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Research Article

Effect of Spacing and Different Levels of Phosphorus on Growth and Yield of Malepatan-1 Variety of Cowpea (*Vigna unguiculata* (Linn.) Walp.) in Dang District, Nepal

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The simplest strategy to boost cowpea production is to have an optimum fertilizer level and spacing. The study was performed to assess the effect of variable row spacing and phosphorus (P) levels on the growth and yield of cowpeas. The experiment was carried out using a split-plot design with three planting geometry as the main plot (15 cm × 30 cm, 30 cm × 30 cm, and 45 cm × 30 cm) and three P levels as subplots (20, 40, and 60 kg/ha), each replicated three times. The result demonstrated that P had a significant effect on the number of pods per plant at 100 days after sowing (DAS), pod length at 85 and 100 DAS, and yield of fresh pods. However, P did not significantly impact plant height or number of pods per plant at 70 and 85 DAS. The highest fresh pod yield (1.05 t/ha) and pod length at 85 and 100 DAS (20.33 and 21.16 cm, respectively) were observed at 60 kg/ha P level. Similarly, the highest number of pods per plant at 100 DAS (8.3) was recorded at a P level of 40 kg/ha, which was comparable to that obtained at a P level of 60 kg/ha (8.1). Also, the spacing showed a nonsignificant effect on any of the studied parameters, except for the number of branches per plant at 30 DAS. The 45 cm × 30 cm spacing resulted in the highest number of branches per plant at this stage (2.4).

1. Introduction

Grain legumes are important food crops for nutrition. In Nepal, grain legumes constitute 10.22% of cultivated land, with a seed yield of 0.85 t/ha [1]. The Grain Legumes Research Program of Nepal works with the Consultative Group on International Agricultural Research to improve the genetics of various legume crops, including lentils, chickpeas, pigeon peas, soybeans, mung beans, black gram, grass peas, faba beans, and cowpeas. Lentil is the largest contributor to pulse production in Nepal, making up more than 67% of total production and serving as the country's main export item [2]. Cowpea (*Vigna unguiculata* (Linn.) Walp.), a tropical and subtropical crop with origins in Africa [3], is adapted to hot, dry, sandy soils and is known for its ability to restore soil fertility [4, 5]. It is grown for its grain, used as a pulse crop, and for its immature pods, which are used as a vegetable. Cowpea is also used for green manuring and as animal forage due to its high nutrient content. It is a cheap source of protein for people in developing countries [6] like Nepal and is often referred to as a "hungry-season crop" due to its early maturity and ability to sustain cropping systems when grown in rotation with cereal crops [7]. In Nepal, cowpea productivity is low due to inappropriate fertilizer use and cultivation on marginalized and poor land [8]. However, the area and production of cowpeas in Nepal are increasing due to the availability of dual-purpose, short-duration varieties like Malepatan-1, which has a production potential of 0.8–1.0 metric tons and a maturity period of 75–90 days [9].

Phosphorus is critical to cowpea yield because it is reported to stimulate growth, initiate nodule formation as well as influence the efficiency of rhizobium–legume symbiosis. All growing plants require phosphorus for growth and development in significantly large quantities [10]. Phosphorus application significantly increased cowpea growth parameters such as plant height, leaf area/plant, number of branches and leaves/plant

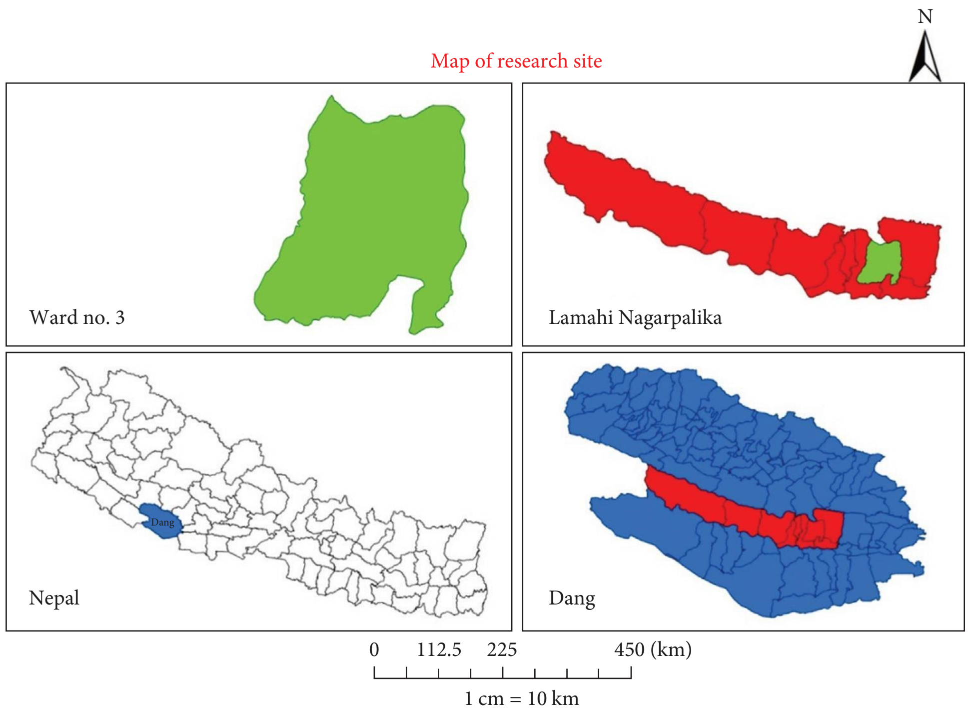

Figure 1: Map of experimental site.

and dry matter yield/plant, grain yield/ha, yield attributes, weight of 1,000 seeds, and crude protein content were also increased. High levels of phosphate induced greater leaf expansion and, consequently, large amounts of carbohydrates in the productive areas and increased the production of pods [11]. The different phosphorus levels had a significant influence on pod length, nodules per plant, nodules dry weight, pod per plant, fodder yield, and grain yield. About 90 kg/ha of SSP produced the highest fodder and grain yield among the other phosphorus levels [12].

Similarly, spacing plays an important role in maintaining an adequate plant population. The establishment of appropriate row spacing for maintaining the optimum plant population per unit area is an important prerequisite to obtaining maximum yield for any field crops [5]. Cowpea yield increases with an increase in plant populations per unit area; however, narrow spacing between the plant rows reduces the crop yield because of interplant competition [13]. Studies conducted by Nikhitha et al. [14] and Degefa et al. [15] concluded that the interaction between phosphorus and spacing has a significant effect on different yields, attributing characters of cowpea and mung bean. Similar research conducted by McBride [16] explains low plant space results in a higher soil-root interface that allows effective utilization of phosphorus available in the soil; however, excess P with low spacing levels may lead to toxicity, reducing the plant's ability to take up micronutrients, particularly iron and zinc, which then have a detrimental impact on yield and the growth. Furthermore, the response to fertilizer level and panting geometry is dependent on the genotypes under study. Thus, this experiment was conducted to study the effect of different levels of phosphorus application in varying planting geometry in cowpeas (cv. Malepatan-1) to select the best approach for obtaining maximum yields.

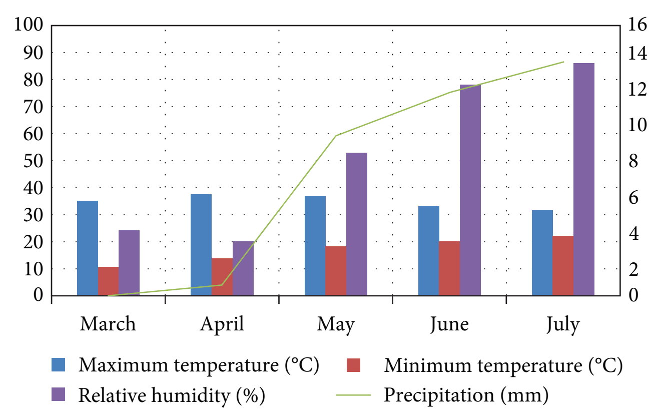

Figure 2: Average minimum and maximum temperature, precipitation, and relative humidity of experimental site during the research period.

2. Materials and Methods

2.1. Description of the Experiment Site. The experiment was conducted during the spring season to rainy season of 2021 (March–July) in the field of Bangau, Lamahi Municipality, ward no. 3 of Dang district (Figure 1). Geographic Location is 27.8620°N latitude and 82.5442°E longitude, at an elevation of 283 m above sea level. The area is characterized by tropical weather, abundant river and groundwater, and sandy loam soil with a pH of 5.5–6.0. The agro-meteorological data throughout the study period has been presented in Figure 2.

Table 1: Different treatment combinations used in experiment.

Treatment	Dose of phosphorous (kg/ha)	Spacing (cm)
T1	20	15 × 30
T2	40	15 × 30
T3	60	15 × 30
T4	20	30 × 30
T5	40	30 × 30
T6	60	30 × 30
T7	20	45 × 30
T8	40	45 × 30
T9	60	45 × 30

2.2. Experimental Design and Treatment Factors. The experiment was carried out in a two-factorial split-plot design to determine the effect of variable row spacing and phosphorus doses on cowpea yield. The plot size was 4.32 m^2 (2.4 m × 1.8 m). There were three main plot treatments and three subplot treatments, and each was replicated three times for a total of nine plots in each block. Treatments were randomly assigned to the plots and spaced 1 m apart, 0.5 m between treatments within replication.

2.3. Treatment Combination. The experiment was executed with nine treatments combination, involving three doses of phosphorus (named P_1: 20 kg/ha, P_2: 40 kg/ha, and P_3: 60 kg/ha) along with varying spacing (S_1: 15 cm × 30 cm, S_2: 30 cm × 30 cm, and S_3: 45 cm × 30 cm). Treatments were generated combining these different levels of phosphorus and spacing, namely S_1P_1, S_1P_2, S_1P_3, S_2P_1, S_2P_2, S_2P_3, S_3P_1, S_3P_2, and S_3P_3 (Table 1).

2.4. Field Preparation and Layout. The research field was prepared 10 days ahead of sowing by plowing and rotavating the land three times to create fine tilth. The field was then divided into different plots according to the two-factorial split-plot design, with a length of 2.4 m and a breadth of 1.8 m and a distance of 1 m between replicates and 0.5 m between treatments. The soil was leveled with a rake and hoe before planting.

2.5. Plant Material and Agronomic Practices. The variety of cowpea was collected from a local Agro-vet in the periphery of Deukhuri Valley, Dang. Hydro-priming was done by soaking seeds in water overnight and then drying them in the shade for 2 hr to facilitate improved germination rate and plant performance. Well-decomposed FYM, urea (46% N), and MOP (60% K_2O) were applied at the rate of 5 t/ha, 100, and 100 kg/ha, respectively.

Manually sowing of cowpeas was done. The field was lightly irrigated before and after planting and during the thinning and flowering stages. Hand weeding was done at 20 and 45 DAS to control weeds. Potential insects such as hairy caterpillars, pod borers, aphids, grasshoppers, leaf hoppers, and galerucid beetles were identified and managed successfully using botanical pesticides. Gap filling and thinning were performed after 2 weeks of sowing. Finally, the pods were harvested manually three times at 70, 85, and 100 DAS, and the total yield was taken at 100 DAS; collected pod/seed weight was calculated using a weighing balance.

Table 2: Effect of phosphorus and spacing on plant height.

Treatment	Plant height		
	30 DAS	45 DAS	60 DAS
Spacing (cm)			
15 × 30	17.58^a	49.51^a	68.71^a
30 × 30	15.51^b	42.31^a	65.31^a
45 × 30	15.48^b	47.42^a	68.76^a
LSD	—	—	—
CV (%)	11.87	32.7	11.67
F test	NS	NS	NS
Phosphorus (kg/ha)			
20	14.95^b	40.95^a	67.03^a
40	17.09^a	52.84^a	72.51^a
60	16.53^{ab}	45.45^a	63.24^a
LSD	—	—	—
CV (%)	11.085	30.91	21.33
F test	NS	NS	NS
Interaction	NS	NS	NS
Grand mean	16.194	46.41	67.59

Treatments means followed by the same letter(s) within the column are nonsignificantly different among each other at a 5% level of significance. LSD, least significant difference; CV, coefficient of variation; NS, nonsignificant. Source: R Core Team [17].

2.6. Sampling and Collection of Data. Each observation was recorded on five sample plants from each plot, excluding the end rows, to avoid the border effect.

Plant height was measured using a scale from the base of the plant to the tip of the uppermost leaf. The first measurement of plant height and number of branches were taken 30 days after sowing, and subsequent measurements were taken with 2-week intervals up to 60 DAS.

The number of pods from each sampled plant was recorded thrice at regular intervals of 15 days starting from 70 days of sowing. Five pods from each sampled cowpea plant were selected and tagged, and their pod length was measured with a measuring tape at 70, 85, and 100 DAS. Likewise, the pods were harvested and the yield of sampled plants from each plot was measured using a weighing balance three times at 70, 85, and 100 DAS.

3. Statistical Analysis

The collected data were summarized using an Excel package and carefully analyzed to find how spacing and phosphorus levels affected the agronomic traits of cowpeas. Data were subjected to the two-way analysis of variance with interaction effect, mean separation was done via the Duncan multiple range test, and the statistical analysis was performed using R studio v 4.1.1 [17].

4. Results and Discussion

4.1. Plant Height. The effects of phosphorous and spacing on the plant height of cowpeas are shown in Table 2. The spacing between plants and the amount of phosphorus applied did not significantly affect plant height in cowpeas. This

Table 3: Effect of phosphorus and spacing on the number of branches per plant.

Treatment	Number of branches per plant		
	30 DAS	45 DAS	60 DAS
Spacing (cm)			
15 × 30	2.42[a]	3.43[a]	5.60[b]
30 × 30	2.04[b]	3.06[b]	5.57[b]
45 × 30	2.22[b]	3.06[b]	6.60[a]
LSD	0.179	—	—
CV (%)	7.85	9.69	14.72
F test	0.02525*	NS	NS
Phosphorus (kg/ha)			
20	2.0[a]	3.03[a]	5.53[b]
40	2.26[a]	3.094[a]	6.40[a]
60	2.42[a]	3.44[a]	5.84[ab]
LSD	—	—	—
CV (%)	29.2	20.34	12.1
F test	NS	NS	NS
Interaction	NS	NS	NS
Grand mean	2.22	3.19	5.92

Treatments means followed by the same letter(s) within the column are nonsignificantly different among each other at 5% level of significance. LSD, least significant difference; CV, coefficient of variation; NS, nonsignificant. Source: R Core Team [17]. *Significant at the 0.05 level.

Table 4: Effect of phosphorous, spacing, and their interaction on numbers of pods.

Treatment	Numbers of pods		
	70 DAS	85 DAS	100 DAS
Spacing (cm)			
15 × 30	3.84[a]	6.11[a]	8.25[a]
30 × 30	3.82[a]	6.04[a]	7.98[a]
45 × 30	3.46[a]	5.71[a]	7.80[a]
LSD	—	—	—
CV (%)	24.16	9.66	8.23
F test	NS	NS	NS
Phosphorus (kg/ha)			
20	3.55[a]	6.20[a]	7.6[b]
40	3.68[a]	5.71[a]	8.31[a]
60	3.88[a]	5.95[a]	8.13[a]
LSD	—	—	0.475
CV (%)	21.07	16.26	5.77
F test	NS	NS	0.0176*
Interaction	NS	NS	NS
Grand mean	3.71	5.95	8.01

Treatments means followed by the same letter(s) within the column are nonsignificantly different among each other at 5% level of significance. LSD, least significant difference; CV, coefficient of variation; NS, nonsignificant. Source: R Core Team [17]. *Significant at the 0.05 level.

result is in line with Nderi [18], who found that intrarow spacing and distances between plants within a ridge had no significant effect on most vegetative growth attributes of cowpeas. This result is contrary to those of Adigun et al. [19], who said that the least interrow spacing showed slightly taller canopy height.

Similarly, the study carried out by Ayodele and Oso [20], Halder and Panda [21], Kumar et al. [22], and Nkaa et al. [23] also found that a phosphorus application produced significantly taller cowpea plants than the control and attributed this to phosphorus's role in cell division was contrary to our research conducted where no significant difference was reported in any dose of phosphorus applied.

4.2. Number of Branches per Plant. Table 3 shows the spacing between plants had a significant effect on the number of branches per plant in 30 DAS, with the highest number of branches observed at a spacing of 15 cm × 30 cm and the lowest number observed at a spacing of 30 cm × 30 cm. At 45 DAS, all three spacings had a similar number of branches with a nonsignificant difference. This signifies that a higher number of branches can eventually be obtained from the spacing of 15 cm × 30 cm; a similar result was contrary to Ndor et al. [24], who showed that the number of branches per plant decreased as plant density increased with lowering row spacing.

However, the amount of phosphorus applied did not have a significant effect on the number of branches. An experiment by Kumar et al. [22] also showed a nonsignificant difference in the number of branches at all phosphorus levels between 4 and 6 weeks after sowing. However, Aryal et al. [25] found that 40 kg P/ha was optimum for the production of a higher number of branches, and other studies conducted by Augustine and Godfre [12], Magani and Kuchinda [26], and Zia-Ul-Haq et al. [6] have also reported that the total number of branches per plant increased with phosphorus application up to 40 kg P/ha.

4.3. Number of Pods per Plant. The spacing between plants showed no significant effect on the number of pods per plant at any harvest, as revealed in Table 4, which agrees with Boakye Boateng and Wilson [27]. However, the amount of phosphorus applied did have a significant effect on the number of pods per plant at 100 DAS ($p < 0.05$), with the highest number of pods recorded at a phosphorus dose of 40 kg/ha and the lowest number recorded at a phosphorus dose of 20 kg/ha when all three harvests were combined. As shown in Table 4, the overall highest number of pods was observed at the third harvest, followed by the second harvest, and the lowest number was observed at the first harvest. The highest number of pods, i.e., 8.31 was found on the 100 DAS harvest when 40 kg/ha phosphorus was applied. In the same harvest, 20 kg P/ha showed a pod number of 7.6, and 60 kg P/ha showed 8.13 pods per plant. This conclusion is supported by Daramy et al. [28] and Sudharani et al. [29], who also reported that phosphorus had a significant effect on the number of pods.

There was no significant interaction between spacing and phosphorus on the number of pods at any harvest. Increasing the spacing between rows did not significantly affect the number of pods, possibly due to the elasticity of legumes to variations in plant density.

4.4. Pod Length of Cowpea. The study (Table 5) demonstrated that the spacing between plants did not have a significant

Table 5: Effect of phosphorous, spacing, and their interaction on pod length of cowpea.

Treatment	Pod length of cowpea		
	70 DAS	85 DAS	100 DAS
Spacing (cm)			
15 × 30	19.60[a]	19.55[a]	20.44[a]
30 × 30	18.93[ab]	18.68[a]	19.52[a]
45 × 30	17.95[b]	20.24[a]	20.07[a]
LSD	—	—	—
CV (%)	6.46	10.19	7.54
F test	NS	NS	NS
Phosphorus (kg/ha)			
20	18.73[a]	18.60[b]	19.12[b]
40	18.82[a]	19.55[ab]	19.75[ab]
60	18.93[a]	20.33[a]	21.16[a]
LSD	—	1.24	1.46
CV (%)	8.27	6.22	7.13
F test	NS	0.032*	0.03*
Interaction	NS	NS	NS
Grand mean	18.82	19.49	20.01

Treatments means followed by the same letter(s) within the column are nonsignificantly different among each other at 5% level of significance. LSD, least significant difference; CV, coefficient of variation; NS, nonsignificant. Source: R Core Team [17]. *Significant at the 0.05 level.

Table 6: Effect of phosphorus and spacing on fresh pod yield per plot.

Treatment	Fresh pod yield (t/ha)		
	70 DAS	85 DAS	100 DAS
Spacing (cm)			
15 × 30	0.24[a]	0.45[a]	0.40[ab]
30 × 30	0.118[b]	0.37[a]	0.44[a]
45 × 30	0.123[b]	0.36[a]	0.36[b]
LSD	0.063	—	—
CV (%)	37.80	43.50	15.98
F test	0.019*	NS	NS
Phosphorus (kg/ha)			
20	0.08[a]	0.35[a]	0.40[ab]
40	0.21[a]	0.407[a]	0.37[b]
60	0.19[a]	0.43[a]	0.43[a]
LSD	—	—	—
CV (%)	84.21	21.89	15.98
F test	NS	NS	NS
Interaction	0.026*	NS	NS
Grand mean	0.162	0.398	0.405

Treatments means followed by the same letter(s) within the column are nonsignificantly different among each other at 5% level of significance. LSD, least significant difference; CV, coefficient of variation; NS, nonsignificant. Source: R Core Team [17]. *Significant at the 0.05 level.

effect on pod length at any harvest. However, the amount of phosphorus applied did have a significant effect on pod length at 85 and 100 DAS ($p < 0.05$). Pod length was highest with a phosphorus application of 60 kg/ha and lowest with a phosphorus application of 20 kg/ha. At 100 DAS, 60 kg/ha of phosphorus gave 21.16 cm of pod length, while 40 and 20 kg P/ha phosphorus could only give 19.75 and 19.12 cm of pod length, respectively. At 85 DAS, 60 kg/ha of phosphorus treatment gave 20.33 cm of cowpea pod, while 40 and 20 kg P/ha of phosphorus could only give 19.55 and 18.60 cm, respectively. The difference in pod length on 70 DAS was found to be non-significant. Other studies by Augustine and Godfre [12], Suryawanshi et al. [30], and Nkaa et al. [23] have also found that increasing the phosphorus dose increases pod length.

Overall, pod length was highest at 100 DAS, followed by 85 DAS, and lowest at 70 DAS. There appears to be a positive relationship between pod length and the frequency of harvest.

A nonsignificant interaction effect of spacing and phosphorus was observed on the pod length during all harvests, which was also reported by Kwaga [31]. Phosphorus plays an important role in the translocation of assimilates to the pods, being a constituent of protoplasm, which may be responsible for the increased length of pods.

4.5. Yield of Fresh Pod per Plot. Table 6 illustrates that the total yield of fresh pod per plot was not affected significantly by different levels of phosphorus. However, spacing did have some significant effect on the per-plot yield. The spacing did significantly affect ($p < 0.05$) the total yield per plot in 70 DAS. The highest yield per plot (0.24 t/ha) was observed at a spacing of 15 cm × 30 cm, while the lowest yield per plot (0.118 t/ha) was observed at a spacing of 30 cm × 30 cm at 70 DAS. The findings are in line with Hall [4], who found that a smaller plant population with wider spacing can decrease cowpea yield while decreasing spacing between and within rows of dry bean plants significantly increases yield due to the higher plant population. Further, Ankomah et al. [32] also concluded that 15 cm × 30 cm of spacing had an impact on all yield parameters and produced a higher yield. This increase in yield per plot at 15 cm × 30 cm spacing is due to a higher plant population.

The level of phosphorus did not show any significant effect on the yield of the cowpea, which is contrary to Magani and Kuchinda [26], who concluded that a higher amount of phosphorus leads to a higher yield of cowpeas. However, there was a significant interaction between spacing and phosphorus in treatment 2 (S_1P_2) with the highest yield of 0.51 t/ha which is provided in Table 7 and Figure 3. Nikhitha et al. [14] also recorded the significant interaction between the spacing and phosphorus level in the yield of cowpeas.

4.6. Total Yield of Cowpea. The spacing between the plants did not significantly affect the total yield of cowpeas shown in (Table 8). This conclusion was supported by Makinta et al. [33], who also reported that intrarow spacing had no significant effect on most growth attributes of cowpeas.

Here, the application of different doses of phosphorus significantly influenced the total yield ($p < 0.05$). A significantly higher yield per hectare (1.05 t/ha) was recorded with a phosphorus application of 60 kg/ha, which was at par with the yield obtained at 40 kg P/ha (0.99 t/ha), and the lowest

Table 7: Interaction table of fresh pod yield at 70 DAS.

Interaction (spacing × phos)	Yield at 70 DAS (t/ha)
15 × 30 : 20	0.07[b]
15 × 30 : 40	0.51[a]
15 × 30 : 60	0.16[b]
30 × 30 : 20	0.08[b]
30 × 30 : 40	0.10[b]
30 × 30 : 60	0.17[b]
45 × 30 : 20	0.09[b]
45 × 30 : 40	0.04[b]
45 × 30 : 60	0.24[b]

Different superscript letters are used to compare whether these interactions are statistically distinct or not.

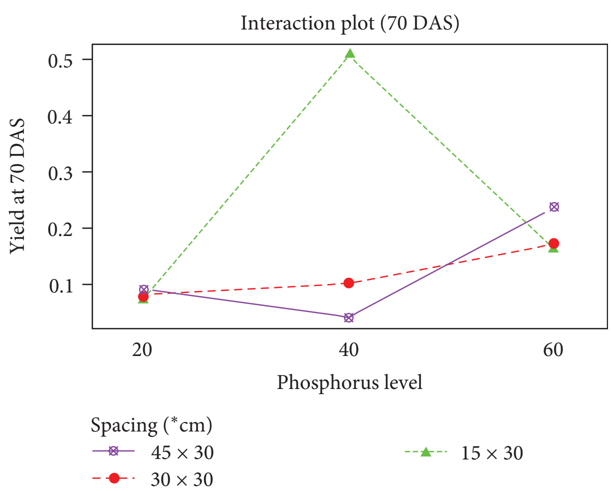

Figure 3: Interaction of phosphorus level and spacing in fresh pod yield at 70 DAS (t/ha).

Table 8: Effect of phosphorus and spacing on total yield of cowpea.

Treatment	Yield (t/ha)
Spacing (cm)	
15 × 30	1.10[a]
30 × 30	0.93[a]
45 × 30	0.85[a]
LSD	—
CV (%)	38.71
F test	NS
Phosphorus (kg/ha)	
20	0.84[b]
40	0.99[a]
60	1.05[a]
LSD	0.14
CV (%)	14.26
F test	0.019*
Interaction	0.004**
Grand mean	0.96

Treatments means followed by the same letter(s) within the column are nonsignificantly different among each other at 5% level of significance. LSD, least significant difference; CV, coefficient of variation; NS, nonsignificant. Source: R Core Team [17]. *Significant at the 0.05 level, **Significant at the 0.01 level.

Table 9: Interaction table for total yield of cowpea (t/ha).

Interaction (spacing × phos)	Total yield (t/ha)
15 × 30 : 20	0.82[cd]
15 × 30 : 40	1.41[a]
15 × 30 : 60	1.08[b]
30 × 30 : 20	0.88[bcd]
30 × 30 : 40	0.86[bcd]
30 × 30 : 60	1.08[b]
45 × 30 : 20	0.83[bcd]
45 × 30 : 40	0.72[d]
45 × 30 : 60	1.02[bc]

Different superscript letters are used to compare whether these interactions are statistically distinct or not.

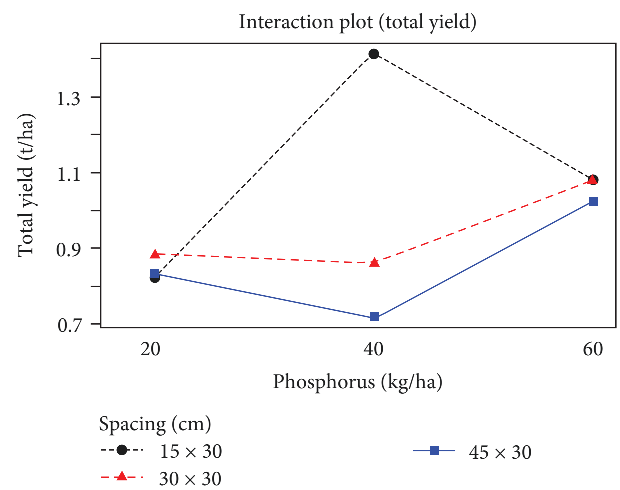

Figure 4: Interaction of phosphorus level and spacing in total yield of cowpea (t/ha).

yield (0.84 t/ha) was recorded at 20 kg/ha of phosphorus application. Singh et al. [34] found that phosphorus fertilizer, specifically 60 kg P/ha, enhanced total fresh pod yield. Nyoki and Ndakidemi [35] also found that phosphorus application increased pod yield per plant, with the highest yield at 40 kg/ha, also reported by Nkaa et al. [23] and 80 kg/ha. Other studies, including Ndor et al. [24], Ankomah et al. [32], and Magani and Kuchinda [26], also found that phosphorus fertilizers significantly increased yield per plant compared to the control treatment. According to Aryal et al. [25], phosphorus is responsible for higher photosynthetic efficiency that leads to better formation of seed and grain filling, thus giving higher yield.

Grain yield was also significantly affected by the interactive effect of spacing × phosphorus placement at a probability level of 1% ($p < 0.01$), as shown in Table 9 and Figure 4. In the interaction effect, the highest grain yield of 1.41 t/ha belongs to $T_2(S_1P_2)$, followed by a yield of 1.08 t/ha at $T_3(S_1P_3)$ and $T_6(S_2P_3)$. Other treatments, $T_4(S_2P_1)$, $T_5(S_2P_2)$, and $T_7(S_3P_1)$, were statistically at par with treatments 3 and 6. The increase in yield might be due to root proliferation leading to nitrogen fixation for better crop establishment and production. A similar result has been reported by Nikhitha et al. [14] in cowpea and Abraham et al. [36] in black gram.

5. Conclusion

In conclusion, the level of phosphorus and spacing is the measure to increase the production of cowpeas, and the variety (Malepatan-1) performed quite well under different phosphorus levels. Based on the research findings, it can be concluded that 40 kg/ha phosphorus and 15 cm × 30 cm spacing have better yield performance. Since the findings are based on one season, further research is needed to confirm the result and make specific recommendations on spacing and phosphorus levels for cowpeas under different seasons and geographical locations.

Data Availability

Data will be available upon request.

Conflicts of Interest

The authors report no conflicts of interest. The author alone is responsible for the content and writing of this article.

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