EFFECT OF PEARL MILLET (*Pennisetum glaucum* L.)- PULSES INTERCROPPING SYSTEM WITH NUTRIENT MANAGEMENT ON GROWTH AND YIELD OF PEARL MILLET

ABSTRACT

A field experiment was conducted at the College Farm, N. M. College of Agriculture, Navsari Agricultural University, Navsari (Gujarat) to study the effect of pearl millet (*Pennisetum glaucum* L.) - pulses intercropping system and nutrient management on growth and yield of pearl millet during summer season of the years 2021 and 2022. The experiment was laid out in a split plot design consisting 24 treatment combinations replicated thrice. The main plot treatments comprised of four intercropping system *viz*., sole pearl millet (I_1), pearl millet + greengram (I_2), pearl millet + blackgram (I_3), pearl millet + cowpea (I_4) and six nutrient management practices in sub plot *viz*. control (F_1), 100% RDF to pearl millet through inorganic fertilizer (F_2), 5 t/ha FYM + 100% RDF through inorganic fertilizer (F_3), 5 t/ha FYM + 100% RDF through inorganic fertilizer on base of STV (F_4), 25% RDN through FYM + 75% RDF through inorganic fertilizer (F_5) and 50% RDN through FYM + 50% RDF through inorganic fertilizer (F_6). Among main plot effect, significantly higher dry matter accumulation per plant, number of effective tillers per plant, earhead length, earhead weight, grain weight per earhead, grain and straw yields of pearl millet were noted in sole pearl millet (I_1) during both the years of investigation as well as in pooled analysis. Whereas plant height and pearl millet equivalent yield was significantly higher in pearl millet + greengram (I_2) intercropping system. In case of sub plot nutrient management practices, significantly higher values of plant height, dry matter accumulation per plant, number of effective tillers per plant, earhead length, earhead weight, grain weight per earhead, grain and straw yields as well as pearl millet equivalent yield were recorded in F_4 (5 t/ha FYM + RDF through inorganic fertilizer on base of STV) which remained statistically at par with treatment F_3 (5 t/ha FYM + 100% RDF through inorganic fertilizer) treatment. Interaction effect of I_1F_4 (sole pearl millet along with 5 t/ha FYM + RDF through inorganic fertilizer on base of STV) resulted in significantly higher dry matter accumulation per plant at 60 DAS and harvest, earhead weight, grain weight per earhead, grain and straw yield of pearl millet.

Keywords: Intercropping system, Nutrient management, Pearl millet, Pulses, Growth, Yield

INTRODUCTION

Indian economy is one of the fastest growing economies and is predominantly agrarian based. As our country races towards becoming one of the largest economies in the world it must ensure that agriculture its primary sector, should achieves its full-fledged

growth. “In India, rainfed agro-ecosystem the so-called grey patches untouched by green revolution occupies a very important position in the Indian agriculture. Approximately 56% of the total cultivated area in India falls under rainfed agriculture. The importance of the rainfed agriculture can be gauged from the fact that it contributes to 40% of the country’s food production; accounts for much of the national area under coarse cereals (85%), pulses (83%), oilseeds (70%) and cotton (65%) as well as supports 60% of the total livestock populations” (Venkateswarlu and Prasad 2012). Therefore, the developmental needs of the rainfed regions would be of foremost importance in future too.

“Pearl millet (*Pennisetum glaucum* L.) is commonly known as Bajra, Indian millet and Cattail millet in India. It is the fourth most important food grain crop after rice, wheat, sorghum and among the millets, it comes next to sorghum in area and production. Besides being a staple diet of about 10% population of our country it is an important fodder crop also. The nutritive value of pearl millet is high and have higher amount of fat content as compared to other cereals and imparts substantial energy to the body with good digestibility” (Sharma and Burark, 2015). It is one of the most important rainfed crops, being inherent drought-escaping mechanism and adaption to drier and low fertile conditions, it occupies a prime place in dryland agriculture and contributing significantly to country’s food security. But typically pearl millet cultivated as a mono crop in arid and semi-arid region of the state that increased chance of low production as well as limited availability of land resources and declining soil fertility has raised concerns about ability of agriculture to sustain the increasing demand of the population. To counter the demand, we have to look for ways which enhance the use of currently available resources than in the past.

“Intercropping is one promising practice which is effective to augment the total productivity per unit area of the land per unit time by growing more than one crop in the same field with an objective of better utilization of environmental resources. The basic concept of intercropping involves growing together two or more crops with the assumption that two crops can exploit the environment better than one and ultimately produce higher yield” (Reddy and Willy, 1981). “Cereal-pulses intercropping has attracted the attention of agronomists, possibly as a result of the established and theoretical advantages of intercropping systems. Intercropping with pulses is a practice in which N fixed by latter enhances the qualitative and quantitative traits of the former to finally reach food security and sustainability. Pulses such as greengram, blackgram and cowpea are known to fix the atmospheric nitrogen with the help of rhizobium bacteria and it supplies the cereal crop with the required nitrogen. Nutrient management is one of the important cost effective factors

known to augment the crop production. Hence, inclusion of pulses in any intercropping system has becomes imperative with the overall view of maintaining soil fertility and for economizing fertilizer use" (Reddy and Willy, 1981). Keeping the foregoing circumstances in mind present study is conducted to evaluate the effect of intercropping pulses *i.e*., greengram, blackgram and cowpea with pearl millet and different nutrient management practices on the growth and yield of the pearl millet.

MATERIALS AND MATHOD

The field experiment was carried out during summer season of both the years 2021 and 2022on plot E-18 at College Farm, N. M. College of Agriculture, Navsari Agricultural University, Navsari (Gujarat).Before commencement of experiment pre-planting, composite soil samples were collected from the experimental site at 0-15 cm depth and the composite sample was prepared and analyzed for physical and chemical characteristics. The soil texture of the experimental site was clayey in nature having 13.09% sand, 24.58% silt and 62.33% clay with medium depth (50 cm). The soil was slightly alkaline in nature with pH 8.10 and electrical conductivity of 0.42 dS/m. The initial nutrient status in soil was determined by using the standard procedure and result indicated that the experimental site was low in organic carbon (0.39%) and available nitrogen (196.23 kg/ha) while medium in available phosphorus (38.85 kg/ha) and high in potassium (290.20 kg/ha).

The experimental treatments were consisted of two factors in split plot design. Main plot had four treatments of intercropping system *viz*., sole pearl millet (I_1), pearl millet + greengram (I_2), pearl millet + blackgram (I_3) and pearl millet + cowpea (I_4). While sub plot was consisting of six nutrient management practices *viz*., Control (F_1), 100% RDF to pearl millet through inorganic fertilizer (F_2), 5 t/ha FYM + 100% RDF through inorganic fertilizer (F_3), 5 t/ha FYM + 100% RDF through inorganic fertilizer on base of STV (F_4), 25% RDN through FYM + 75% RDF through inorganic fertilizer (F_5) and 50% RDN through FYM + 50% RDF through inorganic fertilizer (F_6) with three replications. The pearlmillet variety GHB 1231, greengram variety GM 6, cowpea variety GC 6 and blackgram variety GU 3 were used as a test varieties. Pearl millet was sown in paired rows at 30 cm keeping 60 cm distance between 2 pairs to adjust 1 row of intercrop. Fertilizer application was done as per treatment to only pearl millet crops (RDF is 80:40:00 kg NPK/ha) and RDF to pulses crop base on area (RDF is 20:40:00 kg NPK/ha).

Five plants were randomly selected from each net plot area at 30, 60 DAS and at harvest and the following observations were recorded. Plant population was recorded per net plot, Plant height (cm) was recorded from the base to the tip of the main shoot at 30, 60 DAS

and at harvest. For dry matter accumulation (g/plant) five randomly selected plants were pulled out from each gross plot. The plants were washed out with water to remove soil adhered to roots. Plants were allowed to sun dry first and finally oven-dried at 65°C for 24 hours up to dry and constant weight and recorded accordingly. An emerging number of effective tillers that could bear earhead were monitored and recorded. Length of earhead and girth of earhead (cm) was measured from the selected earhead from each net plot. Test weight (g) of 1000 grains from the bulk sample for each treatment was worked out. Grain and straw yield of each net plot was measured and converted into kg per hectare. The harvest index was calculated by dividing the economic yield by the biological yield and expressed as percentage (%). This all the numerical observation were done by as the standard analytical procedures. Analysis of variance for split plot design and significance of variance was tested by f-test. Critical difference for examining treatment means for their significance was calculated at 5% significance. Pooled analysis of two years was worked out as per the procedure suggested by Panse and Sukhatme (1967). Bartlett's test was applied to examine the homogeneity of variance due to error. The variance obtained due to season x treatment components were tested against joint 54 estimate of error variance with an objective to find out whether season x treatment interaction exist or otherwise.

RESULTS AND DISCUSSION

A) Effect of Intercropping System

Plant Population

Upon examining the data presented in Table 1, it was observed that the initial and final plant population of pearl millet per net plot was not affected significantly by intercropping. This indicates that the variations in the parameter results were solely due to the effects of the treatments. Moreover, it can be inferred that pearl millet plants were able to thrive and survive in the competitive environment created by intercropping with greengram, blackgram and cowpea.

Growth Parameters

It is evident from data (Table 1) that the periodical plant height and dry matter accumulation per plant of pearl millet was significantly influenced by intercropping system at 60 DAS and at harvest. However, there was no significant effect observed at 30 DAS. Significantly higher plant height of pearl millet at 60 DAS and harvest was observed with the treatment I_2 (pearl millet + greengram) being at par with I_3 (pearl millet + blackgram) and I_4 (pearl millet + cowpea). Although the treatment I_1 (sole pearl millet) resulted in significantly higher values of dry matter accumulation per plant at 60 DAS and at harvest, but it remained

at par with treatments I_2 (pearl millet + greengram) and I_3 (pearl millet + blackgram). Higher dry matter accumulation per plant in sole pearl millet compared to intercropping systems can be attributed to reduced population pressure and inter-specific competition of intercrops for space, sunlight and nutrients. This, in turn leads to better and more vegetative growth per plant ultimately increasing the dry matter accumulation per plant of pearl millet (Mukta *et al*., 2005).

Yield attributes

All the yield contributing characters of pearl millet influenced significantly due to intercropping systems except earhead girth and test weight. Among the intercropping system, sole pearl millet registered statistically higher values of yield contributing characters of pearl millet *viz.*, number of effective tillers per plant, earhead length, earhead weight and grain weight per earhead which were found at par with treatment I_2 (pearl millet + greengram) and I_3 (pearl millet + blackgram). This can be attributed to the complementary interaction between intercrops and pearl millet which provide better environmental condition and nutrient from intercrops (Choudhary, 2009). Whereas, earhead girth and 1000 grain weight of pearl millet was not influenced significantly by intercropping systems. These results indicated that the presence of greengram or blackgram as intercrops with pearl millet did not have a negative impact on the yield attributed of pearl millet.

Yield

Grain and straw yield of pearl millet were significantly influenced by the intercropping system. Sole pearl millet (I_1) which was statistically at par with pearl millet + greengram (I_2) and pearl millet + blackgram (I_3) showed significantly higher grain and straw yield of pearl millet. The higher yield in sole stands of pearl millet over intercrop might be due to limited disturbance of the habitat and interactional competition in the sole cropping environment. It is reasonable to suggest that two species with contrasting habits in terms of branching, leaf distribution, height, root distribution, mineral uptake, or other morphological or physiological characteristics will be able to exploit the total environment more effectively than a monoculture, resulting in increased overall yield.

Whereas, it is interesting to note that pearl millet + greengram (I_2) intercropping system recorded significantly higher pearl millet equivalent yield among the systems which was approximately, 12, 29 and 80 per cent higher over pearl millet + blackgram, pearl millet + cowpea and sole pearl millet, respectively due to better utilization of resources and complimentary interaction between components crops as well as extra yield and high market price of greengram. These findings are in contrast with the results of Baldev *et al.* (2005) and

Mukta *et al.* (2005). There is non-significant effect of intercropping system on harvest index of pearl millet.

B) Effect of Nutrient Management

Plant population

An appraisal of the data presented in Table 1 revealed that nutrient management treatments did not have a significant effect on the initial and final plant population of pearl millet. This indicates that the nutrient management treatments had no adverse effects on the plant population of pearl millet.

Growth Parameters

The impact of different treatment of nutrient management practices on growth parameters had significant at 60 DAS and at harvest but not at 30 DAS. Application of 5 t/ha FYM + RDF through inorganic fertilizer on base of STV (F_4)resulted in significantly higher plant height and dry matter accumulation per plant of pearl millet at 60 DAS and harvest followed by treatment F_3 (5 t/ha FYM + 100% RDF through inorganic fertilizer. The results might be due to application of chemical fertilizer with FYM based on STV will help to increased nutrient availability on poor soil of experimental field had low availability of nitrogen and medium availability of phosphorus. This might have facilitated early root formation and establishment of the crop leading to an increase in plant height as well as accessibility of nitrogen to plants at different crop growth stages have closely synchronized to the nutrients requirements leading to better absorption, translocation and assimilation of nitrogen by pearl millet plants which intensifies metabolic activity including amino acids, proteins, nucleic acids, enzymes, coenzymes, alkaloids and variety of hormones production leading to significant increase in dry matter yield (Apoorva *et al*., 2010).

Yield attributes

Significant difference were recorded among nutrient management practices with respect to yield contributing parameters *viz.,* number of effective tillers per plant, earhead girth, earhead length, earhead weight and grain weight per earhead of pearl millet at harvest. While, 1000 grains weight of pearl millet was not remarkably influenced due to nutrient management. Statistically higher number of effective tillers per plant as well as higher value of earhead girth, earhead length, earhead weight and grain weight per earhead of pearl millet was observed with application of 5 t/ha FYM + RDF through inorganic fertilizer on base of STV (F_4) to pearl millet which was at par with treatment F_3 (5 t/ha FYM + 100% RDF through inorganic fertilizer). Application of inorganic fertilizer with FYM increased availability of major plant nutrients to plants initially through inorganic fertilizer and

subsequent mineralization of FYM. This yield attribute seems to have been brought about by adequate nutrient supply promotes photosynthetic activity and increases the production of assimilates such as sugars, which are transported to the developing earhead. This increased biomass accumulation provides the necessary energy and resources for the growth and elongation of the earhead contributing to its increased length, weight and girth. The similar results were obtained by Salim and Aljawhara (2017).

Yield

As regards to the performance of pearl millet in terms of grain and straw yield as well as equivalent yield under different nutrient management treatments, a significant response to nutrient application was noticed from no application of fertilizer to 100% RDF. It was interesting to noted that significantly higher grain and straw yield as well as equivalent yield of pearl millet was obtained under treatment F_4 (5 t/ha FYM + RDF through inorganic fertilizer based on STV) which remained statistically at par with treatment F_3 (5 t/ha FYM + 100% RDF through inorganic fertilizer) over other treatments. Whereas, harvest index of pearl millet was not influenced significantly by nutrient management treatments. The significant increase in yield of pearl millet with these treatment (F_4 & F_3) may be due to adequate supply of essential elements which facilitated better growth and development of pearl millet *via*., increase in plant height, dry matter accumulation and possibly a result of higher uptake of nutrients, efficient partitioning of photosynthates into reproductive parts and also due to significantly higher values of yield attributes ultimately resulted in higher yield of pearl millet. Similarly, Apoorva *et al*. (2010) and Kumar *et al*. (2014) observed that increasing nutrient supply to pearl millet will help to increased grain yield of pearl millet.

C) Interaction Effect

The interaction effect of intercropping system and nutrient management showed significant difference in dry matter accumulation per plant at 60 DAS and harvest, earhead weight, grain weight per earhead as well as grain and straw yield of pearl millet. Treatment combination I_1F_4 (sole pearl millet along with 5 t/ha FYM + RDF through inorganic fertilizer on base of STV) resulted in significantly higher dry matter accumulation per plant at 60 DAS and harvest, earhead weight, grain weight per earhead, grain and straw yield but it remained statistically at par with treatment combinations I_1F_3, I_2F_4, I_2F_3, I_3F_4, I_3F_3, I_4F_4 and I_4F_3. While pearl millet equivalent yield was recorded significantly higher under treatment combination I2F4 (pearl millet + greengram intercropping system along with application of 5 t/ha FYM + RDF through inorganic fertilizer on base of STV) and it was found at par with I_2F_3 (pearl millet + greengram intercropping system along with application of 5 t/ha FYM + 100% RDF

through inorganic fertilizer). The findings are in accordance with the work of Gaina *et al*. (2014) and Patel (2021).

CONCLUSION

From the result of two year study, it can be concluded that for obtaining proper growth and profitable yield, pearl millet + greengram (2:1 row ratio) intercropping system along with application of 5 t/ha FYM + 100% RDF through inorganic fertilizer (80:40:00 NPK kg/ha) to pearl millet and 100% RDF to greengram (area based) should be followed during summer season under south Gujarat condition

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Table: 1 Effect of intercropping system and nutrient management treatments on plant population and growth attributes of pearl millet (pooled data)

Treatments	Plant population (Per net plot)		Plant height (cm)			Dry matter accumulation per plant (g)		
	20 DAS	Harvest	30 DAS	60 DAS	Harvest	30 DAS	60 DAS	Harvest
I) Main plot treatment (Intercropping system)								
I_1: Sole pearl millet	190	182	49.26	127.2	155.7	10.96	31.91	73.05
I_2: Pearl millet + greengram	186	180	48.68	140.8	170.7	10.71	31.58	72.09
I_3: Pearl millet + blackgram	185	179	48.36	138.7	168.6	10.59	31.12	70.70
I_4: Pearl millet + cowpea	186	179	47.97	135.7	164.3	10.53	28.65	64.34
SEm ±	2.13	2.37	0.66	1.86	2.10	0.17	0.43	1.15
CD (P ≤ 0.05)	**NS**	**NS**	**NS**	5.74	6.49	**NS**	1.34	3.57
CV (%)	6.84	7.90	8.17	8.24	7.66	9.58	8.48	9.93
F) Sub plot treatment (Nutrient management)								
F_1: Control (No fertilizer)	185	180	47.50	126.9	147.2	10.38	24.04	57.43
100% RDF to pearl millet through inorganic fertilizer	187	181	48.41	136.6	166.8	10.73	29.76	71.05
5 t/ha FYM + 100% RDF through inorganic fertilizer	186	179	50.08	140.6	172.2	10.99	35.04	74.65
5 t/ha FYM + RDF through inorganic fertilizer on base of STV	187	180	49.33	141.6	173.5	10.83	35.23	76.85
25% RDN through FYM + 75% RDF through inorganic fertilizer	186	180	48.19	135.5	168.0	10.75	31.13	72.28
50% RDN through FYM + 50% RDF through inorganic fertilizer	188	183	47.89	132.4	161.2	10.50	29.68	68.02
SEm ±	2.34	2.57	0.75	2.16	2.51	0.19	0.38	1.03
CD (P ≤ 0.05)	**NS**	**NS**	**NS**	6.09	7.09	**NS**	1.07	2.92
CV (%)	6.67	6.98	7.60	7.82	7.48	8.59	6.04	7.26
Interaction effect (I × F)								
SEm ±	4.68	5.14	1.51	4.33	5.03	0.38	0.76	2.07
CD (P ≤ 0.05)	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	2.13	5.85
Significant interaction with years	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

Table: 2 Effect of intercropping system and nutrient management treatments on yield attributes of pearl milletcrop (pooled data)

Treatments	Effective tillers per plant	Earhead			Grain weight per earhead (g)	Test weight (g)
		Girth (cm)	Length (cm)	Weight (g)		
I) Main plot treatment (Intercropping system)						
I_1: Sole pearl millet	2.26	8.51	25.03	23.79	10.25	6.99
I_2: Pearl millet + greengram	2.18	8.37	24.46	23.23	10.01	6.93
I_3: Pearl millet + blackgram	2.15	8.27	23.92	22.85	9.83	6.90
I_4: Pearl millet + cowpea	1.99	8.13	21.82	20.96	9.03	6.79
SEm ±	0.03	0.13	0.42	0.37	0.16	0.08
CD (P ≤ 0.05)	0.11	**NS**	1.29	1.16	0.51	**NS**
CV (%)	10.09	9.34	10.61	9.96	10.19	7.47
F) Sub plot treatment (Nutrient management)						
F_1: Control (No fertilizer)	1.98	7.70	17.94	17.16	7.36	6.71
100% RDF to pearl millet through inorganic fertilizer	2.10	8.21	24.24	22.27	9.54	6.83
5 t/ha FYM + 100% RDF through inorganic fertilizer	2.30	8.78	25.86	25.48	11.04	7.04
5 t/ha FYM + RDF through inorganic fertilizer on base of STV	2.32	8.87	26.13	25.57	11.11	7.03
25% RDN through FYM + 75% RDF through inorganic fertilizer	2.10	8.28	24.91	23.55	10.10	6.94
50% RDN through FYM + 50% RDF through inorganic fertilizer	2.06	8.09	23.78	22.23	9.54	6.87
SEm ±	0.04	0.13	0.43	0.32	0.14	0.09
CD (P ≤ 0.05)	0.11	0.37	1.22	0.91	0.39	**NS**
CV (%)	9.34	7.79	8.95	7.04	7.04	6.90
	Interaction effect (I × F)					
SEm ±	0.08	0.26	0.87	0.65	0.28	0.19
CD (P ≤ 0.05)	**NS**	**NS**	**NS**	1.83	0.79	**NS**
Significant interaction with years	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

Table: 3 Effect of intercropping system and nutrient management treatments on yield and harvest index of both crop as well pearl millet equivalent yield (pooled data)

Treatments	Pearl millet yield			Intercrop yield			Pearl millet equivalent yield (kg/ha)
	Yield (kg/ha)		Harvest index	Yield (kg/ha)		Harvest index	
	Grain	Straw		Grain	Haulm		
I) Main plot treatment (Intercropping system)							
I_1: Sole pearl millet	2562	5551	0.32	-	-	-	2562
I_2: Pearl millet + greengram	2502	5485	0.31	532	819	0.39	4603
I_3: Pearl millet + blackgram	2461	5391	0.32	438	743	0.36	4076
I_4: Pearl millet + cowpea	2258	4878	0.32	396	796	0.32	3510
SEm ±	36.09	83.98	0.004	-	-	-	56.48
CD (P ≤ 0.05)	111.0	259	**NS**	-	-	-	174
CV (%)	8.85	9.46	7.44	-	-	-	9.19
F) Sub plot treatment (Nutrient management)							
F_1: Control (No fertilizer)	1839	3933	0.32	194	469	0.29	2374
100% RDF to pearl millet through inorganic fertilizer	2387	5110	0.32	407	698	0.37	3498
5 t/ha FYM + 100% RDF through inorganic fertilizer	2767	6196	0.31	622	975	0.39	4458
5 t/ha FYM + RDF through inorganic fertilizer on base of STV	2776	6232	0.31	629	994	0.39	4486
25% RDN through FYM + 75% RDF through inorganic fertilizer	2524	5393	0.32	450	826	0.35	3752
50% RDN through FYM + 50% RDF through inorganic fertilizer	2382	5093	0.32	430	755	0.36	3558
SEm ±	35.16	77.67	0.004	-	-	-	48.75
CD (P ≤ 0.05)	99.00	219	**NS**	-	-	-	137.0
CV (%)	7.04	7.14	5.72	-	-	-	6.48
Interaction effect (I × F)							
SEm ±	70.32	155.3	0.007	-	-	-	97.50
CD (P ≤ 0.05)	198.0	437.0	**NS**	-	-	-	274.0
Significant interaction with years	**NS**	**NS**	**NS**	-	-	-	**NS**

Table: 4Interaction effect of intercropping system and nutrient management treatments on pearl millet (pooled data)

Nutrient management	Dry matter accumulation/plant (g)				Earhead weight (g)				Grain weight per earhead (g)			
	I_1	I_2	I_3	I_4	I_1	I_2	I_3	I_4	I_1	I_2	I_3	I_4
F_1	60.91	64.30	61.32	43.18	17.12	19.28	18.82	13.43	7.34	8.27	8.06	5.76
F_2	73.38	71.29	70.21	69.33	23.35	22.35	21.83	21.54	10.01	9.59	9.37	9.19
F_3	76.43	75.07	73.88	73.21	26.56	25.40	25.13	24.84	11.53	11.02	10.81	10.81
F_4	79.15	77.24	76.43	74.59	26.62	25.45	25.21	24.99	11.56	11.06	10.96	10.86
F_5	74.62	72.69	71.54	70.28	24.65	23.54	23.16	22.85	10.57	10.10	9.93	9.80
F_6	73.83	71.95	70.83	55.46	24.46	23.38	22.98	18.10	10.49	10.03	9.86	7.77
SEm±	2.07				0.65				0.28			
CD ($P \leq 0.05$)	5.85				1.83				0.79			
CV (%)	7.26				7.04				7.04			
Nutrient management	Grain yield (kg/ha)				Straw yield (kg/ha)				Pearl millet equivalent yield (kg/ha)			
	I_1	I_2	I_3	I_4	I_1	I_2	I_3	I_4	I_1	I_2	I_3	I_4
F_1	1835	2067	2017	1439	4156	4468	4228	2879	1835	3136	2638	1887
F_2	2502	2396	2340	2309	5293	5139	5071	4936	2503	4316	3754	3420
F_3	2882	2758	2729	2699	6347	6217	6147	6071	2882	5511	4978	4463
F_4	2889	2764	2738	2714	6394	6260	6205	6068	2890	5537	5015	4500
F_5	2642	2523	2482	2450	5591	5418	5357	5205	2643	4598	4086	3680
F_6	2621	2506	2463	1940	5523	5405	5336	4110	2622	4520	3981	3109
SEm±	70.32				155.3				97.50			
CD ($P \leq 0.05$)	198				437				274.4			
CV (%)	7.04				7.14				6.48			