57)	87.78(69.54)	86.67(68.59)
T7	Soil + Vermicompost + Cocopeat (1:1:1)	98.89(83.95)	96.67(79.49)	95.56(77.84)	95.55(77.82)	94.44(76.36)	93.99(75.81)
T8	Soil + Vermicompost + Rice husk (1:1:1)	97.78(81.43)	97.78(81.43)	96.67(79.49)	95.56(77.84)	94.43(76.35)	94.33(76.22)
	Mean	96.81	95.69	94.58	93.89	92.64	91.39
	S.Em±	0.41	0.42	0.61	0.56	0.53	0.52
	C.D. at +5%	1.25	1.28	1.86	1.69	1.61	1.58

(Figures in parenthesis indicate arcsine transformed value)

Effect of different potting media on growth of cashew grafts

Total Plant Height (cm)

The plant height of cashew grafts as influenced by different potting media varied at various observational periods ranged from 29.01 to 31.09 cm, 31.82 to 34.40 cm, 33.62 to 37.20 cm, 37.09 to 40.00cm, 38.27 to 42.47 cm, 39.41 to 44.27 cm and 41.42 to 47.11 cm at 0 DAT, 30 DAT, 60 DAT, 90 DAT, 120 DAT, 150 DAT and 180 DAT, respectively (Table 2).

The plant height of cashew grafts at various observational periods indicated that the plant height increased over the period of observations from 0 DAT to 180 DAT, but the significant difference in plant height due to various potting medium were observed from 120 DAT to 180 DAT, thereby signifies the role of potting medium in overall establishment of grafts over a long period of time as indicated through the grafts height.

At 30 DAT the plant height in descending order is as follows:

T4 > T8 > T1 > T2 > T7 > T3 > T5 > T6

At 30 DAT, the maximum per cent increase in plant height of (10.63%) was observed in the treatment T4 i.e., Soil + FYM + Rice husk (1:1:1), while potting medium Soil + Vermicompost + Sand (1:1:1) (treatment T6) recorded the minimum per cent increase in plant height (6.37%). There was no significant difference in plant height at 30 DAT.

At 60 DAT the plant height in descending order is as follows:

T4 > T2 > T1 > T8 > T7 > T3 > T6 > T5

At 60 DAT, the maximum per cent increase in plant height of (19.64%) was observed in the treatment T4 i.e., Soil + FYM + Rice husk (1:1:1), while potting medium Soil + FYM + Sand (1:1:1) (treatment T5) recorded the minimum per cent increase in plant height (12.09%). There was no significant difference in plant height at 60 DAT.

At 90 DAT, the plant height in descending order is as follows:

T4 > T8 > T1 > T2 > T7 > T3 > T5 > T6

At 90 DAT, the maximum per cent increase in plant height of (28.64%) was observed in the treatment T4 i.e., Soil + FYM + Rice husk (1:1:1), while potting medium Soil + Vermicompost + Sand (1:1:1) (treatment T6) recorded the minimum per cent increase in plant height (23.98%). There was no significant difference in plant height at 90 DAT.

At 120 DAT the plant height in descending order is as follows:

T4 > T8 > T1 > T3 > T2 > T7 > T5 > T6

At 120 DAT, significantly maximum plant height of cashew grafts (42.47 cm) was obtained in treatment T4 i.e. Soil + FYM + Rice husk (1:1:1) which was at par with the treatments T8 i.e. Soil + Vermicompost + Rice husk (1:1:1) 40.78cm, T1 i.e. Soil + FYM (3:1) 40.62cm, T3 i.e. Soil + FYM + Cocopeat (1:1:1) 40.60cm and T2 i.e. Soil + FYM + Vermicompost (1:1:1) 40.47cm. Significantly minimum plant height at 120 DAT of cashew grafts was found in treatment T6 (38.27cm). At 150 DAT the plant height in descending order is as follows:

T4 > T8 > T2 > T3 > T1 > T7 > T6 > T5

At 150 DAT, significantly maximum plant height of cashew grafts (44.27 cm) was obtained in treatment T4 i.e. Soil + FYM + Rice husk (1:1:1) which was at par with the treatments T8 i.e. Soil + Vermicompost + Rice husk (1:1:1) 43.84cm, T2 i.e. Soil + FYM + Vermicompost (1:1:1) 43.24cm, T3 i.e. Soil + FYM + Cocopeat (1:1:1) 42.61cm and T1 i.e. Soil + FYM (3:1) 42.57cm. Significantly minimum plant height at 150 DAT of cashew grafts was found in treatment T5 (39.41cm).

At 180 DAT the plant height of transplanted cashew grafts in descending order is as follows:

T4 > T8 > T2 > T3 > T1 > T7 > T6 > T5

At 180 DAT, significantly maximum plant height of cashew grafts (47.11 cm) was obtained in treatment T4 i.e., Soil + FYM + Rice husk (1:1:1), which was at par with the treatments T8 i.e., Soil + Vermicompost + Rice husk (1:1:1) 46.28cm, T2 i.e., Soil + FYM + Vermicompost (1:1:1) 45.37cm, T3 i.e., Soil + FYM + Cocopeat (1:1:1) 44.63cm and T1 i.e., Soil + FYM (3:1) 44.59 cm. Significantly minimum plant height at 180 DAT of cashew grafts was found in treatment T5 (41.42cm).

In the present investigation, the treatment T4 i.e., Soil + FYM + Rice husk (1:1:1) showed significantly maximum plant height of cashew grafts from 30 DAT to 180 DAT indicating the superiority of the potting medium over the other potting medium combinations particularly in case of plant height. In this connection, Purwantoro (2016) [17] suggested rice husk as natural silica fertilizer due to high organic matter and silica content, while Chaudhary (1996) [5] advised FYM as a main source of organic matter for the supply of essential minerals for the plant growth.

Similar finding was reported by Gawankar (2019) [19] in jackfruit with media containing Soil + Vermicompost + Rice

husk (2:1:1) media.

Similarly, initial non-significant result of potting medium in relation to plant height of cashew grafts and thereafter statistically significant role of potting medium in establishment of grafts indicated through its height were also reported by Khedkar (2019) [12] under Konkan conditions.

Physiological activity in successful grafts produced new shoots and leaves. More number of shoots and leaves triggered the process of photosynthesis, which resulted in accumulation of energy. Simultaneously availability of moisture, nutrient through medium (Ikram *et al*., 2012) [10] resulted in more sprouting followed by increasing morphological characters like height, girth and number of leaves. Medium pH ranged near neutrality promote higher uptake of nutrient in medium containing FYM, rice husk and cocopeat which was of also supported by retention moisture and proper aeration. Hence more increase in height was obtained in medium containing FYM, cocopeat and rice husk in proper proportion. Increase in plant height of cashew grafts Cv. Vengurla-4 with the potting medium of Soil + FYM + Rice husk + Cocopeat (1:1:1:1) was recorded by Khedkar (2019) [12] under Konkan conditions. Similar findings were reported by Aatla (2011) [1] in red soil + FYM + sand (1:1:1) for mango grafts, Panchal *et al*. (2014) [15] in soil + cocopeat + FYM (1:1:1) for khirni seedling, Kurava (2016) in soil + FYM (1:1) medium for mango.

Table 2: Effect of different potting media on Total plant height of cashew grafts cv. Vengurla-4

Tr.	Treatments	Total plant height of cashew grafts (cm) at an interval of 30 days						
		0 DAT	30 DAT	60 DAT	90 DAT	120 DAT	150 DAT	180DAT
T1	Soil + FYM (3:1) – Control	30.94(0.00)	33.59(8.58)	36.13(16.79)	38.72(25.15)	40.62(31.29)	42.57(37.60)	44.59(44.11)
T2	Soil + FYM + Vermicompost (1:1:1)	30.45(0.00)	33.34(9.50)	36.21(18.92)	38.58(26.71)	40.47(32.93)	43.24(42.02)	45.37(49.00)
T3	Soil + FYM + Cocopeat (1:1:1)	30.06(0.00)	32.15(6.94)	34.74(15.57)	37.55(24.91)	40.60(35.06)	42.61(41.76)	44.63(48.46)
T4	Soil + FYM + Rice husk (1:1:1)	31.09(0.00)	34.40(10.63)	37.20(19.64)	40.00(28.64)	42.47(36.58)	44.27(42.37)	47.11(51.50)
T5	Soil + FYM + Sand (1:1:1)	29.99(0.00)	31.9(46.49)	33.62(12.09)	37.14(23.83)	38.29(27.67)	39.41(31.38)	41.42(38.10)
T6	Soil + Vermicompost + Sand (1:1:1)	29.91(0.00)	31.82(6.37)	33.69(12.64)	37.09(23.98)	38.27(27.93)	39.52(32.11)	41.82(39.80)
T7	Soil + Vermicompost + Cocopeat (1:1:1)	29.01(0.00)	32.33(11.42)	34.95(20.47)	38.09(31.30)	39.23(35.23)	40.29(38.86)	42.92(47.93)
T8	Soil + Vermicompost + Rice husk (1:1:1)	30.44(0.00)	33.93(11.48)	35.77(17.52)	39.05(28.27)	40.78(33.97)	43.84(44.02)	46.28(52.04)
	Mean	30.24	32.94	35.29	38.28	40.09	41.97	44.27
	S.Em±	0.61	1.28	0.98	0.97	0.80	1.09	1.14
	C.D. at 5%	NS	NS	NS	NS	2.44	3.31	3.47

(Value in parenthesis indicates per cent increase)

Root length (cm)

The data regarding the effect of different potting media on root length have been presented in the Table 3.

At the end of the sixth month, the increase in root length of cashew grafts followed the order

T4 > T3 > T5 > T2 > T7 > T6 > T1 > T8

At the end of the sixth month, the root length was significantly influenced by the different potting medium treatments. The highest root length (30.34 cm) was recorded in the treatment T4 (i.e., soil + FYM + rice husk 1:1:1). The lowest root length (15.22 cm) was recorded in T8 (i.e., Soil + Vermicompost + Rice husk 1:1:1). In the present investigation, among the various potting media combinations medium containing Soil + FYM + Rice husk (1:1:1) has shown better results for root growth. This may be due to organic amendment in potting mixture which improved the physical property like aeration, water holding capacity, drainage, pH that encourage better root growth and nutrient absorption in favorable media. Similar finding was reported by Abhirami *et al*. (2010) [2] with Soil + Coir dust + Sand + Vermicompost (1:1:1:1) in nutmeg, Gholap and Polara (2015) in mango having media containing Soil + FYM + leaf mould (1:1:1). Rajput *et al*. (2019) [19] observed maximum root length (39.80 cm) in treatment of Soil + FYM + Vermicompost + Rice husk 1:1:1:1 with 1" Cocopeat at top indicating 198.46 per cent increase in length over initial root length in nutmeg.

Table 3: Effect of different potting media on root length of cashew grafts cv. Vengurla-4

Tr.	Treatments	Root length (cm) at 180 DAT
T1	Soil + FYM (3:1) – Control	16.17
T2	Soil + FYM + Vermicompost (1:1:1)	23.47
T3	Soil + FYM + Cocopeat (1:1:1)	27.09
T4	Soil + FYM + Rice husk (1:1:1)	30.34
T5	Soil + FYM + Sand (1:1:1)	25.25
T6	Soil + Vermicompost + Sand (1:1:1)	18.05
T7	Soil + Vermicompost + Cocopeat (1:1:1)	21.18
T8	Soil + Vermicompost + Rice husk (1:1:1)	15.22
	Mean	22.10
	S.E.±	0.55
	C.D. at 5%	1.67

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