Comparative Evaluation of Growth and Yield Parameters of Different Varieties of Okra in Lamjung, Nepal

ABSTRACT

Aims: This research aimed to evaluate the performance of ~~various~~ different okra varieties in Lamjung district, Nepal, with the objective of identifying high-yielding cultivars that could enhance productivity and profitability for local farmers.
Study design: The study employed a randomized complete block design (RCBD) with seven okra varieties ~~(as~~ treatments~~)~~ and three replications per ~~variety~~treatment, totaling 21 plots.
Place and Duration of Study: The experiment was conducted in Beshishar, Lamjung District, Nepal. Data collection and experimentation were carried out over the growing season of okra.
Methodology: Growth and yield parameters including plant height, number of leaves and primary branches per plant, days to first flowering, number of nodes at first flowering, number of pods per plant, pod length, pod weight, yield per plant, and yield per hectare were measured and recorded from selected plants within each plot. Statistical analysis was ~~conducted~~ done to compare the performance of different varieties.
Results: Significant variations were observed among the okra varieties for growth and yield parameters. For instance, F1 Glory exhibited the highest plant height (84.80 cm), number of leaves (26.60), and yield per hectare (9.02 t/ha), while Parvati showed the lowest values for these parameters. Days to first flowering ranged from 56.13 to 64.40 days across varieties.
Conclusion: The findings indicate that varieties ~~*like viz.,*~~ F1 Glory and Arka Anamika excelled in yield and growth parameters in Lamjung district. These varieties could enhance local productivity and profitability, addressing current challenges in okra cultivation. This study offers valuable insights for selecting suitable okra varieties, enhancing agricultural sustainability and economic outcomes.

Keywords: Okra varieties, Growth characteristics, plant height, Yield parameters, Lamjung district

1. INTRODUCTION

Okra (*Abelmoschus esculentus*), a self- pollinating annual plant, is a well-known vegetable crop that has in agricultural, culinary, and nutritional value[1]. ~~Okra~~ It requires warm temperatures of 20-30 degrees Celsius[2] and originated from Ethiopia and Sudan, [1]. ~~Okra~~ It is a versatile vegetable crop due to its various uses of the fresh leaves, buds, flowers, pods, stems and seeds [3] that can be eaten in many ways, ~~*like viz.,*~~ boiled, fried, or cooked, and is soups, stews, and pickles [4]. It is a nutrient-rich vegetable providing 1.9 g protein (contains both lysine and tryptophan amino acids), 0.2 g fat, 6.4 g carbohydrates, and 1.2 g fiber per 100 g of edible portion, along with essential vitamins and minerals [5]; [6]). It has antioxidant activity [7]and health benefits such as improved digestive health, potential management of cardiovascular disease, type 2 diabetes and protective food additive against inflammatory gastric diseases [8][9] & [10]. Furthermore, nearly every part of the plant is covered with unicellular trichomes for the protection form pests like leafhoppers

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[11]. ~~Okra seeds~~Its seeds are a source of oil used as coffee substitute which can be pulverized to replace aluminum salts in the process of purifying water [12].

As a result of growing population and rapid urbanization, vegetable demand is increasing throughout the world but the production potential of vegetable and vegetable seeds of our country is not satisfying. Global okra production is estimated to be around 10,822,249 tons in 2021. ~~according to[13],~~ India is leading producer with 6,466,000 tons followed by Nigeria and Mali [13]. Total production of okra in Nepal was 11 metric tons under the area 9,397 hectare with the productivity of 11.95 t/ha [14] The main reasons of unsatisfactory yield of okra across the country ~~are~~ is use~~s~~ of low yielding varieties with poor agronomic traits [15], absence of location-specific varieties[16], poor seed quality [17] and uses of seeds from previous harvest [15]~~)~~; therefore, for the identification of best variety that suit existing environmental conditions, researches and experimental trail~~s~~ ~~is~~ are needed in many parts of the country. Moreover, ~~according to [18],~~ foundation of raising productivity is the use of suitable genotype with high yield potential and standard traits [18]. The major factors that ultimately determine the overall production of the variety or cultivar of okra vary greatly between genotypes, including fruit number, fruit length, fruit weight, and fruit yield per plant [19].

The purpose of this research ~~is~~ was to evaluate the performance of various okra varieties in the Lamjung district of Nepal to identify high-yielding cultivars that can enhance productivity and profitability for local farmers. Given the current low productivity and challenges faced in okra cultivation in the region, this study aims to address the lack of location-specific varieties and improve the adoption of recommended practices. By assessing growth and yield parameters, the research seeks to provide valuable insights and practical recommendations for selecting the most suitable okra varieties, ultimately helping farmers to optimize their resources, increase their income, and contribute to meeting the local vegetable demand more effectively.

2. MATERIAL AND METHODS

2.1 Experimental site

The experiment was conducted in Beshishar, Lamjung District, Nepal, located at a latitude of 28°48' N and a longitude of 84°28' E, with an altitude of 600 meters above sea level.

2.2 Climatic condition of the research site

Lamjung has a sub-tropical humid climatic condition where temperatures typically range between 9 ℃ and 22 ℃ through the year, but rarely can drop to -3 ℃ or can rise to as high as 29 ℃. The average annual precipitation amounts to about 5961 mm (Source: Weather and Climate- The Global historical Weather and Climate Data 2023).

2.3 Experimental detail

2.3.1 Experimental design

The experiment was conducted using a randomized complete block design (RCBD) with seven treatments and three replications, resulting in a total of 21 plots. Each plot had 4 rows with 5 plants per row, ~~total~~totaling 20 plants per plot. From each plot, 5 inner plants were selected as samples.

2.3.2 Experimental materials

Following are the 7 varieties that ~~are~~ were used as treatments in the research~~. with 3 replications.~~

Table 1: List of varieties used in the research

Treatment Number	Name of variety	Germination %	Physical purity	Genetic Purity	Producer Company/ Organizations
1.	Arka Anamika	65 %	98%	98%	NARC, Kaski
2	Parvati	65 %	98%	98%	NARC, Kaski
3.	Venus	65%	99%	95%	UPL Ltd, India
4.	S-51	65 %	98%	98%	Mayco Pvt. Ltd, India

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5.	F1 Glory	70 %	98 %	98 %	Rizwan Seeds Co. India
6.	Rajrani	65%	98%	98%	Shatabdi Seeds Pvt. Ltd. India
7.	Bhindi-F1	70 %	97%	98%	Prime Seed Company Pvt. Ltd, Kaski

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2.3.4 Field layout

Each individual plot measured 1.8 meters in length and 1.5 meters in breadth. The spacing between plants was 45 cm, and the spacing between rows was 30 cm, with each plot containing 4 rows of 5 plants each. The net experimental plot area was 2.7 square meters, with a spacing of 50 cm between treatments and 1 meter between replications. The total area for the research was 145.7 square meters.

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Table 2: RCBD design of field

R_1T_2	~~R_2T_3~~	~~R_3T_5~~
~~R_1T_4~~	~~R_2T_5~~	~~R_3T_1~~
~~R_1T_6~~	~~R_2T_7~~	~~R_3T_4~~
~~R_1T_3~~	~~R_2T_2~~	~~R_3T_6~~
~~R_1T_1~~	~~R_2T_4~~	~~R_3T_7~~
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~~R_1T_7~~	~~R_2T_1~~	~~R_3T_2~~

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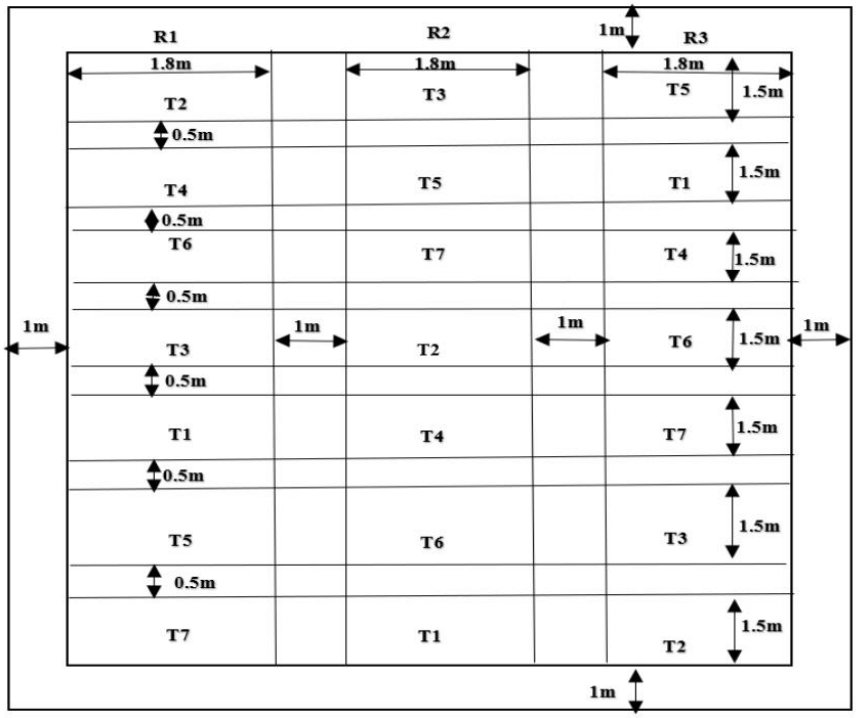

Figure 1: Layout of field showing spacing and randomization of treatments

2.4 Agronomic management

Field preparation, layout, manure and fertilizer application, seed treatment, irrigation, weeding, pest management, and harvesting were ~~conducted~~ done according to standard practices. All procedures were implemented to ensure optimal growing conditions and effective management throughout the experiment.

2.5 Observation and data recording

Five plants were selected randomly from inner row of each plot for collection of data. Plots were tagged by A4 paper laminated with plastic that reflects treatment and variety. The data regarding the ~~following~~ yield and ~~yield~~ its contributing characters ~~were considered for data~~ collected~~ion~~:

2.5.1 Growth parameters

Plant height was ~~measured~~ recorded on five selected plants from the inner observation area ~~starting a~~from~~t~~ 40 days after sowing (DAS) and continued at 10-day intervals, with the final average height was calculated for each plot. The number of fully opened leaves per plant was counted from selected plants at 10-day intervals starting from 40 DAS, and the mean was determined. Additionally, the total number of primary branches per plant was recorded at the final harvest stage from five selected plants, and their average was calculated.

2.5.2 Reproductive parameters

The number of nodes at which the first flower appeared was recorded by counting ~~this occurrence~~ on five individual plants from each plot, and the average was calculated. Days to first flowering (anthesis) ~~were~~ was observed on five randomly selected plants, and ~~with~~ the average number of days taken to reach this ~~stage~~ anthesis was recorded.

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2.5.3 Yield and Yield parameters

2.5.3.1 No of pods/plant

The number of pods ~~of~~ in the observational plants from each plot was recorded. It was calculated by the following formula:

$$\text{No of pods/plant} = \frac{total\ no\ of\ pods\ from\ 5\ sample\ plants}{5} \quad [15]$$ ~~)~~

2.5.3.2 Pod weight

The weight of pod was measured in gram (g) by using digital weighing machine. It was calculated by the following formula:

$$\text{Weight of pod} = \frac{total\ wt.\ of\ pods\ from\ 5\ sample\ plants}{total\ no\ of\ pods\ from\ 5\ sample\ plants} \quad [20]$$

2.5.3.3 Pod length

The length of pods was measured with a measuring scale from the neck of the pod to the bottom of harvested pods from inner observational plants of each plot and average was taken in centimeter (cm) [15]

2.5.3.4 Yield per plant (g/plant)

It was calculated in reference to inner observational plants. The total yield from inner observational plants divided by number of observational plants at final harvest gave the average yield/plant.

2.5.3.5 Yield

Pod yield/hectare was calculated out in metric ton (MT). It was ~~derived~~ calculated ~~with the help~~by multiplying ~~of the~~ average yield per plant ~~calculated as above multiplied~~ by number of plants accommodated in one hectare of land as follows: ~~.~~

$$\text{Yield (mt/ha)} = \frac{pod\ yield/plant \times 10000\ m2}{spacing(RR*PP)} \quad [20]$$

3. RESULTS AND DISCUSSION

Generally, all okra varieties showed significant degree of variation in terms of growth and yield parameters, including plant height, no of leaves per plant, no of primary branches per plant, pod length, pod weight, no of pods per plant, days to first flowering.

3.1 Comparative evaluation of growth parameters of different varieties

3.1.1 Plant height

The results showed there was significant difference on plant height at all growth stages as shown in table 3. At 40 DAS, Parvati variety recorded the highest mean significant height of 20.55 cm followed by Arka Anamika (1~~with the mean value of 1~~9.18 cm), while Bhindi-F1 recorded the lowest mean height of 14.24 cm. Furthermore, there was no significant difference between the varieties *viz.*, Arka Anamika (19.18 cm), F1 Glory (20.47 cm), and Parvati (20.55 cm) ~~were statistically similar~~. At 50 DAS, F1 Glory recorded the highest mean significant height of 55.77 cm followed by Bhindi-F1 (~~with the mean value of~~ 49.00 cm), ~~m~~ while S-51 variety recorded the lowest mean height of 28.08 cm. Additionally, Arka Anamika (38.9 cm) and Parvati (42.03 cm) were statistically similar with the mean value of 38.97 cm and 42.03 cms, respectively. Similar pattern of growth was also observed ~~on~~ at 60 and 70 DAS where there was significant increase in plant height. Highest mean significant height was recorded by F1 Glory with the mean value of 84.80 ~~cm~~ and 106.40 cms at 60 ~~DAS~~ and 70 DAS, respectively followed by Arka Anamika with the mean value of 74.67 cm and 88 cm at 60 DAS and 70 DAS respectively, whereas the lowest mean height was recorded in S-51 variety (48.26 cm) and Parvati variety (63.33 cm) at 60 DAS and 70 DAS, respectively.

Similar plant height variation was also observed by Biswas ~~A.~~ et al., & Dahal et al [15], [18] and according to them, these variations ~~is~~ were due to differences in nutrient uptake, fertilizer management, climatic factors, and plant density. Furthermore, the results also showed ~~alignment~~ in accordance with D. K. Mehata *et al* [19] but with the larger mean height value than ~~that of this experiment~~our treatments. This may be due to the differences in environmental conditions ~~as of~~

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Lamjung district as it experiences more frequent rainfall and lower average temperature than those of terai region resulting in slower growth rate over time.

Table 3: Mean of plant height at various stages of different okra varieties ~~of okra~~ tested in Lamjung, Nepal (2023)

Treatment	Plant height (cm)			
	40 DAS	50 DAS	60 DAS	70 DAS
Arka Anamika	19.18^{a}	38.97^{bc}	74.67^{ab}	88.00^{bc}
Parvati	20.55^{a}	42.03^{bc}	54.47^{cd}	63.33^{d}
Venus	17.89^{ab}	32.15^{cd}	58.71^{cd}	70.06^{d}
S-51	16.57^{ab}	28.08^{d}	48.26^{d}	73.60^{cd}
F1 Glory	20.47^{a}	55.77^{a}	84.80^{a}	106.40^{a}
Rajrani	16.23^{ab}	35.98^{cd}	52.83^{cd}	78.53^{bcd}
Bhindi-F1	14.24^{b}	49.00^{ab}	74.67^{bc}	93.80^{ab}
LSD (0.05)	4.02	9.95	12.20	15.08
SEm (±)	0.49	1.22	1.49	1.85
F-probability	<0.05	<0.001	<0.001	<0.001
CV	12.64	13.88	10.95	10.28
Grand mean	17.87	40.28	62.65	82.39

*Means followed by common letter(s) within column are non-significantly different based on DMRT at P=0.05; LSD, Least Significant Difference; SEM, Standard Error of Mean; CV, Coefficient of Variation; DAS, Days After Sowing; NS, Non-Significant, * significant at 5% level of significance, ** significant at 1% level of significance, *** significant at 0.1% level of significance*

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3.1.2 Number of leaves per plant

The nNumber of leaves per plant was ~~observed~~ recorded at 40, 50, 60 and 70 days after sowing, which ~~are~~ ranged ~~from~~ between 7 to 26.6 leaves (Table 4). At 40 DAS, highest mean number of leaves was observed on F1 Glory (13.13) followed by Arka anamika (11.37), whereas the lowest mean number of leaves was observed in Parvati (7.00) which was statistically similar with Bhindi-F1 (8.61) and S-51 (8.60). At 50 DAS, highest mean number of leaves was observed in F1 Glory (17.33) followed by Arka Anamika (14.06), whereas ~~lowest~~the lowest mean number of leaves was observed in Rajrani (8.00) which was statistically similar with Parvati (9.20). Similar pattern of results was observed ~~on~~ at 60 DAS and 70 DAS, where F1 Glory had highest number of leaves with the mean value of 22.53 and 26.60 at 60 DAS and 70 DAS, respectively followed by Arka Anamika with the mean value of 18.20 and 22.80 at 60 DAS and 70 DAS respectively whereas lowest mean number of leaves was observed in Parvati with the mean value of 10.73 and 13.60 at 60 DAS and 70 DAS respectively.

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Significant differences were ~~detected~~ observed in the mean number of leaves per plant of the different varieties. According to Dahal et al, this might be because of factors including soil fertility, growing season, and variety [15]. Similar result was also observed in different varieties of okra by Dimkpa et al. [21] Furthermore, Variations in the number of branches, plant height, and each hybrid's capacity for photosynthesis could all be contributing factors to the difference in the number of leaves per plant [22].

Table 4: Mean of number of leaves at various stages of different okra varieties ~~of okra~~ tested in Lamjung, Nepal (2023)

Treatment	No of leaves per plant			
	40 DAS	50 DAS	60 DAS	70 DAS
Arka-anamika	11.37^{ab}	14.06^{b}	18.20^{b}	22.80^{b}
Parvati	7.00^{c}	9.20^{d}	10.73^{c}	13.60^{e}

Venus	9.40^{bc}	13.13^{bc}	15.26^{b}	18.06^{d}
S-51	8.60^{c}	12.66^{bc}	15.13^{b}	20.26^{c}
Glory-F1	13.13^{a}	17.33^{a}	22.53^{a}	26.60^{a}
Rajrani	7.40^{c}	8.00^{d}	11.53^{c}	16.66^{d}
Bhindi-F1	8.61^{c}	11.53^{c}	18.06^{c}	23.67^{b}
LSD (0.05)	2.61	1.85	3.22	1.62
SEm (±)	0.32	0.23	0.39	0.19
F-probability	<0.01	<0.001	<0.001	<0.001
CV	15.69	8.46	11.38	4.50
Grand mean	9.36	12.28	15.92	20.24

*Means followed by common letter(s) within column are non-significantly different based on DMRT at P=0.05; LSD, Least Significant Difference; SEM, Standard Error of Mean; CV, Coefficient of Variation; DAS, Days After Sowing; NS, Non-Significant, * significant at 5% level of significance, ** significant at 1% level of significance, *** significant at 0.1% level of significance*

3.1.3 Number of primary branches per plant

~~From figure 2 t~~The maximum number of primary branches was observed in Venus ~~(with the mean value of~~ 3.90~~)~~ followed by F1 Glory (3.15), whereas minimum number of primary branches ~~was~~ were observed in Bhindi-F1 ~~(with the mean value of~~ 1.74~~)~~ (Fig.2). The variations in the ~~different~~ varieties could be ~~because variations~~due to ~~in~~their genetic makeup which might have an impact on the variations ~~in of~~ growth parameters [23]. Moreover, the variance in plant height and each hybrid's capacity for photosynthetic energy may be the cause of this variety in the number of branches per plant. The current study's outcome is consistent with the research conducted by Nwangburuka et al & Reddy et al [24], [25].

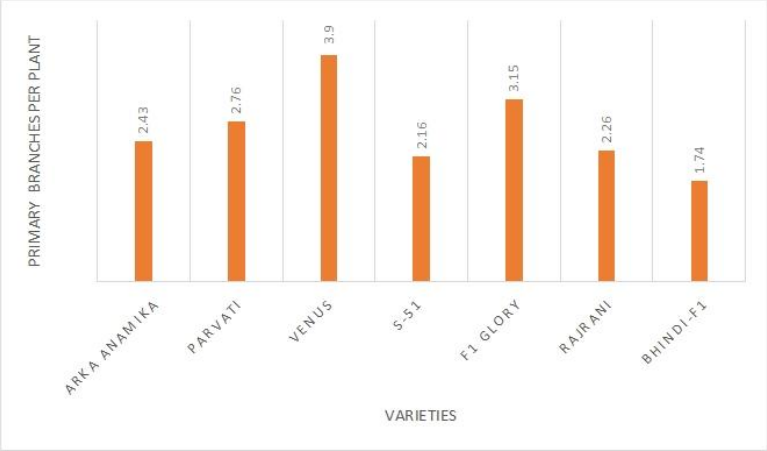

Figure 2: Number of primary branches ~~Graph showing of effect of~~in different okra varieties ~~on number of primary branches~~

3.2 Comparative evaluation of reproductive parameters of different varieties

3.2.1 Days to first flowering

Days to anthesis, were found to differ significantly throughout varieties (Table 5) which ranges from 56.73 to 64.40. The first flower opening was recorded in Parvati at 56.73 days, which was statistically identical with Arka Anamika (56.13 days) while late first opening of flower was recorded in F1 Glory at 64.40 days which was statistically identical with Bhindi-F1 (60.13 days) and Rajrani (60.53 days).

According to Biswas A. et al., the earliest flowering was observed in the BARI Dherosh 1 variety at 41.33 days, while the Kashi Kranti variety flowered at 42.33 days [15]. In comparison to these reports, the number of days required to

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first flowering was found to be greater than present findings. This may be due to the differences in environmental factors like rainfall, temperature and light intensity and duration. In addition, the genetic composition of its short vegetative phase, which promotes early flowering, may be the cause of the variation. Wakhande ~~R.~~ et al has reported findings that are comparable [26].

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3.2.2 Nodes at first flowering

Node at first flowering varied significantly among the varieties (Table 5). The variety Arka Anamika produced flower at 2.76 number of node (lowest number of nodes) and S-51 produced flower 3.90 number of nodes which is the highest number of nodes.

3.3 Comparative evaluation of yield and yield parameters of different varieties

3.3.1 Number of pods per plant

Number of pods per plant differ significantly among the varieties as shown in table 5. The highest number of pods per plant was recorded in the variety F1 Glory ~~(with the mean value of~~ 12.37~~)~~ followed by Arka Anamika ~~(with the mean value of~~ 10.83~~)~~. On other side lowest number of pods per plant was recorded in the variety Parvati ~~(with the mean value of~~ 7.36~~)~~. Furthermore, Venus (8.60), Rajrani (7.63) and S-51 (7.53) were statistically identical. This demonstrates that a rise in plant height, reduced intermodal length, and branch count also led to an increase in fruit production. The present study seems to agree with the results of Mehata et al & Rahman ~~K.~~ et al [19], [27] According to Dahal et al, this variation could be due to differences in genetic makeup and environmental effect [15].

3.3.2 Pod length (cm)

Pod length varies significantly among the varieties as shown in table-5. The longest length of pod was recorded in F1 Glory (14.94 cm) followed by Venus (13.94 cm) whereas shortest length of pod was recorded in S-51 (9.59 cm). Also, varieties Rajrani (9.85 cm), S-51 (9.59 cm) and Parvati (10.45 cm) were statistically identical. The current study's findings are consistent with those of Biswas A. et al., who determined that the greatest pod length measured 13.80 cm and the shortest was 9.13 cm. This variation in pod length may be because of difference in genetic makeup [28].

3.3.3 Weight per pod (gm)

Weight of pod varied significantly among the varieties as shown in table-5. The maximum weight per pod was recorded in F1 Glory (15.85 g) followed by Arka Anamika (14.49 g) whereas minimum weight per pod was recorded in S-51 (11.19 g). This variation may result from variations in the hybrids' vegetative growth, which affects photosynthesis and, ultimately, fruit weight (Dhall, Arora, Dhillon, & Bansal, 2003). The present findings are in agreement with the results of Dahal et al. who determined that greatest pod weight measured 15.90 gm and lowest was 9.80 gm [15].

3.3.4 Yield per plant (g/plant)

Yield per plant varied significantly among the varieties as shown in table 5. The highest yield per plant was recorded in F1 Glory (121.11 g) followed by Arka Anamika (114.14 g) whereas lowest yield per plant was recorded in Parvati (82.15 g). Similarly, Rajrani (92.13 g), Venus (90.94 g) and S-51 (85.97 g) were statistically identical. Biswas A. et al and Dahal et al. reported higher yield per plant than the results of present study [15], [18]. Increased branch count, fruit weight, and fruit yield per plant are all positively correlated [22]. Moreover, this may be because of differences in genetic makeup, management practices and shorter harvesting period. But the observed results are within the range of findings reported by Yadav et al. [29].

3.3.5 Yield (t/ha)

The highest yield per hectare was recorded in F1 Glory (9.02 t/ha) followed by Arka Anamika (8.45 t/ha) whereas the lowest yield per hectare was recorded in Parvati (6.08 t/ha). The observed outcomes coincide with the conclusion of Biswas A. et al., Dahal et al., & Rahman K. et al [15], [18], [27]. According to Dahal et al. these variations in yield in varieties is due to genetic factors, their interactions to environmental conditions, as all these varieties are tested under same soil, management and similar agro-climatic conditions [15].

Table 5: Mean of reproductive and yield parameters of different okra varieties ~~of okra~~ in Lamjung, Nepal (2023)

Treatment	No of pods per plant	pod length(cm)	weight / pod(gm)	Yield per plant (g)	Yield (t/ha)	Days to first flowering	Nodes to first flowering
Arka Anamika	10.83^{b}	12.00^{c}	14.49^{ab}	114.14^{ab}	8.45^{ab}	56.13^{bc}	2.76^{d}
Parvati	7.36^{d}	10.45^{d}	12.13^{bc}	82.15^{d}	6.08^{d}	51.73^{c}	3.20^{bcd}
Venus	8.60^{cd}	13.94^{b}	12.18^{bc}	90.94^{cd}	6.74^{cd}	58.57^{b}	3.60^{ab}
S-51	7.53^{cd}	9.59^{d}	11.19^{c}	85.97^{cd}	6.36^{cd}	55.73^{bc}	3.90^{a}
F1 Glory	12.37^{a}	14.94^{a}	15.85^{a}	121.77^{a}	9.02^{a}	64.40^{a}	3.46^{abc}
Rajrani	7.63^{cd}	9.85^{d}	13.44^{abc}	92.13^{cd}	6.82^{cd}	60.53^{ab}	3.03^{cd}
Bhindi-F_1	9.03^{c}	11.73^{c}	12.64^{bc}	99.67^{bc}	7.38^{bc}	60.13^{ab}	3.36^{bc}
LSD (0.05)	1.41	1.15	2.72	14.98	1.11	5.09	0.46
SEm (±)	0.17	0.14	0.33	1.84	0.14	0.63	0.06
F-test	<0.001	<0.001	<0.05	<0.001	<0.01	<0.01	<0.01
CV (%)	8.78	5.55	11.63	8.59	8.59	4.92	7.81
Grand mean	9.05	11.68	13.14	98.11	7.27	58.18	3.33

*Means followed by common letter(s) within column are non-significantly different based on DMRT at P=0.05; LSD, Least Significant Difference; SEM, Standard Error of Mean; CV, Coefficient of Variation; DAS, Days After Sowing; NS, Non-Significant, * significant at 5% level of significance, ** significant at 1% level of significance, *** significant at 0.1% level of significance*

4. CONCLUSION

The findings of this study show that there is significant variation in growth and yield parameters among different okra varieties. F1 Glory ~~exhibited~~ showed superior performance in terms of pod number, pod length, pod weight, and overall yield per plant and per hectare, while Parvati showed the ~~lowest~~ least performance~~values for these parameters~~. These findings imply that genetic makeup plays a crucial role in determining the productivity and growth characteristics of okra varieties, which can be further optimized through selective breeding and appropriate management practices. This paper makes a valuable contribution to understanding how different okra varieties perform under the same environmental and management conditions, highlighting the importance of selecting high-yielding varieties like F1 Glory for maximizing productivity. The novel aspect of this study is the comprehensive comparison of growth and yield parameters across multiple okra varieties, providing a clear indication of the best-performing varieties for specific agricultural contexts. However, the study is limited by its focus on a single growing season and location. Future research should involve multi-location trials and multiple growing seasons to validate these findings under diverse environmental conditions. Additionally, further studies could explore the underlying genetic factors contributing to the observed variations, potentially leading to the development of even more productive okra varieties.

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