Assessment of different varieties of okra for yield, quality and economical feasibility cultivated under Hadoti region of South-East Rajasthan

Comment [S1]: Assessment of okra varieties: Yield, quality and economic importance under Hadoti region of South-East Rajasthan

ABSTRACT

The study focuses on the cultivation of okra, a prominent Indian vegetable with significance in both export and family consumption. Emphasizing the potential for increased okra production through the selection of high-yielding varieties, the research specifically targets the Hadoti region, aiming to identify varieties suitable for its agro-climatic conditions. The lack of such screening in the region prompted the study. The trial was conducted during the summer seasons of 2022 and 2023 at the Instructional Farm of Career Point University, Kota, Rajasthanand the research evaluated 12 okra varieties using a randomized block design with three replications. The analysis of variance revealed significant differences among all varieties for various traits, including yield, quality and economical feasibility. The study underscores the presence of a substantial varietal effect, offering insights into optimizing okra cultivation in the South-East climatic conditions of Rajasthan's Hadoti region. The results showed presence of significant varietal effect. However, the present study demonstrated the superiority of Punjab Selectionvariety over other varieties in terms of maximum mean fruit length (13.07 cm), fruit diameter (3.77 cm) and fruit weight (15.56 g), minimum mean titratable acidity (0.22%), maximum TSS (3.18 °B), ascorbic acid (19.64 mg/100g) and mucilage content (0.91%), maximum mean fruit yield per plant (0.53 kg), fruit yield per plot (11.68 kg) and fruit yield per hectare (124.30 q). However, the net return of Rs. 248575 Rs./ha and 249325 Rs./ha along with benefit cost ratio 5.02 and 5.05 in 2022 and 2023 respectively was also obtained from okra variety Punjab Selection.

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KEYWORDS: Assessment, Mucilage, TSS,Weight

INTRODUCTION

Okra[*Abelmoschusesculentus*(L.)Moench]holds a significant position among vegetables, known by various names globally such as lady's finger in England, Gumbo in the U.S.A., and Bhindi in India. In India, it stands as a crucial vegetable crop, cultivated for its tender green fruits during the summer and rainy seasons. Propagated through seeds, okra is valued for its delectable green fruits used in diverse culinary applications, including curries and soups. Notably remunerative, it surpasses leafy vegetables in economic returns. While not commonly consumed as a leafy vegetable in India, okra's roots and stems are utilized in the preparation of gur or jaggery. Ripe okra seeds find use as a coffee substitute in Turkey. Despite its economic importance, okra cultivation faces challenges, particularly from various insect pests and diseases such as jassid, fruit and shoot borer, powdery mildew, and yellow vein mosaic. The imperative to meet the growing world population's food requirements underscores the need for enhanced crop yield and resilience.

The study's primary focus is to identify superior-performing okra varieties in the Hadoti region of Rajasthan, specifically tailored for the South-East climatic conditions. This research aims to pinpoint varieties that not only adapt well to the local environment but also demonstrate resistance to biotic and abiotic stresses, ensuring optimal yield and quality. The understanding that a variety excelling in one locality may not be suitable for another emphasizes the need for region-specific assessments to enhance okra cultivation and contribute to sustainable food production.

Materials and Methods

Location

Kota district is located at 25.18° N to 75.83° E Latitude in South Eastern Rajasthan. It covers an area of 221.36 km^2. Agro-climatically, the district falls in Zone V, known as Humid South Eastern Plain. The average rainfall in the region is 660.6. mm. Maximum temperature range in the summer is 40 to 48°C and minimum 1.0- 2.6°C during winter. Major *kharif* crops of the district are soybean, maize and pulses. While in *rabi*, wheat, mustard, coriander and garlic are main crops.

Comment [S3]: Your overall focus on economic importance of okra but you can't write up a single line or give economic digit or okra share in agriculture etc.

Comment [S4]: In you study plan aim you mention biotic and abiotic stresses but you can't elaborate them in your overall paper

Comment [S5]: Besides to elaborate in sentences you should need to draw a graph (Temp, rainfall etc.) of 2022 and 2023 separately and then compile them in one graph.

Comment [S6]: Why you write them here.....? Either they are not suited in introduction section?

Experimental Details

The present studies were carried out at the Department of Horticulture, School of Agricultural Sciences, Career Point University, Kota (Rajasthan) during the year 2022 and 2023. 12 varieties of okra *viz.*ParbhaniKranti, ParbhaniBhindi, ArkaAnamika, Shahiba, Shan, No. 55, Harita, Jhilmil, No. 64, Sonal, Shakti, and Punjab Selection were evaluated in randomized block design, replicated thrice.Raised bed planting system at 60 x 30 cm spacing was adapted to grow the crop.The FYM 20 tonnes and RDF 150:100:100 NPK applied per hectare respectively, as basal dose.

Measurement of the yield parameters

Fruit yield per plant (kg) was calculated from picking of fresh marketable fruits were done from the observational plants separately throughout the harvesting period at an interval of 3 days. It was totaled and then average yield per plant was worked out for each genotype.The fruits yield per plot (kg) harvested from all the plants in each plot including 5 observational plants were weighted at each harvest. The yield of fruit per hectare was obtained from yield per plot by multiplying with the factor.

$$\text{Fruit yield per ha (q)} = \frac{\text{Fruit yield per plot (kg}}{\text{Gross plot area (m}^2\text{)}} \times \frac{10000\ \text{m}^2}{100}$$

Measurement of the quality parameters

Colour of fruit was observed by visual observation and categorized in dark green light green and yellow green.The length of fruit was measured from randomly selected five fruits from every genotype with the help of scale and then average was recorded.The widths of the randomly selected fruits were recorded with different position such as at base, at middle and at top with the help of Vernior calipers and average was worked out.The average weight of fruit was calculated as weight of fruit in gram from five fruits from observational plants were selected randomly from each treatment and weighed. Total soluble solids content of the fruit was determined by using a digital hand refractometer.The acidity was determined bythe method (A.O.A.C. 1990).Ascorbic acid content of juice was determined by(A.O.A.C. 1990). The mucilage was extracted the method given by Ahiakpa, *et al*. (2014).

Comment [S7]: In start of sentence never use digits

Comment [S8]: From where you get these varieties, source of germplasm?

Comment [S9]: Here you write the fertilizers application, if you make a separate section of "agronomical practices" and write all the applications that you provide.

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Measurement of the economic feasibility

Cost of cultivation will be taken into account by calculating total expenses incurred for inputs such as seeds, fertilizers and chemicals, to reach particular level of output. Gross return calculated as the total amount of revenue that can be obtained by the yield of okra during the total life time of the plants. The gross returns calculated by considering the prices of green fruit prevailing at the time of harvest. The net returns calculated by deducting the cost of cultivation from the gross returns. The sale rate of okra was Rs. 25/kg.

Net returns (Rs.) = Gross income/ha (Rs.) – Total cost of cultivation/ha (Rs.)

The benefit cost ratio will be calculated as follows;

$$\text{B:C ratio} = \frac{\text{Gross returns (Rs. ha-1)}}{\text{Cost of cultivation (Rs. ha-1)}}$$

RESULTS

Yield parameters of okra

The fruit yield was found significantly different during the both years 2022 and 2023. Significant differences were observed amongst the different varieties ofokra with respect to fruit yield per plant which ranged from 0.36 to 0.53 kg. Thehighestfruit yield per plant was recordedin "Punjab Selection" (0.53 kg) which wassignificantlyhighest overrestofthevarietiesbutatparto"Sonal" (0.49 kg),whereastheminimumfruit yield per plant (0.36 kg) wasfoundin"ParbhaniBhindi."The fruit yield per plot was found significantly different during the both years 2022 and 2023. Significant differences were observed amongst the different varieties ofokra with respect to fruit yield per plot which ranged from 9.48 to 11.68 kg. Themaximumfruit yield per plot was recordedin "Punjab Selection" (11.68 kg) which wassignificantlyhighest overrestofthevarietiesbutatparto"Sonal" (9.48 kg),whereastheminimumfruit yield per plot wasfoundin"ParbhaniBhindi"(11.08 kg).Themaximummean fruit yield per hectare was recordedin "Punjab Selection" (124.30 q) which wassignificantlyhighest overrestofthevarietiesbutatparto"Sonal" (121.52 q),whereastheminimumfruit yield per hectare wasfoundin"ParbhaniBhindi"(103.74 q).

Quality parametersof okra

The fruit length was found significantly different during the both years 2022 and

Comment [S14]: You should compare both year data on "Biplot software". And apply "correlation analysis" software and these software will give you more suited and better performing variety.

2023. Significant differences were observed amongst the different varieties ofokra with respect to fruit length which ranged from 11.06 to 13.07 cm. Themaximumfruit length was recordedin“Punjab Selection” (13.07 cm) which wassignificantlyhighest overrestofthevarietiesbutatparto“Sonal” (12.72 cm),whereastheminimumfruit length wasfoundin“Parbhanibhindi”(11.06 cm).The maximumfruit diameter was recordedin “Punjab Selection” (3.77 cm) which wassignificantlyhighest overrestofthevarietiesbutatparto“Sonal” (2.97 cm),whereastheminimumfruit diameter wasfoundin“Parbhanibhindi”(2.69 mm).The fruit weight was found significantly different during the both years 2022 and 2023. Significant differences were observed amongst the different varieties ofokra with respect to fruit weight which ranged from 12.96 to 15.20 g. Themaximum meanfruit weight was recordedin “Punjab Selection” (15.56 g) which wassignificantlyhighest overrestofthevarietiesbutatparto“Sonal” (15.20 g),whereastheminimumfruit weight (12.96 g) wasfoundin“ParbhaniBhindi”(Table 1).The fruits of all the okra varieties were observed for qualitativetrait study of fruit colour and fruits of all the varieties were found to bedarkgreenincolourexcept“Shan, No.55 and Harita” whichwerelight greenincolour(Table 1).

The TSS in okra was found significantly different during the both years 2022 and 2023. Significant differences were observed amongst the different varieties ofokra with respect to TSS in which ranged from 1.60 to 3.18 ^{0}B. Themaximummean TSS in okra was recordedin “Punjab Selection” (3.18 ^{0}B) which wassignificantlyhighest overrestofthevarietiesbutatparto“ArkaAnamika” (2.86 ^{0}B),whereastheminimum TSS in okra wasfoundin“No. 64”(1.60 ^{0}B).Theminimum meanacidity percentage in okra was recordedin “Punjab Selection” (0.22 %) which wassignificantlylowest overrestofthevarietiesbutatparto“ArkaAnamika” (0.23 %),whereasthemaximumacidity percentage in okra wasfoundin“No. 64”(0.44 %).Thehighestascorbic acid was recordedin “Punjab Selection” (19.64 mg/100g) which wassignificantlyhighest overrestofthevarietiesbutatparto“ArkaAnamika” (18.37 mg/100g),whereastheminimumascorbic acid wasfoundin“No. 64”(14.82 mg/100g).The mucilage content was found significantly different during the both years 2022 and 2023. Significant differences were observed amongst the different varieties of okra with respect to mucilage content which ranged from 0.71 to 0.91 per cent. The highest mean mucilage content was recorded in “Punjab Selection” (0.91%) which was significantly highest over rest

of the varieties but at par to “ArkaAnamika” (0.85%), whereas the minimum mucilage content was found in “No. 64” (0.71 %).

Economic feasibility of okra

Higher money value and less cost of cultivation are desirable characters for getting higher returns. Hence, economics of the genotypes was worked out.It is revealed from the data obtained that a significantly highest marketable fruit yield of 124.15 in 2022 and 124.45q/ha in 2023 was found under variety “Punjab Selection”. The net return of Rs 248575 Rs/ha and 249325 Rs/ha along with benefit cost ratio 5.02 and 5.03 in 2022 and 2023 respectively was obtained under okra variety “Punjab Selection” followed by “Sonal” gave fruit yield 121.37 and 121.67 q /ha and net return of Rs 2,41,625/ha and 2,42,375 with benefit cost ratio of 4.91 and 4.9203 in 2022 and 2023 respectively. While, the lowest marketable fruit yield 103.59 and 103.89 q/ha and net return of Rs 1,97,175/ha and 1,97,925/ha along with benefit cost ratio 4.19 and 4.20 03 in 2022 and 2023 respectively, was recorded in genotype “ParbhaniBhindi” (Table 3 & 4).

DISCUSSION

Comment [S15]: In your discussion section where you compare your results with past studies, why you can’t demonstrated the phenotypic/genotypic correlation analysis, which is the main point in your study.

Significant differences were observed among the different varieties of okrawith respect to the physical parameters *viz.* fruit length, fruitdiameter, fruit weight and colour of okra fruit and yield parameters *viz.* fruit yield per plant, fruit yield perplotand fruityield per hectare. Chemical parameters *viz.* TSS, acidity, ascorbic acid and mucilage percentage.

The maximum fruit length at marketable stage was found in “Punjab Selection” (13.07 cm) while theminimumfruit length wasfoundin“Parbhanibhindi”(11.06 cm). The significantdifferences for fruit length in the varieties may be due to their geneticmakeupleadingtodifferentialsynthesis,translocationandaccumulationofphotosynthates in the sink (fruit). Similar results have been reported by Singh *et al.* (2013), Yonas*etal.*(2014), Chandramouli*etal*. (2016), Kumar*etal.* (2017) and Rajesh*etal*. (2018).

The thickest fruits (3.77 cm diameter) were recorded in ‘ArkaAnamika’,whilethe thinnest(2.69 cm)in‘ParbhaniKranti’.Thefruitsize (lengthanddiameter) of okra at marketable maturity stage is an important varietal characteristicthat is primarily governed by its

genotypic constitution and secondarily by availabilityof water and nutrients coupled with influence of the growing climate. The differencesobtainedinfruitdiameteramongstthevarietiesandhybridsofokracouldbeattributed to their genetic makeup and the prevailing environmental factors. Similarresultshavebeen reported byAkotkar*et al.* (2010)and Chandra *etal.* (2014).

Themaximum mean fruitweightatmarketablematuritystagewasrecordedin'Punjab Selection' (15.56 g), while the minimum mean fruit weight in 'ParbhaniBhindi'(12.96 g). The observed variation in fruit weight amongst the varieties and hybrids ofokra might be due to their genetic makeup governing the fruit size and sink-sourcerelationship in diversion of photosynthates to the fruit. The results find support fromDeepanshuand Shamad (2017) and Kumar*et al.*(2017).

The fruits of all the okra varieties were observed for qualitativetrait study of fruit colour and fruits of all the varieties and hybrids were found to bedarkgreenincolourexcept"Shan, No.55 and Harita" whichwere light greenincolour.

Thehighest mean fruit yield per plant was recordedin "Punjab Selection" (0.53 kg)whereastheminimumfruit yield per plant wasfoundin"ParbhaniBhindi"(0.36 kg). The yield per plant had high positively genotypic and phenotypic correlationwith high number of branches per plant with more number of nodes on the plant,providing the site for fruit production. The observed variation in yield per plant amongst the varieties of okra might be due to theirgenetic makeup governing the number and size of fruits due to varying and sink-source relationships. The findings lendsupport fromAkotkar*etal*. (2010) and Bagwale*et al.* (2016)for fruityield per hectare; Mishra *et al.* (2015), Darshan*et al*. (2016)and Kumari*etal*. (2019) for fruit yield per plant and fruit yield per plot;

The maximum mean fruit yield per plot (11.68 kg) and estimated fruit yield per hectare(124.30 q) were recorded in 'Punjab Selection' whereas the lowest fruit yield per plot(11.08 kg) and per hectare (103.74 q) were recorded in 'ParbhaniBhindi'. It is evidentfrom the results that fruit yield per plant haddirectly influenced the fruit yield per unit area which had high positive correlationwith fruit yield per plant for genotypic as well as phenotypic correlation. Similarresults have been reported by Chandra *et al*. (2014), Deepanshu and Shamad (2017)andChandramouli*et al*.(2016).

The minimum mean acidity percentage in okra was recordedin "Punjab Selection" (0.22 %) which wassignificantlylowest overrestofthevarietieswhile themaximumacidity percentage in okra wasfoundin"No. 64"(0.44 %). Similarly maximum mean TSS in okra was recordedin "Punjab Selection" (3.18 ^{0}B) which wassignificantlyhighest overrestofthevarieties whereastheminimum mean TSS in okra wasfoundin"No. 64"(1.60 ^{0}B). It is evidentfrom the results directly influenced the chemical quality of okra might be due to for genotypic correlation. ThefindingofBendale*etal.*(2003),Yonas*etal.* (2014)andPriyanka*et al.*(2018)weresimilar tothepresent findings.

The ascorbic acid was found significantly different during the both years 2022 and 2023. Thehighest ascorbic acid was recordedin "Punjab Selection" (19.64 mg/100g) which wassignificantlyhighest overrestofthevarieties whereastheminimumascorbic acid wasfoundin"No. 64"(14.82 mg/100g). On the other hand highest mucilage content was recordedin "Punjab Selection" (0.91 %) whereastheminimummucilage content wasfoundin"No. 64"(0.71 %). It is evidentfrom the results directly influenced the chemical quality of okra mght be due to for genotypic correlation. Similarresults have been reported by Chandra *et al*. (2014), Deepanshu and Shamad (2017)andChandramouli*et al*.(2016).

It is revealed from the data obtained that a significantly highest marketable fruit yield of 124.15 in 2022 and 124.45 q/ha in 2023. The net return of Rs 248575 Rs/ha and 249325 Rs/ha along with benefit cost ratio 5.02 and 5.05 in 2022 and 2023 respectively was obtained under okra variety "Punjab Selection" followed by "Sonal" gave fruit yield 121.37 and 121.67 q /ha and net return of Rs 2,41,625/ha and 2,42,375 with benefit cost ratio of 4.91 and 4.9203 in 2022 and 2023 respectively. While, the lowest marketable fruit yield 103.59 and 103.89 q/ha and net return of Rs 1,97,175/ha and 1,97,925/ha along with benefit cost ratio 4.19 and 4.20 in 2022 and 2023 respectively, was recorded in genotype "ParbhaniBhindi". It is evidentfrom the results that maximum benefit cost ratio haddirectly influenced due to the fruit yield per unit area which had high positive correlation with economic feasibilityfor genotypic as well as phenotypic correlation. Similarresults have been reported by Chandra *et al*. (2014), Deepanshu and Shamad (2017)andChandramouli*et al*.(2016).

CONCLUSION

Based on the overall effect the variety Punjab Selection was highest in terms ofphysical, chemical and yieldcharacteristics Hence, variety Punjab Selection may be considered worth for better harvest of the crop under Hadoti region of South-East Rajasthan.

Comment [S16]: Correction needed here.

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Comment [S17]: Is format is okay?

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Table 1 Performance of different varieties of okra with respect tophysical parameters

Treatment	Varieties	Fruit length (cm)			Fruit diameter (cm)			Fruit weight (cm)		
		2022	2023	Pooled	2022	2023	Pooled	2022	2023	Pooled
T_1	ParbhaniKranti	11.98	12.41	12.20	3.05	3.26	3.16	13.50	13.80	13.65
T_2	ParbhaniBhindi	10.84	11.27	11.06	2.58	2.79	2.69	12.81	13.11	12.96
T_3	ArkaAnamika	12.42	12.85	12.64	3.42	3.63	3.53	14.95	15.25	15.10
T_4	Shahiba	12.06	12.49	12.28	3.17	3.38	3.28	14.92	15.22	15.07
T_5	Shan	11.14	11.57	11.36	2.63	2.84	2.74	13.35	13.65	13.50
T_6	No. 55	11.53	11.96	11.75	2.71	2.92	2.82	13.75	14.05	13.90
T_7	Harita	11.43	11.86	11.65	2.81	3.02	2.92	13.49	13.79	13.64
T_8	Jhilmil	11.56	11.99	11.78	2.90	3.11	3.01	13.67	13.97	13.82
T_9	No. 64	12.13	12.56	12.35	2.53	2.74	2.64	13.86	14.16	14.01
T_{10}	Sonal	12.50	12.93	12.72	3.54	3.75	3.65	15.05	15.35	15.20
T_{11}	Shakti	12.46	12.89	12.68	2.86	3.07	2.97	13.93	14.23	14.08
T_{12}	Punjab Selection	12.85	13.28	13.07	3.66	3.87	3.77	15.41	15.71	15.56
	SEm±	**0.33**	**0.34**	**0.35**	**0.24**	**0.17**	**0.16**	**0.47**	**0.51**	**0.35**

	C.D.($p_{=}0.05$)	**0.98**	**1.01**	**1.05**	**0.72**	**0.49**	**0.48**	**1.35**	**1.52**	**1.05**

Table 2 Performance of different varieties of okra with respect toyield parameters

Treatment	**Varieties**	**Yield per plant (kg)**			**Yield per plot (kg)**			**Yield per hectare (q)**		
		2022	**2023**	**Pooled**	**2022**	**2023**	**Pooled**	**2022**	**2023**	**Pooled**
T_1	ParbhaniKranti	0.41	0.43	0.42	9.37	9.69	9.53	104.15	104.45	104.30
T_2	ParbhaniBhindi	0.42	0.44	0.36	9.32	9.64	9.48	103.59	103.89	103.74
T_3	ArkaAnamika	0.50	0.52	0.48	9.97	10.29	10.13	110.81	111.11	110.96
T_4	Shahiba	0.46	0.48	0.47	9.72	10.04	9.88	108.04	108.34	108.19
T_5	Shan	0.36	0.38	0.37	9.51	9.83	9.67	105.70	106.00	105.85
T_6	No. 55	0.38	0.40	0.39	9.40	9.72	9.56	104.48	104.78	104.63
T_7	Harita	0.41	0.43	0.42	9.99	10.31	10.15	111.04	111.34	111.19
T_8	Jhilmil	0.40	0.42	0.41	9.92	10.24	10.08	110.26	110.56	110.41
T_9	No. 64	0.38	0.40	0.39	10.12	10.44	10.29	112.48	112.78	112.63
T_{10}	Sonal	0.48	0.50	0.49	10.92	11.24	11.08	121.37	121.67	121.52
T_{11}	Shakti	0.34	0.43	0.41	10.23	10.55	10.39	113.70	114.00	113.85
T_{12}	Punjab Selection	0.52	0.54	0.53	11.17	11.49	11.67	124.15	124.45	124.30
	SEm±	**0.04**	**0.02**	**0.03**	**0.33**	**0.35**	**0.51**	**2.01**	**1.66**	**2.44**
	C.D.($p_{=}0.05$)	**0.11**	**0.06**	**0.09**	**0.98**	**1.05**	**1.50**	**5.90**	**4.89**	**6.59**

Table 3 Performance of different varieties of okra with respect to colour and chemical parameters

Treatment	Varieties	Fruit colour			Acidity (%)			TSS (B^0)		
		2022	2023	Pooled	2022	2023	Pooled	2022	2023	Pooled
T_1	ParbhaniKranti	Dark green	Dark green	Dark green	0.35	0.36	0.36	2.52	2.67	2.60
T_2	ParbhaniBhindi	Dark green	Dark green	Dark green	0.36	0.37	0.37	2.67	2.82	2.75
T_3	ArkaAnamika	Dark green	Dark green	Dark green	0.22	0.23	0.23	2.78	2.93	2.86
T_4	Shahiba	Dark green	Dark green	Dark green	0.28	0.29	0.29	1.92	2.07	2.00
T_5	Shan	Light green	Light green	Light green	0.23	0.24	0.24	1.70	1.85	1.78
T_6	No. 55	Light green	Light green	Light green	0.37	0.38	0.38	1.57	1.72	1.65
T_7	Harita	Light green	Light green	Light green	0.25	0.26	0.26	1.82	1.97	1.90
T_8	Jhilmil	Dark green	Dark green	Dark green	0.33	0.34	0.34	2.32	2.47	2.40
T_9	No. 64	Dark green	Dark green	Dark green	0.43	0.44	0.44	1.52	1.67	1.60
T_{10}	Sonal	Dark green	Dark green	Dark green	0.34	0.35	0.35	2.43	2.58	2.51
T_{11}	Shakti	Dark green	Dark green	Dark green	0.32	0.33	0.33	1.97	2.12	2.05
T_{12}	Punjab Selection	Dark green	Dark green	Dark green	0.21	0.22	0.22	3.10	3.25	3.18

	SEm±	**-**	**-**	**-**	**0.04**	**0.03**	**0.01**	**0.22**	**0.16**	**0.24**
	C.D.(p=0.05)	**-**	**-**	**-**	**0.11**	**0.10**	**0.04**	**0.65**	**0.48**	**0.72**

Table 4 Performance of different varieties of okra with respect to chemical parameters

Treatment	**Varieties**	**Ascorbic Acid (mg/100g)**			**Mucilage (%)**		
		2022	**2023**	**Pooled**	**2022**	**2023**	**Pooled**
T_1	ParbhaniKranti	17.47	17.77	17.62	0.77	0.88	0.83
T_2	ParbhaniBhindi	17.82	18.12	17.97	0.78	0.89	0.84
T_3	ArkaAnamika	18.22	18.52	18.37	0.79	0.90	0.85
T_4	Shahiba	15.62	15.92	15.77	0.70	0.81	0.76
T_5	Shan	15.07	15.37	15.22	0.65	0.76	0.71
T_6	No. 55	16.82	17.12	16.97	0.64	0.75	0.70
T_7	Harita	15.37	15.67	15.52	0.75	0.86	0.81
T_8	Jhilmil	14.37	14.67	14.52	0.63	0.74	0.69
T_9	No. 64	14.67	14.97	14.82	0.67	0.78	0.73
T_{10}	Sonal	17.12	17.42	17.27	0.76	0.87	0.82
T_{11}	Shakti	15.92	16.22	16.07	0.74	0.85	0.80
T_{12}	Punjab Selection	19.42	19.72	19.57	0.85	0.96	0.91
	SEm±	**0.50**	**0.80**	**0.44**	**0.02**	**0.04**	**0.02**
	C.D.(p=0.05)	**1.46**	**2.33**	**1.31**	**0.06**	**0.12**	**0.08**

Table.5Economicsofdifferentvarietiesforokra (2022).

Treatments ymbol	Treatments	Fruityield (q/ha)	Cost of Cultivation(Rs/ha)	GrossReturns (Rs/ha)	NetReturns (Rs/ha)	B:C ratio
T_1	ParbhaniKranti	104.15	61800	260375	198575	4.21
T_2	ParbhaniBhindi	103.59	61800	258975	197175	4.19
T_3	ArkaAnamika	110.81	61800	277025	215225	4.48
T_4	Shahiba	108.04	61800	270100	208300	4.37
T_5	Shan	105.70	61800	264250	202450	4.28
T_6	No. 55	104.48	61800	261200	199400	4.23
T_7	Harita	111.04	61800	277600	215800	4.49
T_8	Jhilmil	110.26	61800	275650	213850	4.46
T_9	No. 64	112.48	61800	281200	219400	4.55
T_{10}	Sonal	121.37	61800	303425	241625	4.91
T_{11}	Shakti	113.70	61800	284250	222450	4.60
T_{12}	Punjab Selection	124.15	61800	310375	248575	5.02

Table.6Economicsofdifferentvarietiesforokra (2023).

Treatments ymbol	Treatments	Fruityield (q/ha)	Cost of Cultivation(Rs/ha)	GrossReturns (Rs/ha)	NetReturns (Rs/ha)	B:C ratio
T_1	ParbhaniKranti	104.45	61800	261125	199325	4.23
T_2	ParbhaniBhindi	103.89	61800	259725	197925	4.20
T_3	ArkaAnamika	111.11	61800	277775	215975	4.49
T_4	Shahiba	108.34	61800	270850	209050	4.38
T_5	Shan	106.00	61800	265000	203200	4.29
T_6	No. 55	104.78	61800	261950	200150	4.24
T_7	Harita	111.34	61800	278350	216550	4.50
T_8	Jhilmil	110.56	61800	276400	214600	4.47
T_9	No. 64	112.78	61800	281950	220150	4.56
T_{10}	Sonal	121.67	61800	304175	242375	4.92
T_{11}	Shakti	114.00	61800	285000	223200	4.61
T_{12}	Punjab Selection	124.45	61800	311125	249325	5.05