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Effect of nitrogen management and phosphorus levels on growth, yield attributes and yield of summer fodder pearl millet (*Pennisetum glaucum* L.) varieties

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Abstract
A field experiment, "Effect of nitrogen management and phosphorus levels on summer fodder pearl millet (*Pennisetum glaucum* L.) Varieties under North Gujarat agro-climatic conditions" was conducted at Agronomy Instructional Farm, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar during summer season of 2020. The soil of the experimental field was loamy sand in texture. There were twelve treatment combinations consisting two varieties i.e., V_1 (GFB 1) and V_2 (GFB 4), three levels of nitrogen management i.e., N_1 (60 kg N/ha as a basal + 30 kg N/ha after first cut), N_2 (60 kg N/ha as a basal + 45 kg N/ha after first cut) and N_3 (60 kg N/ha as a basal + 60 kg N/ha after first cut) and two levels of phosphorus i.e., P_1 (40 kg P_2O_5/ha) and P_2 (60 kg P_2O_5/ha) were tested in randomized block design with factorial concept. The results revealed that an application of N_3 (60 kg/ha as a basal + 60 kg/ha after first cut) recorded significantly higher plant height, number of leaves per plant, leaf length, leaf width, leaf: Stem ratio, stem girth, green fodder yield and dry fodder yield of summer fodder pearl millet variety (GFB 4). An application of 60 kg P_2O_5/ha recorded significantly higher plant height, number of leaves per plant, leaf length, leaf width, leaf: stem ratio, stem girth, green fodder yield and dry fodder yield of summer fodder pearl millet variety (GFB 4) over other treatments.

Keywords: Nitrogen management, phosphorus levels, yield attributes

Introduction

The fodder pearl millet (*Pennisetum glaucum* L.) is commonly known as Rajka *Bajri* or *Chari Bajra*, belongs to family Poaceae (Gramineae) and is an important summer season fodder crop, which is widely grown to meet the grain, green fodder as well as dry fodder requirement of the livestock in areas where, rainfall is low, temperature is high, prolonged dry period and lower soil fertility. The nutritive value of fodder pearl millet is fairly high and it is fairly rich in fat content and the highest minerals (2.7%) as compared to other cereals. Pearl millet (*Pennisetum glaucum* L.) is the fourth most important cereal staple food crop in India next to rice, wheat and sorghum. It is the most widely cultivated millet crop, occupying a prominent position in global agriculture. Pearl millet area in India nearly 7.4 million hectares, production 9.13 million tonnes and yield is 1237 kg/ha in 2017-18. Nitrogen and phosphorus are major elements which increase the crop production. Among all the primary nutrients, nitrogen plays a pivotal role in quantitative as well as qualitative improvement in the productivity of the crop. Nitrogen is an important constituent of protein and chlorophyll (Khinchi *et al.*, 2017) [24].

Phosphorus is the second most important plant nutrient for the production of crops. Phosphorus has been called the "bottleneck of global hunger" (Gautam *et al.*, 2019) [17]. Phosphorus plays an important role in plant growth and development. It is a component of nucleic acids and plays a vital role in cell respiration and metabolism. Phosphorus plays a role in many enzyme reactions, sugar metabolism and energy storage and transport. Phosphorus is component of cell membranes, chloroplast and mitochondria. The important of phosphorus as yield limiting factor in many soils is well established. Phosphorus plays an important role in the production of seed and fruit, the growth of roots, and the maturing of crops. It helps the fruit ripen faster, reducing the effects of too much nitrogen in the soil.

Phosphorus strengthens the plant's skeletal structure, reducing the risk of lodging. (Meseret 2018) [49].

Material and Methods

The experiment was conducted at Agronomy Instructional Farm, Chimanbhai Patel College of Agriculture, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar during summer, 2020.

The details of the experimental technique employed for the investigation on "Effect on nitrogen management and phosphorus levels on growth, yield attributes and yield of summer fodder pearl millet (*Pennisetum glaucum* L.) varieties" had total 12 treatments *viz*., T_1: GFB 1 + 60 kg N/ha as a basal + 30 kg N/ha after first cut + 40 kg P_2O_5/ha, T_2: GFB 1 + 60 kg N/ha as a basal + 30 kg N/ha after first cut + 60 kg P_2O_5/ha, T_3: GFB 1 + 60 kg N/ha as a basal + 45 kg N/ha after first cut + 40 kg P_2O_5/ha, T_4: GFB 1 + 60 kg N/ha as a basal + 45 kg N/ha after first cut + 60 kg P_2O_5/ha, T_5: GFB 1 + 60 kg N/ha as a basal + 60 kg N/ha after first cut + 40 kg P_2O_5/ha, T_6: GFB 1 + 60 kg N/ha as a basal + 60 kg N/ha after first cut + 60 kg P_2O_5/ha, T_7: GFB 4 + 60 kg N/ha as a basal + 30 kg N/ha after first cut + 40 kg P_2O_5/ha, T_8: GFB 4 + 60 kg N/ha as a basal + 30 kg N/ha after first cut + 60 kg P_2O_5/ha, T_9: GFB 4 + 60 kg N/ha as a basal + 45 kg N/ha after first cut + 40 kg P_2O_5/ha, T_{10}: GFB 4 + 60 kg N/ha as a basal + 45 kg N/ha after first cut + 60 kg P_2O_5/ha, T_{11}: GFB 4 + 60 kg N/ha as a basal + 60 kg N/ha after first cut + 40 kg P_2O_5/ha and T_{12}: GFB 4 + 60 kg N/ha as a basal + 60 kg N/ha after first cut + 60 kg P_2O_5/ha were tried in factorial randomized block design with three replications. The soil of experimental field was loamy sand in texture, slightly alkaline in nature with low in organic matter and medium in available nitrogen and available phosphorus and potassium.

Results and Discussion

Effect of varieties

The data presented in Table 1 result indicated that plant height during two cut (1st cut and 2nd cut) was significantly influenced due to varieties. Significantly higher plant height (181.78 cm and 166.40 cm, respectively) during 1st cut and 2nd cut was recorded under variety GFB 4 as compared to variety GFB 1.

The variation in plant height in different fodder pearl millet varieties may be due to disparity in genetic make-up of these varieties. Significant difference in pearl millet varieties in respect of plant height have also been reported by Chohan *et al.* (2006) [9] and Amodu *et al.* (2007) [1]. Ayub *et al*. (2012) [4] also perceived significant dissimilarities among different varieties regarding plant height. Numbers of leaves per plant significantly influence by the varieties during 1st cut and 2nd cut. Significantly higher number of leaves per plant (9.9 and 8.4) was recorded under the variety GFB 4 as compared to variety GFB 1 during 1st cut and 2nd cut, respectively. The difference in leaves per plant may be caused by the internodal length of the plants or the plant height. These results endorsed the findings of Faridullah *et al*. (2010) [16], who also indicated that varieties differ significantly for number of leaves per plant. In the same way these results are in line to the findings of Mitra *et al*. (2001) [28], who noted. The greatest response to selective selection in leaf number per plant when observing genetic elements of variability in a pear millet population with respect to fodder yield. While genetic variation for number of leaves was previously reported by Khan *et al.* (2004) [18].

The leaf length was significantly influenced due to different varieties during 1st cut and 2nd cut. Significantly higher leaf length (63.83 cm and 60.08 cm) was recorded under the variety GFB4 as compared to variety GFB1 during 1st cut and 2nd cut, respectively. This might be due to difference in genetic constitution among the varieties. These results were in conformity with the findings of Mishra *et al*. (2017) [27], Srivastava *et al*. (2009) [44] and Satpal *et al*. (2015) [36].

The results given in the Table 1 revealed that leaf: Stem ratio was significantly influenced due to the varieties. Significantly higher leaf: Stem ratio (0.51 and 0.47) was recorded under the variety GFB-4 as compared to GFB-1 at 1st cut and 2nd cut, respectively. This might be due to the genetic variation among the varieties. The GFB 4 variety has profuse growth with more number of leaves and leaf length which might have contributed to higher leaf: stem ratio. These results are in line with the earlier findings as reported by Satpal *et al*. (2015) [36] and Shinde *et al*. (2015) [39].

The result depicted in Table 1 with regard to stem girth indicated that a difference in results due to varieties was fond significant. Significantly higher stem girth (28.02 and 27.71 mm) was recorded under the verity GFB 4 as compared to variety GFB 1 during 1st cut and 2nd cut, respectively. This variation in stem diameter may be due to difference in heredities of the varieties. These results conducted with the results of Yusuf *et al*. (2011) [47] and Khan *et al.* (2004) [18] who found significant difference in pearl millet varieties regarding stem diameter. Ayub *et al.* (1999) [6] also found the stem diameter of various sorghum cultivars cultivated for forage objectives exhibits variability.

The data exhibited in Table 2 showed that the green fodder yield was significantly influenced due to different varieties. Significantly higher green fodder yield (322, 243 and 565 q/ha) was observed under the variety GFB 4 as compared to variety GFB 1, in the 1st cut and 2nd cut as well as total of two cuts, respectively. This was due to the genotype's superiority lies in its ability to generate a greater number of growth characteristics, such as plant height, the number of leaves per plant, and leaf length. Similar results were also reported by Singh *et al.* (2012) [40] and Damame *et al*. (2014) [12].

The data exhibited in Table 2 showed that the dry fodder yield was significantly influenced due to different varieties. Significantly higher dry fodder yield (79, 58 and 137 q/ha) was observed under the variety GFB 4 as compared to variety GFB 1, during 1st cut and 2nd cut as well as total of two cuts, respectively. It might be due to genetic potential of those particular varieties and contributing factors of dry matter production. Faridullah *et al*. (2010) [16] also reported significant difference among pearl millet varieties regarding dry matter yield. The results are also agreement of Damame *et al*. (2014) [12].

Effect of nitrogen management

Data outlined in Table 1 indicated that the plant height during 2nd cut was significantly influenced due to nitrogen management. Significantly higher plant height (168.79 cm) was recorded in 2nd cut with treatment N_3 (60 kg N/ha as a basal + 60 kg N/ha after first cut) as compared to treatment N_1 (60 kg N/ha as a basal + 30 kg N/ha after first cut) and N_2 (60 kg N/ha as a basal + 45 kg N/ha after first cut). Significantly the highest plant height was recorded by application of nitrogen dose N_3 during 2nd cut may be due tothe impact of nitrogen fertilization on promoting the growth of fodder pearl millet and the enhancements in the length and quantity of internodes. Similar trend was reported by Ayub *et al*. (2009) [3], El-Sarag and Abu Hashem (2009) [14] and Pathan *et al*. (2010) [32].

The data in Table 1 further indicated that number of leaves per plant was significantly influenced due to nitrogen management treatments during 2nd cut. Among different nitrogen management treatments, treatment N_3 (60 kg N/ha as a basal + 60 kg N/ha after first cut) recorded significantly higher numbers of leaves per plant (8.3) as compared to treatment N_1 (60 kg N/ha as a basal + 30 kg N/ha after first cut), but it remain at par with treatment N_2 (60 kg N/ha as a basal + 45 kg N/ha after first cut) during 2nd cut. Nitrogen play essential role in plant life *viz.*, the significant increase in the number of leaves per plant may be attributed to its function in rapidly multiplying tissues and increasing the amount of growth substances, such as naturally occurring phytohormones. Additionally, the photosynthesis rate and level of auxin supply are elevated with a higher level of nitrogen, further contributing to this increase in plant. The results are also agreement of Khinchi *et al*. (2017) [24]. A similar result was recorded by Chaudhary *et al*. (2020) [8].

The results depicted in Table 1 with regard to leaf length indicated that a difference in results due to different treatments of nitrogen management was found significant during the 2nd cut. Treatment N_3 (60 kg N/ha as a basal + 60 kg N/ha after first cut) recorded significantly higher leaf length (61.26 cm) during the 2nd cut as compared to the treatment N_1 (60 kg N/ha as a basal + 30 kg N/ha after first cut), but it was at par with the treatment N_2 (60 kg N/ha as a basal + 45 kg N/ha after first cut). The result showed that there was a gradual increase in leaf length with the increase in level of nitrogen due to the acceleration of cell division, along with enhanced cell expansion, led to a simultaneous increase in photosynthate formation, ultimately resulting in an elevated leaf length. The results are also agreement of Patel *et al.* (2014) [31].

The data in Table 1 further indicated that leaf width was significantly influenced due to nitrogen management treatments during 2nd cut. Among different nitrogen management treatments, treatment N_3 (60 kg N/ha as a basal + 60 kg N/ha after first cut) recorded significantly higher leaf width (1.75 cm) as compared to treatment N_1 (60 kg N/ha as a basal + 30 kg N/ha after first cut), but it remain at par with treatment N_2 (60 kg N/ha as a basal + 45 kg N/ha after first cut) during 2nd cut. The results are also agreement of Jung *et al*. (2016) [20] and Hussaini *et al*. (2020) [19].

The data presented in Table 1 indicated that the effect of nitrogen management on leaf: Stem ratio was found significant at 2nd cut. Significantly highest leaf: Stem ratio (0.48) was observed under the treatment N_3 (60 kg N/ha as a basal + 60 kg N/ha after first cut) as compared to treatment N_1 (60 kg N/ha as a basal + 30 kg N/ha after first cut) but, it remain at par with the treatment N_2 (60 kg N/ha as a basal + 45 kg N/ha after first cut) during 2nd cut. The application of nitrogen may have ultimately led to an increase in the leafy portion, resulting in enhanced photosynthetic activities and the production of a greater amount of photosynthates. This readily supplied food growing parts might have helped in improvement of leaf: stem ratio. The results are also agreement of Raval *et al*. (2015) [34]. Similar results were recorded by Tahira Begum *et al*. (2018) [45] and Vyas *et al*. (2015) [34].

An appraisal of data presented in Table 2 illustrated that different treatments of nitrogen management have significant effect on stem girth during 2nd cut. Significantly higher stem girth (30.47 mm) was recorded with application of the treatment of N_3 (60 kg N/ha as a basal + 60 kg N/ha after first cut) as compared to the treatment N_1 (60 kg N/ha as a basal + 30 kg N/ha after first cut) but, it remains at par with the treatment N_2 (60 kg N/ha as a basal + 45 kg N/ha after first cut).The stem circumference progressively expanded throughout the various stages of crop growth. This could be attributed to the sufficient provision of nutrients and favorable conditions during this period. The results are also agreement of Arshewar *et al*. (2018) [2].

An appraisal of data presented in Table 2 illustrated that different treatments of nitrogen management have significantly effect on the green fodder yield. Significantly higher green fodder yield (253 and 580 q/ha) was recorded under the treatment N_3 (60 kg N/ha as a basal + 60 kg N/ha after first cut) as compared to treatment N_1 (60 kg N/ha as a basal + 30 kg N/ha after first cut) and N_2 (60 kg N/ha as a basal + 45 kg N/ha after first cut) in the 2ndcut as well as total yield of 1st cut and 2nd cut, respectively. This may be mainly because the nitrogen improved growth parameters *viz.*, plant height, number of leaves per plant, leaf length and leaf: Stem ratio. Nitrogen plays a direct role in cell division, elongation, the formation of nucleotides, and co-enzymes. These processes contribute to increased meristematic activity. Additionally, nitrogen is an essential component of chlorophyll, which is crucial for the photosynthetic activity of leaves. Ultimately, this aids in the accumulation of a greater biomass. These results are in conformity with the findings of Dudhat *et al.* (2004) [13], Sharma and Verma (2005) [37], Sheoron and Rana (2006) [48], Chotiya and Singh (2005) [10], Singh *et al*. (2013) [42], Chouhan *et al.* (2015) [11], Khinchi *et al*. (2017) [24] and Kadam *et al*. (2019) [21].

An appraisal of data presented in Table 2 illustrated that different treatments of nitrogen management have significantly effect on the dry fodder yield. Significantly higher dry fodder yield (60 and 139 q/ha) was recorded under the treatment N_3 (60 kg N/ha as a basal + 60 kg N/ha after first cut) as compared to treatment N_1 (60 kg N/ha as a basal + 30 kg N/ha after first cut) and N_2 (60 kg N/ha as a basal + 45 kg N/ha after first cut) during 2nd cut as well as total yield of 1st cut and 2nd cut, respectively. Further, the advantageous impacts of nitrogen on the process of cell division and elongation, as well as the creation of nucleotides and co-enzymes, have led to a boost in meristematic activity and the expansion of the photosynthetic area. Consequently, this has resulted in a higher production and accumulation of photosynthates, ultimately yielding dry fodder. The results are also agreement of Khinchi *et al*. (2017) [24], Vyas *et al*. (2015) [34], Bramhaiah *et al*. (2018) [7] and Sheoran *et al*. (2016) [38].

Effect of phosphorus

Data outlined in Table 1 indicated that the plant height during 1st cut and 2nd cut significantly influenced with application of increasing levels of phosphorus. Significantly higher plant height (181.92 cm and 165.87 cm) was recorded during 1st cut and 2nd cut, respectively under the treatment P_2 (60 kg/ha) as compared to treatment P_1 (40 kg/ha). Promotion effect of high P level on plant height was probably due to better development of root system and nutrient absorption. The results are also agreement with Gautum *et al*. (2019) [17], Hussain *et al*. (2004) [18] and Singh *et al*. (2019) [17].

Data outlined in Table 1 indicated that the number of leaves per plant was significantly influenced with application of increasing levels of phosphorus. Application of 60 kg P_2O_5/ha recorded significantly higher number of leaves per plant (9.9 and 8.3) during 1st cut and 2nd cut, respectively as compared to application 40 kg P_2O_5/ha. Significantly highest number of leaves per plant by the application of 60 kg P_2O_5/ha was due to efficient utilization of nutrients through extensive root system developed by virtue of rapid cell division, cell elongation in meristematic region of the plant which have increased growth behavior, which reflect on number of leaves per plant. The results are also conformity with Eltelib *et al.* (2006) [15] and Muhmmad *et al.* (2019) [30].

The result presented in Table 1 revealed that the leaf length was significantly influenced due to phosphorus levels. Application of 60 kg P_2O_5/ha recorded significantly higher leaf length (63.60 cm and 60.00 cm) as compared to 40 kg P_2O_5/ha during 1st cut and 2nd cut, respectively. This may be due to the presence of phosphorus has a beneficial impact on cellular metabolism, leading to an increase in photosynthetic activity as a result of greater energy availability. The results are also agreement of Roy *et al.* (2010) [35].

The results given in Table 1 revealed that leaf: Stem ratio was significantly influenced due to phosphorus levels. Application of 60 P_2O_5 kg/ha recorded significantly higher leaf: Stem ratio (0.50 and 0.46) as compared to 40 P_2O_5 kg /ha at 1st cut and 2nd cut, respectively. Higher leaf: stem ratio was observed with the application of 60 kg P_2O_5/ha may be due to phosphorus, an essential element in photosynthesis, boosts the efficiency of leaf photosynthesis. Consequently, it increases the availability of photosynthates, leading to improvements in plant height, leaf area, and ultimately, the production of dry matter. This, in turn, results in an increased leaf: Stem ratio. The results are also agreement of Rashid *et al.* (2012) [33]. Similar results are recorded by Monika *et al.* (2018) [29].

Data outlined in Table 1 indicated that the stem girth was significantly influenced with application of increasing levels of phosphorus. Application of 60 kg P_2O_5/ha recorded significantly higher stem girth (30.64 and 29.76 mm) as compared to 40 kg P_2O_5/ha during 1st cut and 2nd cut, respectively. The results are also agreement of Singh *et al.* (2014) [41].

The data furnished in Table 2 revealed that green fodder yield was significantly influenced due to phosphorus levels. The application of 60 P_2O_5 kg/ha recorded significantly higher green fodder yield (322, 243 and 565 q/ha) as compared to 40 P_2O_5 kg/ha during 1st cut and 2nd cut as well as total yield of 1st cut and 2nd cut, respectively. The increase in yield was mainly due to greater plant height, number of leaves per plant, leaf length, leaf: Stem ratio and stem diameter. The present findings were in conformity with those of Ayub *et al.* (2002) [5], Mahmud *et al.* (2003) [25] and Khan *et al.* (2014) [23].

The data furnished in Table 2 revealed that dry fodder yield was significantly influenced due to phosphorus levels. The application of 60 P_2O_5 kg/ha recorded significantly higher dry fodder yield (79, 57 and 136 q/ha) as compared to 40 P_2O_5 kg/ha during 1st cut and 2nd cut as well as total yield of 1st cut and 2nd cut, respectively. Phosphorus plays a crucial role in altering the soil and plant surroundings, which ultimately promotes enhanced growth. The pattern observed in the dry matter composition closely resembled that of the yield of green fodder. Similar results were recorded by Khan *et al.* (2014) [23] and Singh *et al.* (2019) [17].

Table 1: Growth parameters of summer fodder pearl millet as influenced by varieties, nitrogen management and phosphorus levels

Treatments	Plant height (cm)		Number of leaves per plant		Leaf length (cm)		Leaf width (cm)		Leaf : stem ratio		Stem girth (mm)	
	1st cut	2nd cut	1st cut	2nd cut	1st cut	2nd cut	1st cut	2nd cut	1st cut	2nd cut	1st cut	2nd cut
Varieties (V)												
V_1	169.88	155.08	9.2	7.6	58.29	55.76	1.72	1.63	0.46	0.41	30.47	29.63
V_2	181.78	166.40	9.9	8.4	63.83	60.08	1.79	1.70	0.50	0.47	28.02	27.71
S.Em. ±	3.27	2.83	0.17	0.13	1.41	1.04	0.03	0.03	0.01	0.01	0.68	0.50
C.D. (P = 0.05)	9.60	8.30	0.5	0.4	4.13	3.06	NS	NS	0.04	0.03	1.99	1.47
Nitrogen management (N)												
N_1	170.54	152.14	9.3	7.6	58.30	54.55	1.71	1.57	0.45	0.41	27.57	27.05
N_2	175.87	161.30	9.4	8.1	61.17	57.96	1.73	1.67	0.47	0.44	29.70	28.92
N_3	181.08	168.79	10.0	8.3	63.69	61.26	1.82	1.75	0.50	0.48	30.47	30.04
S.Em.±	4.01	3.47	0.21	0.16	1.72	1.28	0.03	0.04	0.01	0.01	0.83	0.61
C.D. (P = 0.05)	NS	10.17	NS	0.5	NS	3.74	NS	0.12	NS	0.04	NS	1.80
Phosphorus levels (P_2O_5)												
P_1	169.74	155.61	9.3	7.7	58.51	55.84	1.72	1.62	0.45	0.42	27.85	27.58
P_2	181.92	165.87	9.9	8.3	63.60	60.00	1.79	1.71	0.50	0.46	30.64	29.76
S.Em.±	3.27	2.83	0.17	0.13	1.41	1.04	0.03	0.03	0.01	0.01	0.68	0.50
C.D. (P = 0.05)	9.60	8.30	0.5	0.4	4.13	3.06	NS	NS	0.04	0.03	1.99	1.47
Interactions												
V × N	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
V × P	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
N × P	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
V × N × P	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
C.V. (%)	7.90	7.47	7.67	6.97	9.78	7.64	6.51	8.17	10.65	9.98	9.85	7.40

Table 2: Fodder yield of summer fodder pearl millet as influenced by varieties, nitrogen management and phosphorus levels

Treatments	Green fodder yield (q/ha)			Dry fodder yield (q/ha)		
	1st cut	2nd cut	Total	1st cut	2nd cut	Total
Varieties (V)						
V_1	297	223	520	72	53	125
V_2	322	243	565	79	58	137
S.Em. ±	8	5	11	2	1	3
C.D. (P=0.05)	23	15	31	6	4	8
Nitrogen Management (N)						
N_1	294	212	506	72	50	122
N_2	307	233	540	75	55	130
N_3	327	253	580	79	60	139

S.Em.±	10	6	13	2	2	3
C.D. (P=0.05)	NS	18	38	NS	5	9
Phosphorus Levels (P_2O_5)						
P_1	296	222	518	72	53	125
P_2	322	243	565	79	57	136
S.Em.±	8	5	11	2	1	3
C.D. (P=0.05)	23	15	31	6	4	8
Interactions						
V × N	NS	NS	NS	NS	NS	NS
V × P	NS	NS	NS	NS	NS	NS
N × P	NS	NS	NS	NS	NS	NS
V × N × P	NS	NS	NS	NS	NS	NS
C.V. (%)	10.67	9.32	8.32	11.22	9.86	8.75

Conclusion

From the forgoing results, it is concluded that the summer fodder pearl millet variety GFB 4 should be fertilized with 60 kg N/ha and 60 kg P_2O_5/ha as a basal and 60 kg N/ha after first cut for getting higher green and dry fodder yields and net monetary realization in loamy sand under North Gujarat agro-climatic conditions.

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