

## Original Research Article

# Effect of Potting Media, Vermiwash and Cattle Urine on Survival and Growth of Jackfruit Grafts cv. Konkan Prolific

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## ABSTRACT

The present investigation entitled "Studies on effect of potting media, vermiwash and cattle urine on survival and growth of jackfruit grafts cv. Konkan Prolific" was conducted at Fruit Crop Nursery of Department of Horticulture, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli during 2012-2013. In this experiment total nine treatments of vermiwash and cattle urine drenching and spraying along with control and three potting media were tried with factorial randomized block design and replicated at thrice. From the study, it was observed that, vermiwash 10% spraying had shown better growth in respect of increased plant height, girth at collar region, leaf number and dry matter. While in interaction effect, Soil + Sand + FYM (1:1:1) with vermiwash 10% spraying had shown the better effect on most of the growth parameters of jackfruit grafts and it was followed by Soil + Sand + FYM (1:1:1) with vermiwash 50% drenching up to 180 days.

### Keywords

Jackfruit grafts,  
Potting media,  
Vermiwash and  
Cattle urine

## Introduction

Jackfruit trees show great variability due to its tendency of being naturally cross pollinated. However, over a period of time, large number of cultivars in different parts have been identified and tried for cultivation in different parts of India. Jackfruit can be grown in almost all types of soil provided the subsoil drainage system is suitable. The tree is even suitable for wastelands, dry and semiarid conditions. The full commercial exploitation of these existing jackfruit plants has not been possible because of their heterozygous 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. Hence vegetative propagation methods are must in jackfruit. For this standardization of its vegetative propagation technique plays an important role. Epicotyl and softwood grafting in this crop are simple and rapid methods of vegetative propagation with the success varying from 90 per cent (Kolekar, 1979) to 95 per cent (Harnekar, 1980) and 33.33 per cent (Amin, 1974) to 80 per cent (Kolekar, 1979), respectively. The survival of grafts and other aspects of the problem are closely linked with the nutritious properties of potting media. Hence, there is an urgent need to consider effect of potting media on

growth of jackfruit grafts. Vermiwash and cattle urine a liquid are applied to crops as a foliar spray to boost crop growth. (Uma Maheshwari, 2002 and Baghel and Singh, 1985). Vermiwash serves as a source of phosphates, sulphates, chlorides of potassium, sodium, magnesium, sulphur, iron and ammonia. Cattle urine also serves as the potential bio-regulator. Thus, vermiwash and cattle urine play a key role in concept of organic farming. The variety 'Konkan prolific' of jackfruit is developed by Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Dist. Ranagiri (Maharashtra). The fruit of this variety is medium size (8 to 9 kg), skin colour is green when immature and greenish yellow to brownish yellow when ripe. The inside of the fruit contains the edible, sweet, aromatic, crispy bulbs. To test the possibility of using different potting media, vermiwash and cattle urine on survival and vigorous growth of jackfruit grafts cv. Konkan Prolific, the research was proposed.

### **Materials 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., S<sub>1</sub>- Soil + FYM (1:1), S<sub>2</sub>- Soil + FYM (2:1) and S<sub>3</sub>- Soil + Sand + FYM (1:1:1) and vermiwash and cattle urine drenching as well as spraying viz., T<sub>1</sub>- Control, T<sub>2</sub>- Vermiwash 25 % drenching, T<sub>3</sub>- Vermiwash 50 % drenching, T<sub>4</sub>- Vermiwash 10 % spraying, T<sub>5</sub>- Vermiwash 20 % spraying, T<sub>6</sub>- Cattle urine 25 % drenching, T<sub>7</sub>- Cattle urine 50 % drenching, T<sub>8</sub>- Cattle urine 10 % spraying, T<sub>9</sub>- Cattle urine 20 % spraying in randomized block design with three replications. Jackfruit nursery grafts of variety Konkan Prolific were selected randomly for investigation. In all, twenty five grafts were placed per treatment in each replication, out of which five number of

jackfruit nursery grafts were selected randomly per treatment in each replication for further study. Series of cattle urine and vermiwash concentrations were prepared for drenching and spraying as per treatment details. Thirty days after sowing, per cent germination was recorded. Observations on growth of five grafts randomly selected in each treatment were recorded 30 days up to 180 days after grafting. The data in the present investigation was statistically analyzed by the method suggested by Panse and Sukhatme (1985).

### **Results and Discussions**

#### **Survival**

The per cent survival is one of the important characters while establishment of nursery. The interaction effect between potting media, vermiwash and cattle urine significantly varied as shown in Table 1. At 180 days, the highest per cent survival was recorded in treatment S<sub>3</sub>T<sub>3</sub> (76.33 %) which was at par with S<sub>1</sub>T<sub>3</sub>, S<sub>2</sub>T<sub>4</sub>, S<sub>2</sub>T<sub>7</sub>, S<sub>2</sub>T<sub>8</sub>, S<sub>3</sub>T<sub>4</sub>, S<sub>3</sub>T<sub>6</sub> and S<sub>3</sub>T<sub>7</sub> treatments under study. The lowest per cent survival was observed in S<sub>1</sub>T<sub>5</sub> (49.00 %).

#### **Plant height (cm)**

Data pertaining to the effect of potting media, vermiwash and cattle urine on height of jackfruit nursery grafts are presented in Table 2. At 30 days, the tallest plant at this stage was produced by interaction S<sub>3</sub>T<sub>4</sub> (39.74 cm), which was at par with S<sub>3</sub>T<sub>1</sub> (36.07 cm) and was superior over rest of treatments under study. The lowest plant height was recorded in interaction S<sub>1</sub>T<sub>8</sub> (20.34 cm). At 60 and 90 days, the highest plant height was recorded in interaction S<sub>3</sub>T<sub>4</sub> (53.58 and 67.68 cm), which was at par with S<sub>3</sub>T<sub>1</sub> (51.00 and 59.60 cm). The lowest plant was produced by interaction S<sub>2</sub>T<sub>5</sub> (21.91 and 22.43 cm). At 120, 150 and 180 days, the highest plant height was recorded in S<sub>3</sub>T<sub>4</sub> (81.78, 95.63 and 108.40

cm), which was significantly superior over all the interaction under study. The lowest plant height was recorded in S<sub>2</sub>T<sub>5</sub> (24.96, 26.48 and 27.25 cm). Similar findings are in accordance with results reported by Mankar *et al.*, (2006) in China aster, Rajamani *et al.*, (2007) and Sathish *et al.*, (2007) in turmeric.

### **Girth at collar region (cm)**

Data regarding the effect of potting media, vermiwash and cattle urine on girth at collar region of jackfruit nursery grafts are presented in Table 3. At 30 days Significantly the highest (1.81 cm) girth at collar region was observed in S<sub>3</sub>T<sub>4</sub>, which was at par with S<sub>1</sub>T<sub>2</sub>, S<sub>1</sub>T<sub>4</sub>, S<sub>1</sub>T<sub>6</sub>, S<sub>2</sub>T<sub>6</sub>, S<sub>2</sub>T<sub>8</sub>, S<sub>3</sub>T<sub>1</sub>, S<sub>3</sub>T<sub>2</sub> and S<sub>3</sub>T<sub>5</sub> treatment combinations whereas, lowest (1.11 cm) girth at collar region of jackfruit grafts was observed in S<sub>3</sub>T<sub>6</sub> treatment combination. At 60 days, significantly highest (2.06 cm) girth at collar region was observed in S<sub>2</sub>T<sub>8</sub>, which was at par with S<sub>1</sub>T<sub>2</sub>, S<sub>1</sub>T<sub>4</sub>, S<sub>1</sub>T<sub>6</sub>, S<sub>1</sub>T<sub>9</sub>, S<sub>3</sub>T<sub>2</sub>, S<sub>3</sub>T<sub>4</sub> and S<sub>3</sub>T<sub>5</sub> treatment combinations and significantly superior over all other treatment combinations. However, the lowest (1.28 cm) girth at collar region of jackfruit grafts was observed in S<sub>3</sub>T<sub>6</sub> treatment combination. At 90 and 120 days, significantly the highest (2.36 and 2.62 cm) girth at collar region was observed in S<sub>2</sub>T<sub>8</sub>, which was at par with S<sub>1</sub>T<sub>2</sub>, S<sub>1</sub>T<sub>4</sub>, S<sub>1</sub>T<sub>6</sub>, S<sub>1</sub>T<sub>9</sub>, S<sub>3</sub>T<sub>2</sub> and S<sub>3</sub>T<sub>4</sub> treatment combinations and significantly superior over all other treatment combinations. However, the lowest (1.38 and 1.49 cm) girth at collar region of jackfruit grafts was observed in S<sub>3</sub>T<sub>7</sub> treatment combination. At 150 and 180 days, significantly the highest (2.90 and 3.17 cm) girth at collar region was observed in S<sub>2</sub>T<sub>8</sub>, which was at par with S<sub>1</sub>T<sub>2</sub>, S<sub>1</sub>T<sub>4</sub>, S<sub>1</sub>T<sub>6</sub>, S<sub>1</sub>T<sub>7</sub>, S<sub>1</sub>T<sub>9</sub>, S<sub>2</sub>T<sub>1</sub>, S<sub>2</sub>T<sub>7</sub>, S<sub>3</sub>T<sub>2</sub> and S<sub>3</sub>T<sub>4</sub> treatment combinations and significantly superior over all other treatment combinations. However, the lowest (1.56 and 1.62 cm) girth at collar region of

jackfruit grafts was observed in S<sub>2</sub>T<sub>5</sub> treatment combination. The similar findings are contradictory with results reported by Juvekar *et al.*, (2006) in chilli and Rajamani *et al.*, (2007) in turmeric.

### **Number of leaves**

Data on number of leaves are presented in Table 4 and showed that, the interaction effect between potting media, vermiwash and cattle urine were non significantly varied from 2.33 (S<sub>1</sub>T<sub>8</sub>) to 7.67 (S<sub>3</sub>T<sub>1</sub>) at 30 days, 7.00 (S<sub>3</sub>T<sub>6</sub>) to 17.00 (S<sub>3</sub>T<sub>1</sub>) and (S<sub>1</sub>T<sub>4</sub>) at 60 days, 10.00 (S<sub>2</sub>T<sub>8</sub>) to 22.67 (S<sub>1</sub>T<sub>7</sub>) at 90 days, 13.67 (S<sub>2</sub>T<sub>8</sub>) to 30.33 (S<sub>1</sub>T<sub>4</sub>) and (S<sub>1</sub>T<sub>7</sub>) at 120 days, 17.33 (S<sub>2</sub>T<sub>8</sub>) to 38.33 (S<sub>1</sub>T<sub>4</sub>) at 150 days and 21.67 (S<sub>2</sub>T<sub>8</sub>) to 44.33 (S<sub>1</sub>T<sub>4</sub>) and (S<sub>1</sub>T<sub>7</sub>) at 180 days after grafting. The present findings are in accordance with results reported by Mankar *et al.*, (2006) in china aster, Rajamani *et al.*, (2007) and Sathish *et al.*, (2007) in turmeric.

### **Number of shoots**

Number of shoots is an important factor to develop better framework of plants after establishment in orchard and helps to cover the space vertically as well as horizontally. It was observed that the emergence of shoots of jackfruit grafts were started from 60 days onward. Data on number of shoots are presented in table 5 and revealed that the interaction effect between potting media, vermiwash and cattle urine were non-significant from 60 days up to 180 days after grafting. The maximum number of shoots were recorded by treatment combination S<sub>3</sub>T<sub>1</sub> (1.33) at 60 days, (2.33) at 90 days, (3.33) at 120 days, (4.33) at 150 days and (5.33) at 180 days after grafting.

### **Dry matter (g)**

The overall functioning of plant ultimately leads to the formation and progressive

accumulation of the dry matter in the plant body. All physiological processes both catabolic and anabolic result into a net balance or accumulation of dry matter. Thus, the growth of plant is nothing but the progressive accumulation of dry matter. The data regarding the dry matter (g) as affected by potting media, vermiwash and cattle urine were presented under Table 6 and revealed that, the interaction effect between potting media, vermiwash and cattle urine was non significantly varied at 180 days in case of dry matter of jackfruit grafts.

From the present findings it was concluded that, Soil + Sand + FYM (1:1:1) potting

media had shown better results in per cent survival and further most of the growth parameters of jackfruit grafts and it was followed by Soil + FYM (1:1). Further, in different vermiwash and cattle urine treatments; vermiwash 10% spraying had shown better effect on most of the growth parameters of grafts upto 180 days. While, in interaction effect, Soil + Sand + FYM (1:1:1) with vermiwash 10% spraying had shown the better effect on most of the growth parameters of jackfruit grafts and it was followed by Soil + Sand + FYM (1:1:1) with vermiwash 50% drenching upto 180 days.

**Table.1** Effect of potting media, vermiwash and cattle urine on per cent survival of jackfruit grafts cv. Konkan Prolific (at 180 days)

Per cent survival (at 180 days)				
Treatments	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
T <sub>1</sub>	<b>59.00</b> (50.20)	<b>59.00</b> (50.21)	<b>57.33</b> (49.23)	<b>58.44</b> (49.88)
T <sub>2</sub>	<b>53.00</b> (46.72)	<b>57.00</b> (49.04)	<b>60.67</b> (51.18)	<b>56.89</b> (48.98)
T <sub>3</sub>	<b>72.00</b> (58.14)	<b>63.33</b> (52.75)	<b>76.33</b> (60.90)	<b>70.55</b> (57.26)
T <sub>4</sub>	<b>57.00</b> (49.04)	<b>72.67</b> (58.49)	<b>70.00</b> (56.81)	<b>66.55</b> (54.78)
T <sub>5</sub>	<b>49.00</b> (44.43)	<b>50.33</b> (45.19)	<b>59.33</b> (50.45)	<b>52.88</b> (46.69)
T <sub>6</sub>	<b>55.33</b> (48.07)	<b>57.33</b> (49.22)	<b>72.00</b> (58.07)	<b>61.55</b> (51.79)
T <sub>7</sub>	<b>52.67</b> (46.53)	<b>67.33</b> (55.17)	<b>68.00</b> (55.59)	<b>62.66</b> (52.43)
T <sub>8</sub>	<b>50.33</b> (45.19)	<b>71.00</b> (57.43)	<b>67.33</b> (55.19)	<b>62.88</b> (52.61)
T <sub>9</sub>	<b>62.00</b> (51.96)	<b>63.00</b> (52.54)	<b>72.00</b> (58.08)	<b>65.66</b> (54.20)
<b>Mean</b>	<b>63.00</b> (48.92)	<b>70.04</b> (52.23)	<b>75.25</b> (55.06)	
	<b>'F' test</b>		<b>SEm ±</b>	<b>CD at 5%</b>
<b>S</b>	<b>SIG</b>		<b>0.82</b>	<b>2.33</b>
<b>T</b>	<b>SIG</b>		<b>1.42</b>	<b>4.03</b>
<b>S×T</b>	<b>SIG</b>		<b>2.46</b>	<b>6.98</b>

(Figures in the parentheses indicate the arc sin values)

**Table.2(a)** Effect of potting media, vermiwash and cattle urine on plant height (cm) of jackfruit grafts cv. Konkan Prolific

Plant height (cm)												
	At 30 days				At 60 days				At 90 days			
Treatments	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	31.07	31.08	59.60	40.58
T <sub>1</sub>	25.40	24.98	36.07	<b>28.81</b>	28.07	28.08	51.00	<b>35.71</b>	36.17	33.02	29.73	<b>32.96</b>
T <sub>2</sub>	27.90	26.52	24.68	<b>26.36</b>	32.30	29.85	27.24	<b>29.79</b>	39.43	28.20	42.74	<b>36.79</b>
T <sub>3</sub>	28.73	24.47	28.40	<b>27.20</b>	34.30	26.35	35.44	<b>32.03</b>	42.10	32.63	67.68	<b>47.47</b>
T <sub>4</sub>	29.00	24.17	39.74	<b>30.97</b>	35.43	29.30	53.58	<b>39.43</b>	40.16	22.43	33.10	<b>31.89</b>
T <sub>5</sub>	24.14	21.37	27.07	<b>24.19</b>	32.05	21.91	30.17	<b>28.04</b>	28.15	36.54	25.77	<b>30.15</b>
T <sub>6</sub>	24.13	27.37	22.13	<b>24.54</b>	27.00	32.00	23.93	<b>27.64</b>	36.94	32.23	37.10	<b>35.42</b>
T <sub>7</sub>	27.54	25.53	28.03	<b>27.03</b>	32.39	28.73	32.60	<b>31.24</b>	24.42	31.50	33.80	<b>29.90</b>
T <sub>8</sub>	20.34	23.83	25.72	<b>23.29</b>	22.44	27.62	29.79	<b>26.61</b>	36.93	37.12	26.47	<b>33.50</b>
T <sub>9</sub>	27.02	26.60	22.37	<b>25.33</b>	32.33	31.93	24.40	<b>29.55</b>	31.07	31.08	59.60	<b>40.58</b>
Mean	<b>26.02</b>	<b>24.98</b>	<b>28.25</b>		<b>30.70</b>	<b>28.42</b>	<b>34.24</b>		<b>35.04</b>	<b>31.64</b>	<b>39.55</b>	
	'F' test	SEm ±	CD at 5%		'F' test	SEm ±	CD at 5%		'F' test	SEm ±	CD at 5%	
S	<b>SIG</b>	<b>0.47</b>	<b>1.35</b>		<b>SIG</b>	<b>0.73</b>	<b>2.08</b>		<b>SIG</b>	<b>0.96</b>	<b>2.73</b>	
T	<b>SIG</b>	<b>0.82</b>	<b>2.33</b>		<b>SIG</b>	<b>1.27</b>	<b>3.60</b>		<b>SIG</b>	<b>1.67</b>	<b>4.74</b>	
S×T	<b>SIG</b>	<b>1.42</b>	<b>4.04</b>		<b>SIG</b>	<b>2.20</b>	<b>6.24</b>		<b>SIG</b>	<b>2.89</b>	<b>8.20</b>	

S-potting media, T-vermiwash and cattle urine treatments, S X T- interaction effect

**Table.2(b)** Effect of potting media, vermiwash and cattle urine on plant height (cm) of jackfruit grafts cv. Konkan Prolific

Plant height (cm)												
	At 120 days				At 150 days				At 180 days			
Treatments	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	31.07	31.08	59.60	40.58
T <sub>1</sub>	33.83	34.13	64.80	<b>44.25</b>	37.00	37.25	67.83	<b>47.36</b>	39.80	40.32	71.13	<b>50.41</b>
T <sub>2</sub>	40.00	36.36	33.14	<b>36.5</b>	43.87	39.61	35.60	<b>39.69</b>	47.70	43.00	38.20	<b>42.96</b>
T <sub>3</sub>	44.53	30.00	50.02	<b>41.51</b>	49.73	31.72	57.10	<b>46.18</b>	54.67	33.55	64.15	<b>50.79</b>
T <sub>4</sub>	47.60	35.91	81.78	<b>55.09</b>	54.00	39.31	95.63	<b>62.98</b>	60.57	42.63	108.40	<b>70.53</b>
T <sub>5</sub>	48.14	24.96	36.13	<b>36.41</b>	55.85	26.48	39.10	<b>40.47</b>	64.05	27.25	42.03	<b>44.44</b>
T <sub>6</sub>	28.33	40.95	27.67	<b>32.31</b>	30.52	45.49	29.44	<b>35.15</b>	31.70	49.67	31.43	<b>37.60</b>
T <sub>7</sub>	41.49	35.73	41.57	<b>39.59</b>	46.13	39.10	46.10	<b>43.77</b>	50.66	42.53	50.67	<b>47.95</b>
T <sub>8</sub>	26.38	35.27	37.92	<b>33.19</b>	28.43	39.14	41.95	<b>36.50</b>	30.37	42.99	45.96	<b>39.77</b>
T <sub>9</sub>	41.72	42.43	28.50	<b>37.55</b>	46.49	47.56	30.50	<b>41.51</b>	51.25	52.85	32.63	<b>45.57</b>
Mean	<b>38.22</b>	<b>34.86</b>	<b>44.61</b>		<b>43.56</b>	<b>38.07</b>	<b>49.25</b>		<b>47.86</b>	<b>41.28</b>	<b>53.84</b>	
	'F' test	SEm ±	CD at 5%		'F' test	SEm ±	CD at 5%		'F' test	SEm ±	CD at 5%	
S	<b>SIG</b>	<b>1.33</b>	<b>3.76</b>		<b>SIG</b>	<b>1.42</b>	<b>4.12</b>		<b>SIG</b>	<b>1.70</b>	<b>4.81</b>	
T	<b>SIG</b>	<b>2.30</b>	<b>6.52</b>		<b>SIG</b>	<b>2.45</b>	<b>6.15</b>		<b>SIG</b>	<b>2.94</b>	<b>8.33</b>	
S×T	<b>SIG</b>	<b>3.98</b>	<b>11.29</b>		<b>SIG</b>	<b>7.23</b>	<b>12.25</b>		<b>SIG</b>	<b>5.09</b>	<b>14.43</b>	

S-potting media, T-vermiwash and cattle urine treatments, S X T- interaction effect

**Table.3(a)** Effect of potting media, vermiwash and cattle urine on girth at collar region (cm) of jackfruit grafts cv. Konkan Prolific

Girth at collar region (cm)												
Treatments	At 30 days				At 60 days				At 90 days			
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
T <sub>1</sub>	1.25	1.52	1.65	<b>1.47</b>	1.34	1.70	1.70	<b>1.58</b>	1.45	1.90	1.78	<b>1.71</b>
T <sub>2</sub>	1.75	1.45	1.73	<b>1.64</b>	2.04	1.69	1.90	<b>1.88</b>	2.30	1.90	2.10	<b>2.10</b>
T <sub>3</sub>	1.54	1.38	1.57	<b>1.50</b>	1.64	1.45	1.71	<b>1.60</b>	1.74	1.57	1.83	<b>1.71</b>
T <sub>4</sub>	1.65	1.27	1.81	<b>1.58</b>	1.87	1.34	1.98	<b>1.73</b>	2.04	1.41	2.25	<b>1.90</b>
T <sub>5</sub>	1.40	1.31	1.64	<b>1.45</b>	1.52	1.37	1.78	<b>1.56</b>	1.66	1.43	1.90	<b>1.66</b>
T <sub>6</sub>	1.70	1.71	1.11	<b>1.51</b>	2.01	1.77	1.28	<b>1.69</b>	2.20	1.83	1.42	<b>1.82</b>
T <sub>7</sub>	1.45	1.58	1.18	<b>1.40</b>	1.74	1.78	1.29	<b>1.60</b>	1.99	1.99	1.38	<b>1.79</b>
T <sub>8</sub>	1.32	1.77	1.54	<b>1.54</b>	1.38	2.06	1.65	<b>1.70</b>	1.44	2.36	1.73	<b>1.84</b>
T <sub>9</sub>	1.56	1.39	1.17	<b>1.37</b>	1.80	1.45	1.30	<b>1.52</b>	2.04	1.52	1.42	<b>1.66</b>
Mean	<b>1.51</b>	<b>1.49</b>	<b>1.49</b>		<b>1.70</b>	<b>1.62</b>	<b>1.62</b>		<b>1.87</b>	<b>1.77</b>	<b>1.76</b>	
	'F' test	SEm ±	CD at 5%		'F' test	SEm ±	CD at 5%		'F' test	SEm ±	CD at 5%	
S	NS	<b>0.03</b>	-		NS	<b>0.03</b>	-		NS	<b>0.04</b>	-	
T	<b>SIG</b>	<b>0.05</b>	<b>0.13</b>		<b>SIG</b>	<b>0.06</b>	<b>0.16</b>		<b>SIG</b>	<b>0.06</b>	<b>0.15</b>	
S×T	<b>SIG</b>	<b>0.08</b>	<b>0.23</b>		<b>SIG</b>	<b>0.10</b>	<b>0.28</b>		<b>SIG</b>	<b>0.12</b>	<b>0.34</b>	

S-potting media, T-vermiwash and cattle urine treatments, S X T- interaction effect

**Table.3(b)** Effect of potting media, vermiwash and cattle urine on girth at collar region (cm) of jackfruit grafts cv. Konkan Prolific

Girth at collar region (cm)												
Treatments	At 120 days				At 150 days				At 180 days			
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
T <sub>1</sub>	1.58	2.09	1.90	<b>1.86</b>	1.70	2.32	2.01	<b>2.01</b>	1.81	2.52	2.14	<b>2.16</b>
T <sub>2</sub>	2.57	2.10	2.32	<b>2.33</b>	2.87	2.31	2.51	<b>2.56</b>	3.14	2.51	2.71	<b>2.79</b>
T <sub>3</sub>	1.85	1.74	1.94	<b>1.84</b>	1.96	1.89	2.06	<b>1.97</b>	2.09	2.04	2.19	<b>2.11</b>
T <sub>4</sub>	2.22	1.51	2.47	<b>2.07</b>	2.40	1.58	2.68	<b>2.22</b>	2.57	1.67	2.94	<b>2.39</b>
T <sub>5</sub>	1.80	1.50	2.06	<b>1.79</b>	1.93	1.56	2.20	<b>1.90</b>	2.07	1.62	2.33	<b>2.01</b>
T <sub>6</sub>	2.39	1.96	1.56	<b>1.97</b>	2.61	2.02	1.75	<b>2.13</b>	2.84	2.11	1.88	<b>2.28</b>
T <sub>7</sub>	2.24	2.18	1.49	<b>1.97</b>	2.48	2.34	1.59	<b>2.14</b>	2.70	2.52	1.70	<b>2.31</b>
T <sub>8</sub>	1.51	2.62	1.82	<b>1.98</b>	1.57	2.90	1.97	<b>2.15</b>	1.63	3.17	2.09	<b>2.30</b>
T <sub>9</sub>	2.27	1.58	1.57	<b>1.81</b>	2.49	1.65	1.71	<b>1.95</b>	2.73	1.74	1.86	<b>2.11</b>
Mean	<b>2.05</b>	<b>1.92</b>	<b>1.90</b>		<b>2.22</b>	<b>2.06</b>	<b>2.05</b>		<b>2.40</b>	<b>2.21</b>	<b>2.20</b>	
	'F' test	SEm ±	CD at 5%		'F' test	SEm ±	CD at 5%		'F' test	SEm ±	CD at 5%	
S	NS	<b>0.05</b>	-		NS	<b>0.07</b>	-		NS	<b>0.06</b>	-	
T	<b>SIG</b>	<b>0.08</b>	<b>0.23</b>		NS	<b>0.12</b>	-		<b>SIG</b>	<b>0.11</b>	<b>0.30</b>	
S×T	<b>SIG</b>	<b>0.14</b>	<b>0.40</b>		<b>SIG</b>	<b>0.21</b>	<b>0.58</b>		<b>SIG</b>	<b>0.19</b>	<b>0.53</b>	

S-potting media, T-vermiwash and cattle urine treatments, S X T- interaction effect



**Table.4(a)** Effect of potting media, vermiwash and cattle urine on number of leaves of jackfruit grafts cv. Konkan Prolific

Number of leaves												
Treatments	At 30 days				At 60 days				At 90 days			
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
T <sub>1</sub>	9.00	6.33	11.00	<b>8.78</b>	15.33	11.50	17.00	<b>14.60</b>	22.00	16.67	22.33	<b>20.33</b>
T <sub>2</sub>	6.00	6.55	5.33	<b>5.96</b>	11.33	10.61	10.00	<b>10.63</b>	17.33	14.00	15.67	<b>15.67</b>
T <sub>3</sub>	8.67	7.17	5.00	<b>6.95</b>	14.67	10.33	9.67	<b>11.57</b>	21.67	13.50	14.33	<b>16.50</b>
T <sub>4</sub>	10.67	8.00	8.67	<b>9.11</b>	17.00	11.33	14.00	<b>14.10</b>	23.67	16.33	19.67	<b>19.89</b>
T <sub>5</sub>	8.67	4.00	7.00	<b>6.56</b>	11.33	8.67	11.33	<b>10.43</b>	16.33	12.33	16.33	<b>15.00</b>
T <sub>6</sub>	8.67	5.00	3.67	<b>5.78</b>	11.67	9.33	7.00	<b>9.33</b>	16.67	13.00	10.33	<b>13.33</b>
T <sub>7</sub>	7.33	6.67	7.33	<b>7.11</b>	11.33	9.67	12.67	<b>11.23</b>	22.67	12.17	18.00	<b>17.61</b>
T <sub>8</sub>	4.00	4.33	4.00	<b>4.11</b>	8.33	7.33	8.33	<b>7.97</b>	12.67	10.00	13.33	<b>12.00</b>
T <sub>9</sub>	6.55	4.00	7.67	<b>6.07</b>	11.44	8.33	12.67	<b>10.80</b>	17.28	11.33	18.00	<b>15.54</b>
<b>Mean</b>	<b>7.73</b>	<b>5.78</b>	<b>6.63</b>		12.48	9.67	11.41		<b>18.92</b>	<b>13.26</b>	<b>16.44</b>	
	<b>'F' test</b>	<b>SEm ±</b>	<b>CD at 5%</b>		<b>'F' test</b>	<b>SEm ±</b>	<b>CD at 5%</b>		<b>'F' test</b>	<b>SEm ±</b>	<b>CD at 5%</b>	
<b>S</b>	<b>NS</b>	<b>0.55</b>	<b>-</b>		<b>NS</b>	<b>0.80</b>	<b>-</b>		<b>SIG</b>	<b>0.98</b>	<b>2.79</b>	
<b>T</b>	<b>SIG</b>	<b>0.95</b>	<b>2.70</b>		<b>SIG</b>	<b>1.39</b>	<b>3.96</b>		<b>SIG</b>	<b>1.70</b>	<b>4.84</b>	
<b>S×T</b>	<b>NS</b>	<b>1.65</b>	<b>-</b>		<b>NS</b>	<b>2.41</b>	<b>-</b>		<b>NS</b>	<b>2.95</b>	<b>-</b>	

S-potting media, T-vermiwash and cattle urine treatments, S X T- interaction effect

**Table.4(b)** Effect of potting media, vermiwash and cattle urine on number of leaves of jackfruit grafts cv. Konkan Prolific

Number of leaves												
Treatments	At 120 days				At 150 days				At 180 days			
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
T <sub>1</sub>	28.33	21.67	28.67	<b>26.22</b>	33.67	27.17	34.33	<b>31.72</b>	40.00	32.83	39.67	<b>37.50</b>
T <sub>2</sub>	23.00	19.72	20.33	<b>21.02</b>	29.00	25.00	25.67	<b>26.56</b>	35.33	30.22	31.33	<b>32.29</b>
T <sub>3</sub>	29.00	18.17	19.67	<b>22.28</b>	35.33	22.67	24.00	<b>27.33</b>	40.67	26.83	29.00	<b>32.17</b>
T <sub>4</sub>	30.33	22.67	24.00	<b>25.67</b>	38.33	29.67	29.00	<b>32.33</b>	44.33	36.33	33.00	<b>37.89</b>
T <sub>5</sub>	22.33	18.33	21.33	<b>20.66</b>	27.67	22.67	26.33	<b>25.56</b>	34.00	26.67	31.67	<b>30.78</b>
T <sub>6</sub>	21.67	17.00	14.67	<b>17.78</b>	27.33	21.33	19.00	<b>22.55</b>	33.33	26.33	22.33	<b>27.33</b>
T <sub>7</sub>	30.33	15.33	23.00	<b>22.89</b>	37.33	18.83	28.00	<b>28.05</b>	44.33	22.83	32.67	<b>33.28</b>
T <sub>8</sub>	18.00	13.67	17.33	<b>16.33</b>	23.00	17.33	21.67	<b>20.67</b>	28.00	21.67	26.00	<b>25.22</b>
T <sub>9</sub>	23.05	15.67	23.33	<b>20.68</b>	28.83	19.33	29.00	<b>25.72</b>	35.16	22.33	34.67	<b>30.72</b>
Mean	<b>25.12</b>	<b>18.03</b>	<b>21.37</b>		<b>31.17</b>	<b>22.67</b>	<b>26.33</b>		<b>37.24</b>	<b>27.34</b>	<b>31.15</b>	
	'F' test	SEm ±	CD at 5%		'F' test	SEm ±	CD at 5%		'F' test	SEm ±	CD at 5%	
S	<b>SIG</b>	<b>1.15</b>	<b>3.25</b>		<b>SIG</b>	<b>0.99</b>	<b>2.82</b>		<b>SIG</b>	<b>1.42</b>	<b>4.04</b>	
T	<b>SIG</b>	<b>1.99</b>	<b>5.63</b>		<b>SIG</b>	<b>1.72</b>	<b>4.89</b>		<b>SIG</b>	<b>2.47</b>	<b>7.00</b>	
S×T	<b>NS</b>	<b>3.44</b>	<b>-</b>		<b>NS</b>	<b>2.98</b>	<b>-</b>		<b>NS</b>	<b>4.27</b>	<b>-</b>	

S-potting media, T-vermiwash and cattle urine treatments, S X T- interaction effect

**Table.5** Effect of potting media, vermiwash and cattle urine on number of shoots of jackfruit grafts cv. Konkan Prolific

Number of leaves												
Treatments	At 60 days				At 120 days				At 180 days			
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
T <sub>1</sub>	0.33	0.67	1.33	<b>0.78</b>	1.67	2.50	3.33	<b>2.50</b>	2.67	4.83	5.00	<b>4.67</b>
T <sub>2</sub>	0.33	1.00	0.00	<b>0.44</b>	1.67	2.72	2.00	<b>2.13</b>	2.33	3.72	3.33	<b>3.70</b>
T <sub>3</sub>	0.33	0.67	0.00	<b>0.33</b>	2.33	2.67	2.33	<b>2.44</b>	2.67	3.50	3.67	<b>3.78</b>
T <sub>4</sub>	0.33	0.33	1.00	<b>0.55</b>	2.00	2.67	3.00	<b>2.56</b>	2.67	3.67	4.00	<b>4.44</b>
T <sub>5</sub>	0.00	0.00	0.67	<b>0.22</b>	2.00	2.00	1.67	<b>1.89</b>	3.00	3.00	3.33	<b>3.44</b>
T <sub>6</sub>	0.33	0.33	0.00	<b>0.22</b>	2.33	2.33	1.00	<b>1.89</b>	3.00	3.67	3.00	<b>3.56</b>
T <sub>7</sub>	0.00	0.33	0.33	<b>0.22</b>	2.00	2.00	2.00	<b>2.00</b>	2.33	3.83	4.00	<b>3.78</b>
T <sub>8</sub>	0.00	0.33	0.00	<b>0.11</b>	2.00	2.00	2.00	<b>2.00</b>	3.00	3.00	3.00	<b>3.44</b>
T <sub>9</sub>	1.00	0.00	0.00	<b>0.33</b>	2.67	2.00	2.33	<b>2.33</b>	2.94	3.67	4.33	<b>4.00</b>
Mean	<b>0.29</b>	<b>0.41</b>	<b>0.37</b>		<b>2.07</b>	<b>2.32</b>	<b>2.18</b>		<b>2.73</b>	<b>3.65</b>	<b>3.74</b>	
	'F' test	SEm ±	CD at 5%		'F' test	SEm ±	CD at 5%		'F' test	SEm ±	CD at 5%	
S	NS	<b>0.11</b>	-		NS	<b>0.17</b>	-		SIG	<b>0.18</b>	<b>0.50</b>	
T	NS	<b>0.20</b>	-		NS	<b>0.29</b>	-		NS	<b>0.31</b>	-	
S×T	NS	<b>0.34</b>	-		NS	<b>0.50</b>	-		NS	<b>0.53</b>	-	

S-potting media, T-vermiwash and cattle urine treatments, S X T- interaction effect

**Table.6** Effect of potting media, vermiwash and cattle urine on dry matter (g) of Jackfruit grafts cv. Konkan Prolific (at 180 days)

Dry Matter (g) at 180 days				
Treatments	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
T <sub>1</sub>	5.67	6.67	12.67	<b>8.34</b>
T <sub>2</sub>	4.33	7.00	13.00	<b>8.11</b>
T <sub>3</sub>	5.33	6.33	14.33	<b>8.66</b>
T <sub>4</sub>	6.00	7.00	12.00	<b>8.33</b>
T <sub>5</sub>	4.67	7.67	12.67	<b>8.34</b>
T <sub>6</sub>	5.00	7.00	12.33	<b>8.11</b>
T <sub>7</sub>	6.00	7.00	13.00	<b>8.67</b>
T <sub>8</sub>	5.00	7.67	12.00	<b>8.22</b>
T <sub>9</sub>	6.33	8.00	12.67	<b>9.00</b>
<b>Mean</b>	<b>16.11</b>	<b>21.44</b>	<b>38.22</b>	
	<b>'F' test</b>	<b>SEm ±</b>	<b>CD at 5%</b>	
<b>S</b>	<b>SIG</b>	<b>0.23</b>	<b>0.64</b>	
<b>T</b>	<b>NS</b>	<b>0.39</b>	<b>-</b>	
<b>S×T</b>	<b>NS</b>	<b>0.68</b>	<b>-</b>	

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