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Performance of Different Varieties of Tinda (*Praecitrullus fistulosus*) under Prayagraj Agro-climatic Condition

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The present experiment was carried out during summer season 2022-23 in Central Horticulture Research Farm of Department of Horticulture, SHUATS, Prayagraj. The experiment was conducted to evaluate Performance of different varieties of Tinda (*Praecitrullus fistulosus*) under Prayagraj agro climatic condition. For the evaluation eight varieties treatments were **V1-**Ludhiana Special, V2-S-48, V3-Raja, V4-Komal, V5-IHS-45, V6-Laddu, V7-Heera, V8-Mahy Tinda are taken for the study in a Randomized Block Design with three replications in 2.5 x 1.5 m plot. The study revealed that the maximum vine length 182.8cm in V5 IHS-45. The number of primary branches was maximum in V5-IHS-45, 6.43 at final harvestings. At harvesting the number of nodes per plant was Maximum in V5-IHS-45, 34.36. Days to first female flower appearance was minimum in IHS45, 26.30. IHS-45 was found to be the best variety for fruit weight with 63.14gm. IHS-45 was found to be the best variety for diameter of fruit with 54.12mm. IHS-45 produced the maximum fruit yield/ha and the fruit yield was 143.66q/ha. Among the different varieties studied, IHS-45 performed best for flower, fruit

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and yield characters. And the best varieties followed by Laddu and Mahy Tinda. The study revealed that, these varieties of Tinda provide high benefit to the farmers through easy cultivation, better stress tolerance, diseases resistance and higher yield.

Keywords: Varieties treatment; tinda; growth; yield.

1. INTRODUCTION

Round melon (*Praecitrullus fistulosus*) belongs to family Cucurbitaceae. The cucurbits are mostly indigenous to India and they are widely grown throughout the country. The origin of round melon is probably western India. It is commonly known as tinda or Indian round gourd or apple gourd or Indian squash or squash melon. It is widely grown in north-western states of India such as Punjab, Haryana, Rajasthan, Delhi and western part of U.P. The round melon is grown in spring-summer as well as in rainy season. It is a squash like cucurbit grown for its immature fruit. "It is warm season, monoecious annual vine. The flowers are yellow solitary. In addition to staminate flowers are on long pedicels and pistillate flowers are single with short peduncle. The fruit having light green skin with soft hair, approximately spherical 5-8 cm in diameter and 45-60 g average fruit weight" [1]. "The immature tender fruits of Tinda are used as a vegetable, canned, rotator curry preparation and its seeds are roasted and consumed. This short duration crop is becoming very popular in north India due to its high nutritional value, good taste and keeping quality as well as high remunerative price" [2]. "Potassium is an important element in plant metabolism, promoting carbohydrates synthesis" [3]. "It has the strongest influence on plant growth, yield and quality attributes that determine fruit marketability" [4]. "Nutrition plays a very important role in the performance of plant. Amongst nutrients, inorganic nitrogenous fertilizers are commonly used by most of the farmers because of quick availability of nitrogen to the plants. Application of fertilizer, especially nitrogen is considered to be the most important factor for vegetable production. It imparts dark green colour to plants and promotes overall growth and finely governs the yield. Nitrogen fertilization favours the development of the aerial parts over roots and consequently the promotion of flowering and fruiting of many crops". "Moreover, nitrogen promotes vegetative growth, flowering, fruit set, improve fruit quality, fruit size and number of fruits per plant. Next to nitrogen, phosphorus is the second important nutrient required by plants. Phosphorus is of paramount importance for energy transfer in living cells by mean of high energy phosphate bonds of ATP. It also affects protein content, quality and yield. Phosphorus is necessary for cellular preparation and in the metabolism of starch, protein and fats. One of the most important effects of phosphorus on plants is the stimulation of early root formation and growth. Phosphorus is necessary for cellular preparation and in the metabolism of starch, protein and fats. One of the most important effects of phosphorus on plants is the stimulation of earlyroot formation and growth. Low available phosphorus content in soil means delay in maturity and poor plant growth" [5]. Very less work has been carried out on nutrition of round melon in India. Shendge (1995) reported that "for obtaining better fruit yield of tinda var. Ludhiana Tinda, the crop should be fertilized with 80 kg N and 50 kg P2 O5 per hectare". "An application of 40 kg N, 60 kg P and 40 kg K /ha has been advocated" by Nath and Swamy [1]. Natchathra et al. [6] reported that "more number of fruits (14.41), highest single fruit weight (50.68 g) and highest yield per plant (722.69 g) were obtained with treatments comprising 75 percent recommended dose of fertilizers (recommended dose of inorganic fertilizers @ 50:20:20 kg NPK ha-1) package coupled with vermicompost @ 2 t ha-1 along with Azospirillum and 3 phosphobacteria @ 2 kg ha-1". Seshadri and Parthasarathy [7] had reported that application of 56 kg N, 28 kg P and 28 kg K is most profitable for round melon. No recommendation of nutrients for round melon has been found in the literature for Madhya Pradesh.

2. MATERIALS AND METHODS

The experiment was conducted at Vegetable Research Farm, Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology & Sciences, Prayagraj (UP) during Prayagraj during the *Zaid* season of 2022. Soils of the experimental site are classified as rich loam soil. The annual rainfall in the region is about 1042 mm. The experiment was laid out in randomized block design with three replications. There were total eight varieties of Tinda viz. V1 (Ludhiana Special), V2 (S-48), V3 (Raja), V4 (Komal), V5 (IHS-45), V6 (Laddu), V7 (Heera), V8 (Mahy Tinda).

2.1 Statistical Analysis

The Data recorded throughout the course of investigation was subjected to Statistical analysis by using analysis of variance (ANOVA) for randomized block design (RBD) by Fischer and Yates (1963). Whenever 'F' test was found significant for comparing the means of two treatments, a critical difference (C. D. at 5%) was worked out.

3. RESULTS AND DISCUSSION

Earliness Parameters: Data pertaining to earliness parameters which are days to emergence of 1st male flower, days to emergence of 1st female flower, node No. at which 1st male flower in appears, node No at which 1st female flower in appear, number of Male flowers, number of Female flowers, days to first fruit setting, days to first fruit picking, Sex ratio.

3.1 Days to Emergence of 1st Male Flower

The analysis of variance presented in Table 1 showed significant differences among varieties the days to emergence of first male flower ranged from 22.80 to 24.03 and minimum days to emergence of first male flower were recorded in IHS-45(22.80) followed by Mahy Tinda (22.85) while maximum days to, male of first male flower were recorded in Raja (24.03). The days of first appearance of male flower plays an important role in deciding the earliness or lateness of crop in general. Similar findings were reported by Sharma and Bhattarai (2006) and Patel et al*.,* [8].

3.2 Days to Emergence of 1st Female Flower

The analysis of variance presented in Table 1 showed significant differences among varieties the days to emergence of first female flower ranged from 26.30 to 29.47 and minimum days to emergence of first female flower were recorded in IHS-45(26.30) followed by Laddu (27.00), while maximum days to emergence of first female flower were recorded in Raja (29.47). The number of days from sowing of first appearance of female flower is an important character that indicates earliness or lateness of the crop in general. Similar findings were reported by Sharma and Bhattarai (2006) and Patel et al*.,* [8].

3.3 Node No. at Which 1st Male Flower in Appeared

The analysis of variance presented in Table 1 showed significant differences among varieties the node number at first male flower appeared ranged from 2.20 to 2.70 and minimum node number to first male flower was recorded in Raja (2.20) was recorded in IHS-45(2.70). The variation in node number at which first male flower appears might have been due to specific genetic makeup of different Varieties prevailing environment condition. Similar findings were reported by Dwivedi and Kumar [4], Patel et al., [8].

3.4 Node No at Which 1st Female Flower in Appeared

The analysis of variance presented in Table 1 showed significant differences among varieties the node number at first female flower appeared ranged from 5.87 to 7.23 and minimum node number to first female flower was recorded in S48(5.87) followed by Raja (2.20) while maximum node number to first female flower was recorded in IHS-45(7.23). The variation in node number at which first female flower appears might have been due to specific genetic makeup of different Varieties and prevailing environmental condition. Similar findings were reported by Dwivedi and Kumar [4], Patel et al*.,* [8].

3.5 Number of MALE Flowers

The analysis of variance presented in Table 1 showed significant differences among varieties the number to male flowers ranged from 114.60 to 200.06 and minimum number of male flowers was recorded in Mahy Tinda (114.60) followed by Ludhiana Special (121.46) long while maximum number of male flowers was recorded in Laddu (200.06). The variation in number of male flowers might have been due to their genetic nature, environmental factor, hormonal factor and vigour of crop. Similar results have been reported by Dwivedi and Kumar [4], Patel et al., [8].

3.6 Number of Female Flowers

The analysis of variance presented in Table 1 showed significant differences among varieties for the number to female flowers ranged from 14.60 to 28.53 and minimum number of female flowers was recorded in Mahy Tinda (14.60) followed by Komal (18.40) while maximum number of female flowers was recorded in IHS45(28.53). The variation in number of female flowers might have been due to their genetic nature, environmental factor, hormonal factor and vigour of crop. Similar results have been

reported by Dwivedi and Kumar [4], Patel et al*.,* [8].

3.7 Days to First Fruit Setting

The analysis of variance presented in Table 1 showed significant differences among varieties and their interactions for days to first fruit setting ranged from 48.20-50.20 days after sowing. The significantly minimum days taken to fruit setting at (48.20) days after sowing recorded in the variety IHS-45 followed by the variety Laddu (49.20) Whereas, maximum days taken to fruit setting was recorded in the variety Heera (50.20). Significant difference of data for days to fruit initiation and edible maturity denoted those different genetic constitutions of the varieties affected the performance of cultivars differently. Similar results have been reported by Dwivedi and Kumar [4].

3.8 Days to First Fruit Picking

The analysis of variance presented in Table 1 showed significant differences among varieties and their interactions for days to first fruit picking ranged from 41.27 to 45.03 and minimum days to first fruit picking were recorded in IHS-45(41.27) followed by Laddu (42.03), while maximum days to first fruit picking were recorded in Raja (45.03). The variation in days to first fruit picking might have been due to genetic factor, environmental factor, hormonal factor and vigour of crop. Similar results have been reported by Jilani et al. (2009), Eifediyi and Remison [9].

3.9 Sex Ratio

The analysis of variance presented in Table 1 showed significant differences among varieties for sex ratio ranged from 4.10 to 6.30 and minimum number of female flowers was recorded in Raja (4.10) followed by Ludhiana special (4.20) while maximum number of female flowers was recorded in IHS-45 (6.30). Sex ratio is highly sensitive to environmental conditions. High N, long days and high temperature generally promote the greater number of male flowers. The proportion of male and female flowers affects the yield and the cultivars having more pistillate flowers will set more fruits resulting in higher yields.

Growth Parameters: Data pertaining to yield parameters which are Vine length (cm), Number of primary branches per plant, No. of nodes, No. of leaves, Chlorophyll content (SPAD value), Leaf area (cm2)

3.10 Vine Length (cm)

The data related Vine length (cm) is given in Table 2. Variety V5 (IHS-45) recorded maximum vine length at harvesting i.e., 182.8cm, after sowing respectively. Minimum vine length of 124.33 cm was found in variety V3 (Raja) at harvesting, after sowing respectively. The variation in vine length might have been due to specific genetic makeup of different Varieties, inherent properties, environmental factor, hormonal factor and vigor of the crop. The similar findings were also recorded by Eifediyi and Remison [10], Patel et al*.,* [8].

3.11 Number of Primary Branches per Plant

The data related to no. of primary branches per plant is presented in Table 2 variety V5 (IHS-45) recorded maximum number of branches per plant at harvesting i.e., 6.43, after sowing respectively. Minimum no. of branches per plant of 3.70 was found in variety V3 (Raja) at harvesting, after sowing respectively. The variation in number of branches per vine might have been due to its own genetic makeup and also due to vine length, internodal length, hormonal factor and environmental factor also. The similar findings were also recorded by Sharma and Bhattarai (2006), Eifediyi and Remison [9], Patel et al*.,* [8].

3.12 No. of Nodes

The data related to no. of nodes is given in Table 2. Variety V5 (IHS-45) recorded maximum number of nodes per plant at harvesting i.e., 34.36, after sowing respectively. Minimum no. of nodes per plant of 22.91cm was found in variety V7 (Heera) at harvesting, after sowing respectively. It is concluded that the reason for number of nodes per plant is a varietal character or it may be increased due to the different rates of photosynthesis and photosynthates supply for maximum growth. These findings are in agreement with the results reported by Nath et al., [1].

3.13 No. of Leaves

The data related to no. of leaves is given in Table 2. Variety V5 (IHS-45) recorded maximum

number of leaves per plant at harvesting i.e., 81.00, after sowing respectively. Minimum no. of leaves per plant of 42.83 was found in variety V3 (Raja) at harvesting, after sowing respectively. The variation in number of leaves might have been due to its own genetic makeup and also due to vine length, internodal length, hormonal factor and environmental factor also. The similar findings were also recorded by Sharma and Bhattarai (2006), Eifediyi and Remison [10], Patel et al*.,* [8].

3.14 Chlorophyll Content (SPAD Value)

The data related chlorophyll content is given in Table 2. Variety V5 (IHS-45) recorded maximum SPAD value at harvesting i.e., 66.99, after sowing respectively. Minimum SPAD value 53.51 was found in variety V3 (Raja) at harvesting, after sowing respectively.

3.15 Leaf Area (cm^2)

The analysis of variance presented in Table 2 showed significant differences among varieties the leaf area (cm^2) minimum leaf area was recorded in V8 Mahy Tinda (110.16) long while maximum leaf area was recorded in V5 Variety IHS-45(119.81). The variation in leaf area might have been due to its own genetic makeup and also due to vine length, internodal length, hormonal factor and environmental factor also. The similar finding were also recorded by Sharma and Bhattarai (2006), Eifediyi and Remison [10], Patel et al., [8].

Quality parameters: Data pertaining to Quality parameters which are TSS (^oBrix), Vitamin C (mg/100g), Seed and pulp ratio.

3.16 TSS (°Brix)

The mean data on TSS of Tinda affected by different varieties treatments are presented in Table 3. There was significant difference found in various varieties for Total Soluble Solid (^oBrix) ranged from 4.07 to 5.37. The maximum Total Soluble Solid (^oBrix) was recorded in the Komal (5.37^oBrix) and minimum was recorded in the Mahy Tinda (4.07^oBrix). The higher TSS value in Komal may be due to its inherent characteristics. TSS is a one of the quality attributes of Tinda fruit. Fruits with high TSS are highly preferred. Enhanced deposition of solids may be probable reason for higher TSS values. Similar results reported by Vishwakarma et al., (2013).

3.17 Ascorbic Acid (mg/100 g)

The analysis of variance presented in Table 3 showed significant differences among varieties treatments and their interactions for Vitamin C (mg/100g) ranged from 6.44 to 7.06. The mean values for Ascorbic acid (mg/100g) revealed that the maximum Ascorbic acid (mg/100g) was recorded in the Komal with (7.10 (mg/100g)) and Minimum was recorded in the Raja (6.44 (mg/100g). Generally, high ascorbic acid content would increase the nutritive value of tinda, which would help better retention of color and flavor. Similar estimates for this character were also recorded by Vishwakarma et al., (2013).

3.18 Seed and Pulp Ratio

The data presenting to seed and pulp ratio per fruit as affected by various varieties treatments of tinda are presented in Table 3. Results showed significant differences among varieties and among their interactions for Seed and Pulp Ratio ranged from 16.70 to 31.30. The mean values for Seed and pulp ratio revealed that the maximum value was recorded in the Laddu with (31.30) and Followed by the Komal with (29.10) and Minimum was recorded in the Ludhiana Special with (16.70).

Yield parameters: Data pertaining to yield parameters which are No. of fruits per plant, Average fruit weight(g), Fruit diameter (mm), Fruit yield per plot (kg), Fruit yield per hectare (q/ha), Fruit set percentage (%).

3.19 Number of Fruits per Plant

The data presenting to number of fruits per plant as affected by various Varieties treatments are presented in Table 4. Results indicated that Fruit yield per plant was recorded between ranges 8.99 to 12.56. The variety IHS-45(12.56 fruit per plant) was found significantly superior which was followed by Laddu (12.03 fruit per plant) as compared to rest of the varieties. While, the lowest (8.99 fruit per plant) was noted in the variety Komal. The variation in no. of fruits per vine might have been due to sex ratio, fruit set percentage, genetic nature and their response to varying environmental conditions. Similar results have been reported by Jilani et al., (2009), Eifediyi and Remison [10].

Table 1. Performance of different varieties on earliness parameters of Tinda

Notation	Name of Varieties	Days to 1st male flower appeared	Days to 1st female flower appeared	Node no. at 1st male flower appeared	Node no. at 1st female flower appeared	No. of Male flowers	No. of Female flowers	Days to 1st fruit setting	Days to 1st fruit picking	Sex ratio
V_1	Ludhiana Special	23.44	27.93	2.37	6.67	121.46	24.00	49.60	43.83	4.20
V_2	S-48	23.50	27.47	2.40	5.87	143.80	22.33	49.40	42.53	4.50
V_3	Raja	24.03	29.47	2.20	6.13	149.86	24.20	49.80	45.03	4.10
V_4	Komal	23.43	27.17	2.43	6.37	165.73	18.40	49.20	43.60	5.10
V_5	IHS-45	22.80	26.30	2.70	7.23	179.46	28.53	48.20	41.27	6.30
V_6	Laddu	23.37	27.00	2.67	6.77	200.06	21.13	49.20	42.03	5.80
V_7	Heera	23.80	28.63	2.43	6.50	169.80	22.93	50.20	44.40	5.60
V_8	Mahy Tinda	22.85	27.38	2.21	6.51	114.60	14.60	49.00	43.27	5.40
F-TEST		S	S	S	S	S	S	S	S	S
SE(d)		0.026	0.026	0.862	0.473	0.857	0.507	0.683	0.624	1.847
C.D.(P=0.05)		0.053	0.053	1.780	0.975	1.769	1.046	1.409	1.287	3.812
C.V.		16.733	3.998	5.956	3.108	144.732	29.064	57.943	5.620	6.325

Table 2. Performance of different varieties on growth parameters of Tinda

Notation	Name of Varieties	Vine length(cm) (At harvest)	No. of primary branches (At harvest)	No. of nodes (At harvest)	No. of leaves (At harvest)	SPAD Value (At harvest)	Leaf area(cm^2)
V_1	Ludhiana Special	157.3	4.80	33.32	68.47	58.65	110.71
V_2	S-48	148.7	3.87	32.37	57.77	54.04	116.35
V_3	Raja	124.33	3.70	33.59	42.83	53.51	117.45
V_4	Komal	149.13	4.07	32.95	59.57	57.69	114.65
V_5	IHS-45	182.8	6.43	34.36	81.00	66.99	119.81
V_6	Laddu	175.33	5.23	33.96	75.27	60.79	117.45
V_7	Heera	177.13	5.20	31.97	74.67	60.45	114.19
V_8	Mahy Tinda	165.73	4.93	32.7	69.97	58.60	110.16
F-TEST		S	S	S	S	S	S
SE(d)		2.825	0.365	3.415	0.219	0.539	0.018
C.D.(P=0.05)		5.830	0.753	7.049	0.452	1.113	0.038
C.V.		22.495	19.732	7.602	20.471	7.644	0.966

Table 3. Performance of different varieties on quality parameters of Tinda

Notation	Name of Varieties	TSS(^{0}Brix)	Vitamin C (mg/100g)	Seed and Pulp ratio
V_1	Ludhiana Special	4.77	6.68	16.70
V_2	S-48	5.15	7.06	25.00
V_3	Raja	4.18	6.44	18.10
V_4	Komal	5.37	7.10	29.10
V_5	IHS-45	4.95	6.94	25.90
V_6	Laddu	4.68	6.67	31.30
V_7	Heera	4.43	6.89	25.50
V_8	Mahy Tinda	4.07	6.61	25.50
F-TEST		S	S	S
SE(d)		0.197	0.360	0.197
C.D.(P=0.05)		0.406	0.742	0.406
C.V.		15.019	15.506	27.258

Table 4. Performance of different varieties on yield parameters of Tinda

Notation	Name of Varieties	No. of fruits per plant	Average fruit weight(g)	Fruit diameter(mm)	Fruit yield per plot(kg)	Fruit yield per hectare(q/ha)	Fruit set percentage (%)
V_1	Ludhiana Special	9.46	53.01	47.7	4.25	100.58	39.42
V_2	S-48	10.19	58.25	51.13	5.42	113.57	45.63
V_3	Raja	7.73	53.78	46.22	3.60	77.26	31.94
V_4	Komal	8.99	47.64	45.96	3.12	93.84	48.86
V_5	IHS-45	12.56	63.14	54.12	8.63	143.66	44.02
V_6	Laddu	12.03	59.49	52.56	7.04	133.98	56.93
V_7	Heera	10.52	54.51	49.3	5.08	117.18	45.88
V_8	Mahy Tinda	11.3	60.63	50.71	5.57	124.14	77.40
F-TEST		NS	S	S	S	S	S
SE(d)		0.525	0.110	0.183	0.414	3.104	1.044
C.D.(P=0.05)		1.084	0.226	0.377	0.854	6.406	2.154
C.V.		7.468	21.496	21.361	10.836	27.686	

3.20 Average Fruit Weight (g)

The data are presented in Table 4 revealed that various varieties treatments a significant effect on average weight of fruit (g) of Tinda. It is observed from the data that fruit weight was recorded between the ranges 47.64 to 63.14 g. The variety IHS-45was found significantly superior (63.14g) which was followed by the variety Mahy Tinda (60.63g) as compared to rest of the varieties. While, the lowest (47.64 g) fruit weight was noted in the variety Komal. The higher fruit diameter result into higher fruit weight. The highest fruit weight in IHS-45 may be due to its adoptability to Allahabad agro-climatic conditions. Similar results have been reported by Jilani et al., (2009), Patel et al*.,* [8].

3.21 Fruit Diameter (mm)

The mean data on fruit diameter (mm) of Tinda affected by different varieties treatments are presented in Table 4. There was significant difference found in various varieties fruit diameter(mm) ranged from 45.96mm to 54.12mm [11-15]. The mean values for fruit diameter revealed that the maximum fruit diameter was recorded in the IHS-45(54.12mm) and Followed by the Laddu (52.56mm) and Minimum was recorded in the Komal (45.96mm). Increasing of fruit yield is mostly influenced by fruit diameter. The fruit diameter will be high than automatically fruit yield will be also high. The variation in fruit diameter, might have been due to genetic factor, environmental factor, hormonal factor and vigour of the crop. Similar results have been reported by Dwivedi and Kumar [4].

3.22 Fruit Yield per Plot (kg)

The mean data on fruit yield (kg/plot) of affected by different varieties treatments are presented in Table 4. There was significant difference found in various varieties for fruit yield per plot ranged from 3.12 to 8.63kg. The mean values for fruit yield per plot revealed that the maximum fruit yield per plot was recorded in the IHS-45(8.63kg) and Followed by the Laddu (7.04kg) and Minimum was recorded in the Komal (3.12kg). The significant variation in fruit yield per plot (kg) might have been due to fruit set percentage, fruit diameter, number of fruits per vine, fruit weight and genetic nature, environmental factor and vigour of the crop [16-19]. These findings were supported by Dwivedi and Kumar [4], Patel et al*.,* [8].

3.23 Fruit Yield per Hectare (q/ha)

The fruit yield per hectare (q/ha) of Tinda as affected by various treatments different varieties treatments are presented in Table 4. There was significant difference found in various varieties for fruit yield (q/ha) ranged from 77.26 to 143.66.The mean values for fruit yield per plot revealed that the maximum fruit fruit yield (q/ha) was recorded in the IHS-45(143.66q/ha) and Followed by the Laddu (133.98q/ha) and Minimum was recorded in the Raja (77.26q/ha). The significant variation in fruit yield per hectare(q/ha) might have been due to fruit set percentage, fruit diameter, number of fruits per vine, fruit weight and genetic nature, environmental factor and vigour of the crop. These findings were supported by Dwivedi and Kumar [4], Patel et al., [8].

3.24 Fruit Set Percentage (%)

The Fruit set percentage (%) of Tinda as affected by various treatments different varieties treatments are presented in Table 4. There was significant differences among varieties and their interactions for fruit set percentage (%) ranged from 31.94 to 77.40.The mean values for fruit set percentage (%) revealed that the maximum fruit set percentage (%) was recorded in the Mahy Tinda (77.40%) and Followed by the Laddu (56.93%) and Minimum was recorded in the Raja (31.94%). The variation in fruit set percentage may occurs due to the environmental factors and also due to genetic nature and vigour of the crop. These findings were supported by Dwivedi and Kumar [4], Patel et al., [8].

3.25 Cost Benefit Analysis

Considering all the economics of different Varieties treatment It can be seen from the Table 5 that Tinda Variety V_5 IHS-45 recorded higher net monitory returns (Rs 119102) and lowest net monitory return in Variety V_3 Raja (Rs 39122). The maximum B:C ratio was obtained in IHS-45 (3.23) followed by Laddu (2.96), while the minimum B:C ratio was obtained in Raja (1.73).

Table 5. Performance of different varieties on economics of Tinda

Notation	Gross return (Rs. /ha)	Cost of cultivation (Rs. /ha)	Net return (Rs. /ha)	B:C Ratio
V1	120696	53,190	67506	2.26
V2	136284	53,390	82894	2.55
V3	92712	53,590	39122	1.73
V4	112608	54,490	58118	2.06
V5	172392	53,290	119102	3.23
V6	160776	54,190	106586	2.96
V7	140616	53,490	87126	2.62
V8	148968	53,690	95278	2.77

4. CONCLUSION

From the present investigation, it is concluded that, the Tinda fruit variety V5 (IHS-45) was recorded with maximum fruit yield (143.66) and best quality fruits with proper shape, colour and size and also performed best in terms of other yield contributing traits.

The maximum benefit cost ratio is also observed in V5(IHS-45) i.e., 3.23

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Nath P, Swamy KRM. Text book of vegetable crops. ICAR Publication, Pusa, New Delhi; 2016.
2. Samadia DK. Studies on genetic variability and scope of improvement in round melon under hot arid conditions; 2007.
3. El-Gengaihi S, Hendawy S, Kamel A. Effect of nitrogen and potassium on the yield and quality of Momordica charantia fruits. Herba Polonica. 2007;53(1):11-20.
4. Dwivedi AK, Kumar A. Interactive effects of nitrogen and potash fertilizers on growth and yield of kheksa (*Momordica dioica Roxb. Ex Wild*) under agro-climatic condition of zone V prevailing in Giridih district of Jharkhand. International Journal of Current Microbiology and Applied Sciences. 2018;7:427-434.
5. Meena OP, Bhati A. Response of nitrogen and phosphorous levels on growth and yield of bottle gourd. Chemical Science Review and Letters. 2017;6(24):2332-2336.
6. Natchathra VU, Anuja S, Haripriya K. Effect of organic manures and inorganic fertilizers on fruit yield of tinda (*Praecitrullus fistulosus*). The Asian Journal of Horticulture. 2016;11(2):408-410.
7. Seshadri VS, Parthasarathy VA. Cucurbits In: Bose TK, Kabir J, Maity TK, Parthasarathy VA and Som MG. (Eds.), Vegetable Crops, Naya Prokash, 206 Bidhan Sarani, Calcutta. 2002;1:559.
8. Patel JK, Vijay Bahadur, Devi Singh, Prasad VM, Rangare SB. Performance of cucumber (*Cucumis sativus L*.) hybrids in agro-climatic conditions of Allahabad. HortFlora Res. Spectrum. 2013;2(1):50-55.
9. Eifediyi EK, Remison SU. Growth and yield of cucumber as influenced by farmyard manure and inorganic fertilizer. J. Plant Breed. Crop Sci. 2010;2(7):216- 220.
10. Eifediyi EK, Remison SU. The effect of inorganic fertilizer on the yield of two varieties of cucumber. Report and Opinion. 2010;2(11):1-5.
11. Dahiya MS, Baswana KS, Tehlan SK. Genetic variability studies in round melon (*Praecitrullus fistulosus Pang.*). Haryana J. Hort. Sci. 2001;30(1-2):81-83.
12. Garg N. Genetic diversity in round gourd [*Praecitrullus fistulosus (Stocks) Pangalo*] accessions introduced from USDA for various qualitative and quantitative traits. Journal of Crop Improvement. 2017;31(6):801-815.
13. Harika MV, Gasti VD, Shantappa T, Mulge R, Shirol AM, Mastiholi AB, Kulkarni MS. Evaluation of bottle gourd genotypes [*Lagenaria siceraria (Mol.) Standl*.] for various horticultural characters. Karnataka J. Agric. Sci. 2012;25 (2):241-244.
14. Hilli JS, Vyakarnahal BS, Biradar DP, Hunje R. Influence of method of trailing and fertilizer levels on seed yield of ridge gourd (*Luffa acutangula L. Roxb*). Karnataka J. Agric. Sci. 2009;22(1):47-52.
15. Meena OP, Meena RK, Dhaka RS, Meena NK, Sharma A. Effect of nitrogen and

phosphorous levels on growth and yield of bottle gourd. International Journal of Pure & Applied Bioscience. 2017;5(4):1178-1184.

16. Mandal J, Mohanta S. Field assessment of tinda [*Praecitrullus fistulosus (Stocks) Pangalo*] genotypes under lateritic soils of Eastern India. Vegetable Science. 2018;45(1):287-290.
17. Natchathra VU, Anuja S, Haripriya K. Effect of organic manures and inorganic fertilizers on growth parameters in tinda (*Praecitrullus fistulosus*). Internat. J. Agric. Sci. 2017;13(1):43-45.
18. Nwofia GE, Amajuoyi AN, Mbah EU. Response of three cucumber varieties (*Cucumis sativus L*.) to planting season and NPK fertilizer rates in lowland humid tropics: sex expression, yield and inter-relationships between yield and associated traits. International Journal of Agriculture and Forestry. 2015;5(1):30-37.
19. Prathyusha NB, Singh D. Varietal evaluation studies in Cucumber under Prayagraj Agro-climatic conditions (*Cucumis sativus* L.). International Journal of Current Microbiology and Applied Sciences. 2020;9(11):454-62.

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