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Vivek Patel
Department of Soil Science and Agricultural Chemistry Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

SS Sengar
Department of Soil Science and Agricultural Chemistry Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

RK Singh
Department of Agronomy, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

AK Singh
Department of Agricultural Statistics & Social Science Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

Rajesh Kumar
Department of Soil Science and Agricultural Chemistry Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

Onkar Singh
Department of Soil Science and Agricultural Chemistry Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

Corresponding Author:
Vivek Patel
Department of Soil Science and Agricultural Chemistry Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

Primary nutrient content and its uptake in little millet (*Panicum sumatrense*) as influenced by different nutrient management and seed priming

Vivek Patel, SS Sengar, RK Singh, AK Singh, Rajesh Kumar and Onkar Singh

Abstract
A field experiment was conducted in the experimental plots of DKS farm, IGKV, Bhatapara Dist- Baloda Bazaar, Chhattisgarh during *kharif* season of the year 2019. The soil of the experimental field was alfisol and climate was sub-humid with a total rainfall of 872.2 mm during the crop growth. The objectives of experiment were to the study the effect of various nutrient management and seed priming treatments on N, P and K content and uptake of little millet. The experiment was laid out in split-plot design. The treatments constituted with five nutrient management N1 (control), N2 (125 kg Neem cake + 1.25 tons ha^{-1} vermicompost), N3 (50"Kg/ha N : 50 Kg/ha P_2O_5 : 50 Kg /ha K_2O"and 2% Borax spray at flowering), N4 (125 Kg Neem cake + 1.25 tons ha^{-1} vermicompost + 50 Kg/ha N : 50 Kg/ha P_2O_5 : 50 Kg /ha K_2O and 2% Borax spray at flowering) and N5 (Recommended" dose of fertilizer i.e. 20 Kg/ha N": 20 Kg/ha P_2O_5 : 10 Kg /ha K_2O) in main plots with four priming treatment P1 (control), P2 (Hydro priming for 8 hrs), P3 (Seed priming with 2% KH_2PO_4 for 8 hrs) and P4 (Seed priming with 20% liquid *Pseudomonas fluorescens*) in sub plots. Results revealed that the nitrogen, phosphorus, and potassium contents in plant tissue were not affected significantly by nutrient management and seed priming treatments. However, the nutrient uptake of nitrogen, phosphorus, and potassium were found in higher range where either higher doses of chemical fertilizers or the chemical fertilizers in combination with organic manures were applied. No significant effect of seed priming was seen for nutrient uptake of these elements by plants.

Keywords: little millet, primary nutrient, priming.

1. Introduction

Millets are known for store-houses of nutrition as on dietary criterion, as compared with rice and wheat. Millets nutritional composition varied species to species and is depended on the generic as well as the environmental factors (McDonough *et al*., 2000) [8]. The Government of India has declared the year 2018, as "National Year of Millets" and designated "Millets" as "Nutri-Cereals" to recognize the nutritional and socio-economic importance. Millets are adapted to wide range of temperatures, soil-moisture regimes and input conditions supplying food and feed for a large segment of the population, especially those with low socio-economic status particularly in the developing world. All these have made millets quite indispensable to tribal, rainfed and hill agriculture where crop substitution is challenging. Besides, many types of mill*et al*so form major raw material for potable alcohol and starch production in industrialized countries.

Little millet (*Panicum sumatrense* Roth ex Roemer and Schultes), known as kutki in hindi, Samai in tamil, same in kannada, samalu in telugu, chama in malayalum, sava in Marathi, gajaro in gujrati and kangani in Bengali is one of the hardiest short duration minor cereal crop belong to the family Poaceae (Gramineae) and is indigenous to Indian sub continent. The species name is based on a specimen collected from Sumatra (Indonesia) (de Wet *et al*., 1983) [3]. Little millet is widely grown in India, Sri Lanka, Pakistan and Western Myanmar. Little millet can tolerate water logging and drought conditions (Rachie, 1975) [12]. Seed priming is a prescribed hydration process which involves soaking of seed in water and drying back to storage moisture that check germination, but permits pre-germinative physiological and biochemical processes to occur (Rinku *et al*., 2017) [16]. These processes that precede the germination are triggered by priming. Therefore, primed seed rapidly imbibe and revive the seed metabolism resulting in higher seed viability and vigour and a reduction in intrinsic physiological heterogeneity in germination and crop stand. There are various methods of priming of seeds. Some of scientists consider the hydro priming superior to other methods.

Whereas nutrient priming is considered to be novel technique that combine the positive effects of seed priming with an improved nutrient supply. The productivity of little millet is very low on account of inadequate and imbalanced application of fertilizers, non-addition of secondary and micronutrients, organic manure as well as bio fertilizers. Another reasons for low productivity is the use of locally available untreated seeds. In view of above fact present study was undertaken to study the effect of nutrient management and seed priming on N, P and K content and its uptake in little millet.

2. Materials and Methods

2.1 Study Site Description

The field experiment was conducted at DKS farm, IGKV, Bhatapara, Dist- Baloda Bazar, Chhattisgarh during *kharif* season, 2019. Experimental site was situated at 21°45'25" North latitude and 81° 59'22" East longitudes having an altitude of about 930 m above Mean sea level (MSL).

2.2 Experimental details

The field experiment was conducted in split plot design with three replications. The soil was silty clay loam with neutral pH, non-saline condition, and medium in organic carbon content, low in available nitrogen and sulphur, medium in available phosphorus and high in available potassium, calcium, magnesium and available DTPA extractable micronutrients content. Treatments constituted with five nutrient management N1 (control), N2 (125 kg Neem cake + 1.25 tons ha^{-1} vermicompost), N3 (50"Kg/ha N : 50 Kg/ha P_2O_5 : 50 Kg /ha K_2O"and 2% Borax spray at flowering), N4 (125 Kg Neem cake + 1.25 tons ha^{-1} vermicompost + 50 Kg/ha N : 50 Kg/ha P_2O_5 : 50 Kg /ha K_2O and 2% Borax spray at flowering) and N5 (Recommended dose of fertilizer i.e. 20 Kg/ha N": 20 Kg/ha P_2O_5 : 10 Kg /ha K_2O) in main plots with four priming treatment P1 (control), P2 (Hydropriming for 8 hrs), P3 (Seed priming with 2% KH_2PO_4 for 8 hrs) and P4 (Seed priming with 20% liquid *Pseudomonas fluorescens*) in sub plots. Magnesium through MgSO4 @ 20 Kg $acre^{-1}$ and calcium CaO @ 6 kg $acre^{-1}$ was applied uniformly in all the plots before seeding except control treatment plots.

2.3 Cultivation details

The experimental field was dry ploughed twice and later leveled uniformly. Field was laid out and prepared bunds for 60 individual plots. Nine lines were demarked manually with the help of mattock for line sowing of little millet. Direct seeding method was adopted for sowing the little millet after priming as per treatments. Seeds were shown at 3-4 cm depth manually. Thinning was performed four days after seeding to maintain desired plant to plant spacing of 30 × 10 cm, and to maintain desired plant population. Being a rainfed crop under study, there was no single irrigation applied to the field. Crop experiment was totally dependent on rainfall occurred during the crop season that was 872.2 mm. Manual weeding by hand was performed at 30 DAS, for control of weeds and keeps the crop weed competition at minimum level during critical period for weed control. Fertilizers were applied as per the treatments. One third of nitrogen, full dose of phosphorous and full recommended dose of potassium were applied in the form of urea, SSP and MOP as basal dose at the time of sowing. One-third nitrogen required was applied at maximum tillering stage as urea and remaining one-third nitrogen was applied at panicle initiation stage as urea. Magnesium through MgSO4 @ 20 Kg $acre^{-1}$ and calcium CaO @ 6 Kg $acre^{-1}$ was applied uniformly in all the plots before seeding except control treatment plots. 2% Borax spray application was done at the time of flowering. The crop was affected from stem borer. However, monocrotophos @ 1.5ml/liter of water was sprayed at maximum tillering stage (45 DAS). The crop was harvested manually at 90 DAS. The five representative sample plants were harvested separately, and then crop was harvested from net plot area and kept for threshing. The plants from each plot were sun dried properly to facilitate easy threshing. Threshing was performed manually using the wooden sticks followed by winnowing.

2.4 Observations recorded

From each plot, grain and straw yields were recorded for five sample plant and whole plot separately. The straw was sun dried properly in field and the yield was recorded. The grain weight was taken after threshing the crop for each plot, separately. The grain and straw yields were expressed as kg ha^{-1}. Plant samples were collected at harvest of little millet and were oven dried with hot air oven until the constant weight was achieved. Dried samples were prepared by grinding grain and straw samples, separately with grinding machine and analyzed for plant nutrients content. For nitrogen estimation 0.25 gm of prepared plant samples were taken and transferred to digestion tube. Then 1 gm of salt mixture was added to these plant samples in the digestion tube followed by addition of 5 ml of concentrated sulphuric acid and left for pre digestion overnight. Next morning, the digestion tubes were digested with the help of digester. Total nitrogen was estimated by micro-kjeldhal as per procedure suggested by AOAC (1995). For other macronutrient one gram of powdered sample was digested with 10ml di-acid mixture (nitric acid and perchloric acid at 10:4) after overnight pre digestion. The white residue left at the bottom of flask was diluted with water to known volume after filtration. This extract was used in the estimation of P, K, Ca, Mg, S and micronutrients. Phosphorus content of plant samples were measured by vanado molybdo phosphoric acid yellow color method using an aliquot of diacid digested sample. The intensity of yellow color developed was measured at 430 nm using spectrophotometer (Jackson, 1973) [5]. Potassium content of plant samples were determined by using the diacid digested extract. The reading of potassium was taken with the help of flame photometer (Chapman and pratt, 1961) [1]. The calcium and magnesium in the diacid extract of plant sample was determined by using ammonium chloride-ammonium hydroxide buffer and Eriochrome Black T indicator by titrating it against versenate solution. Calcium was estimated by titrating the diacid extract of the plant sample against the versenate solution in presence of sodium hydroxide and mureixide (Piper, 1966) [10]. Uptake of N, P and K was calculated using the grain and straw yields and nutrient content using the formula

$$\text{Uptake (kg ha}^{-1}) = \frac{\text{(\%) nutrient content in plant material} \times \text{yield (kgha}^{-1})}{100}$$

3. Results and Discussion

3.1 Effect of different nutrient management and seed priming on N, P and K content of little millet.

Nutrient content of little millet grain followed the order N>K>P where as in little millet straw, K content was highest followed by N and then by P content. The range of variation in primary nutrient content for different treatment combinations was also small. Nitrogen content ranged from 1.34% to 1.37% in grain and from 0.63% to 0.68% in straw. Phosphorus content in little millet grain ranged from 0.46% to 0.50% and in straw it ranged from 0.24% to 0.25%. Higher content of potassium was found in straw than grain and it ranged from 0.49% to 0.50% for grain and 1.16% to 1.18% for straw. Higher nutrient content of N (1.37%), P (0.50%) and K (1.18%) in grain was associated with N4 treatment. Similarly higher N (0.68%), P (0.25%) and K (1.18%) content in little millet straw were associated with N4 treatment. This might be due to increased nutrient availability of nutrients and higher meristematic activities of top and roots of the plants. However, it differed non-significantly from other treatments might be due to dilution effect, and higher plant available nutrient status of soil. Similar results were reported by Mondal *et al*. (2016) [9] and Rani *et al*. (2017) [13].

No trend was found for priming treatments for nutrient content and treatment differed non- significantly due to priming treatments. This might be due to higher rainfall during crop growth. Also, no interaction effect was observed for N×P. similar results were reported by Zida *et al*. (2017) [18] and Damalas *et al*. (2019) [2].

Table 1: Effect of “integrated nutrient management” and seed priming on N, P and K content of little millet.

Treatment	**Nitrogen content (%)**		**Phosphorus content (%)**		**Potassium content (%)**	
Nutrient management	Grain	Straw	Grain	Straw	Grain	Straw
N1: Control	1.34	0.64	0.46	0.25	0.5	1.18
N2:125 kg Neem cake + 1.25 tons ha^{-1} vermicompost	1.35	0.63	0.46	0.24	0.49	1.17
N3: 50 kg/ha N: 50 kg/ha P_2O_5: 50 kg /ha K_2O and 2% Borax spray at flowering.	1.36	0.65	0.48	0.24	0.5	1.17
N4: N2+N3	1.37	0.68	0.5	0.24	0.5	1.16
N5: Recommended dose of fertilizer i.e. 20 kg/ha N : 20 kg/ha P_2O_5 : 10 kg /ha K_2O	1.35	0.65	0.48	0.25	0.5	1.18
SEm±	**0.02**	**0.01**	**0.01**	**0**	**0.01**	**0.02**
C.D.(P=0.05)	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
Priming						
P1: Control	1.36	0.66	0.48	0.25	0.49	1.17
P2: Hydro priming for 8 hrs	1.35	0.65	0.47	0.24	0.5	1.16
P3:Seed priming with 2% KH_2PO_4 for 8 hrs	1.34	0.65	0.49	0.24	0.5	1.17
P4: Seed priming with 20% liquid *Pseudomonas fluorescens.*	1.36	0.63	0.46	0.24	0.5	1.18
SEm±	**0.02**	**0.01**	**0.01**	**0**	**0.01**	**0.02**
C.D.(P=0.05)	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
Interaction	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

3.2 Effect of integrated nutrient management and seed priming on N, P and K uptake of little millet.

3.2.1“Effect of integrated nutrient management and seed priming on Nitrogen uptake (kg/ha).

Nitrogen uptake of little millet grains varied from 11.77 kg/ha to 13.7 kg/ha. The highest N uptake in little millet grains was found in N4 treatment (13.7 kg/ha) which was at par with N3 treatment (13.38 kg/ha) and significantly higher than N2 (12.69 kg/ha) and N1 treatment (11.77 kg/ha). The lowest N uptake in little millet grains was found in N1 treatment (11.77 kg/ha). In case of little millet straw, N uptake varied from 52.98 kg/ha to 64.05 kg/ha. The highest N uptake in little millet straw was found in N4 treatment (64.05 kg/ha) which was at par with N3 treatment (61.58 kg/ha) and significantly higher than the other treatments. The lowest N uptake was found in N1 treatment (11.77 kg/ha).Total N uptake of little millet varied from 64.75 kg/ha to 77.74 kg/ha. Trend remains same for total N uptake and the highest N uptake was found in N4 (77.74 kg/ha) which was at par with N3 (74.96 kg/ha) and significantly higher than the N1, N2 and N5 treatments. The lowest total N uptake was found in N1 treatment (64.75 kg/ha).

Nitrogen uptake of little millet grains and straw and total N uptake differed non-significantly between priming treatments. The highest N uptake of little millet grains was found in P4 (13.3 kg/ha) and the lowest N uptake in little millet grains was recorded in P1 treatment (12.72 kg/ha). In case of little millet straw, the highest N uptake was found in P3 (59.69 kg/ha) and the lowest N uptake was recorded in P4 treatment (56.86 kg/ha).The highest total N uptake was found in P3 treatment (72.75 kg/ha) and the lowest total N uptake was recorded in P4 treatment (70.76 kg/ha).The interaction effect of N×P for N uptake of little millet grain and straw for total N uptake was found to be differed non-significantly.

The increased uptake of nitrogen in integrated nutrient management plots might be due to increased dry matter production and due to balanced release of these nutrients into soil upon manure decomposition, which resulted in vigorous growth and uptake of nutrients. Similar results were reported by Divyashree *et al*. (2017) [4] and Roy *et al*. (2018) [17].

3.2.2“Effect of integrated nutrient management and seed priming on Phosphorus uptake (kg/ha).

Phosphorus uptake of little millet grains varied from 4.08 kg/ha to 4.97 kg/ha. Highest P uptake by little millet grain was found in N4 (4.97 kg/ha) which was statistically similar to N3 treatment (4.71kg/ha) and significantly higher than the other treatments. The lowest P uptake was found in N1 treatment (4.08 kg/ha). In case of straw, P uptake of little millet straw varied from 20.42 kg/ha to 23.05 kg/ha. The highest P uptake was found in N4 treatment (23.05 kg/ha) which was significantly higher than the other treatments. The lowest P uptake was found in N1 treatment (20.42 kg/ha).Total P uptake of little millet varied from 24.50 kg/ha to 28.02 kg/ha. The highest total P uptake was found in N4 treatment (28.02 kg/ha) which was at par with N3 (27.17 kg/ha) and significantly higher than N1, N2 and N5 treatment and the lowest P uptake was found in N1treatment (24.50 kg/ha).

Phosphorus uptake in little millet grains and straw and total P uptake differed non-significantly between priming treatments. The highest P uptake in grains was found in P3 treatment (4.75 kg/ha) and the lowest P uptake was recorded in P2 treatment (4.35 kg/ha). In case of straw, highest P uptake was found in P1 treatment (22.16 kg/ha) and the lowest P uptake was recorded in P2 treatment (21.65 kg/ha).Total uptake of P by crop was found highest in P3 treatment (26.73 kg/ha) and the lowest P uptake was recorded in P2 treatment (26 kg/ha).

No interaction effect of N×P for P uptake of grains, straw and total P uptake was found significant.

The increased uptake of phosphorus by little millet in integrated nutrient management might be due to solubilizing effect of organic acids which are produced from the decomposition of organic matter and reducing the fixation of phosphorus and increasing the availability of phosphorus resulting in higher dry matter mass production and uptake of phosphorus by little millet. Similar results were reported by Khan *et al*. (2011) [6] and Prabudoss *et al*. (2014) [11].

3.2.3 Effect of integrated nutrient management and seed priming on Potassium uptake (kg/ha).

Potassium uptake of little millet grains varied from 4.36 kg/ha to 5.0 kg/ha. The highest K uptake of little millet grains was found in N4 treatment (5.0 kg/ha) which was at par with N3 treatment (4.87 kg/ha) and significantly higher than N2 (4.64kg/ha) and N1 treatment (4.36 kg/ha). The lowest K uptake was found in N1 treatment (4.36 kg/ha). In case of K uptake of little millet straw, variation was recorded from 97.85 kg/ha to 109.9 "kg/ha. The highest K uptake by little millet in straw was found in N4 treatment (109.9 kg/ha) which was at par with"N3 (109.76 kg/ha) and significantly higher to N2 (100.7 kg/ha) and N1 treatment (97.85 kg/ha). The lowest K uptake by little millet straw was found in N1 (97.85 kg/ha).Total K uptake of little millet crop varied from 102.2 kg/ha to 114.9 kg/ha. The highest K uptake was found in N4 treatment (114.9 kg/ha) which was at par with N3 (114.62 kg/ha) and significantly higher than N1, N2 treatment. The lowest N uptake was found in N1 treatment (102.2 kg/ha).

Potassium uptake of little millet in grains, straw and total K uptake differed non-significantly between priming treatments. The highest K uptake was found in P4 treatment (4.89 kg/ha) and the lowest K uptake was recorded in P1 treatment (4.60 kg/ha).In case of straw, the highest K uptake was found in P3 treatment (106.94 kg/ha) and the lowest K uptake was recorded in P2 (102.85 kg/ha).Total K uptake by little millet crop was highest in P3 (111.78 kg/ha) and the lowest K uptake was recorded in P2 (107.44 kg/ha). The interaction effect of N×P for K uptake by little millet grain, straw and total K uptake was found to be differed non-significantly.

The highest potassium uptake might be because, potassium is likely to be maintained in exchangeable form in soils treated with organic manures due to high exchange capacity of organic colloids formed during decomposition of organic manure which in turn restricted the K^+ ions getting fixed by inorganic clay particles in soil which resulted in increased growth parameters and higher K uptake by little millet. Similar results were also reported by Mondal *et al*. (2016) [9] and Roy *et al*. (2018) [17].

Table 2: Effect of integrated nutrient management and seed priming on N, P and K uptake of little millet.

Treatment	**Nitrogen Uptake (kg/ha)**			**Phosphorus Uptake (kg/ha)**			**Potassium Uptake (kg/ha)**		
Nutrient management	Grain	Straw	total	Grain	Straw	total	Grain	Straw	total
N1: Control	11.77	52.98	64.75	4.08	20.42	24.5	4.36	97.85	102.2
N2:125 kg Neem cake + 1.25 tons ha^{-1} vermicompost	12.69	53.69	66.38	4.37	21.04	25.41	4.64	100.07	104.71
N3: 50 kg/ha N: 50 kg/ha P_2O_5: 50 kg /ha K_2O and 2% Borax spray at flowering.	13.38	61.58	74.96	4.71	22.47	27.17	4.87	109.76	114.62
N4: N2+N3	13.7	64.05	77.74	4.97	23.05	28.02	5	109.9	114.9
N5: Recommended dose of fertilizer i.e. 20 kg/ha N : 20 kg/ha P_2O_5 : 10 kg /ha K_2O	12.87	58.12	70.99	4.57	22.44	27.02	4.72	106.16	110.88
SEm±	**0.23**	**1.28**	**1.35**	**0.09**	**0.43**	**0.45**	**0.1**	**2.55**	**2.63**
C.D.(P=0.05)	**0.76**	**4.17**	**4.41**	**0.29**	**1.41**	**1.48**	**0.33**	**8.31**	**8.56**
Priming									
P1: Control	12.72	58.04	70.76	4.53	22.16	26.68	4.6	103.37	107.97
P2: Hydro priming for 8 hrs	12.44	57.75	70.19	4.35	21.65	26	4.59	102.85	107.44
P3: Seed priming with 2% KH_2PO_4 for 8 hrs	13.06	59.69	72.75	4.75	21.97	26.73	4.84	106.94	111.78
P4: Seed priming with 20% liquid *Pseudomonas fluorescens.*	13.3	56.86	70.16	4.52	21.75	26.28	4.84	105.83	110.67
SEm±	**0.29**	**1.37**	**1.38**	**0.11**	**0.52**	**0.56**	**0.12**	**2.2**	**2.26**
C.D.(P=0.05)	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
Interaction	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

3.3 Effect of integrated nutrient management and seed priming on yield of little millet.

3.3.1 Grain yield.

Grain yield of little millet varied from 8.8 q/ha to 10 q/ha. The highest grain yield was recorded in"N4 treatment (10 q/ha) which was at par with N3 treatment (9.81 q/ha) and significantly higher than the other treatments. The lowest grain yield was recorded in N1 treatment (8.8 q/ha). Grain yield differed non-significantly between priming treatments. The highest grain yield was found in P4 treatment (9.75q/ha) followed by P3 (9.74q/ha) and the lowest yield was recorded in P2 treatment (9.21q/ha). The interaction effect of N×P for grain yield was found to be differed non-significantly. Maximum grain yield was recorded in N3P4 (10.71 q/ha) and the minimum grain yield was recorded in N1P1 treatment combinations (8.52 q/ha). Higher grain yield with combined application of organic manure and inorganic fertilizers may be due to increased availability of nutrients which improved the soil properties, this in turn, increased absorption and translocation of nutrients by crop leading to increased production of photosynthates by the crop. Organic manures provided favorable environment for microorganisms like *Azospirillum* which fixes atmospheric nitrogen available to plant and PSB which converts insoluble phosphate into soluble forms by secreting organic acids. These results are in line with the findings of Malinda *et al*. (2015) [7].

3.3.2 Straw yield.

Straw yield of little millet varied from 83.15 q/ha to 94.72 q/ha. The highest straw yield was recorded in"N4 treatment (94.72 q/ha) which was at par with N3 treatment (94.14 q/ha) and significantly higher than the other treatments. The lowest straw yield was found in N1 treatment (83.15 q/ha). Straw yield differed non-significantly between priming treatments. The highest straw yield was found in P3 treatment (91.51 q/ha) followed by P4 (90.07 q/ha) and the lowest straw yield was recorded in P1treatment (88.14 q/ha). The interaction effect of N×P for straw yield was found to be differed non-significantly. Maximum straw yield was recorded in N4P3 (98.24 q/ha) and the lowest straw yield was recorded in N1P1treatment combinations (80.21 q/ha). Higher straw yield recorded in integrated nutrient management plots may be due to enhancement of the photosynthetic rate resulting in more vegetative growth and dry matter production. These results are in conformity with the findings of Raudal *et al*. (2017) [15].

3.3.3. Biological yield

Biological yield of little millet varied from 91.95 q/ha to 104.72 q/ha. The highest biological yield was found in N4 treatment (104.72 q/ha) which was at par with N3 treatment (103.96 q/ha) and significantly higher than the other treatments. The lowest biological yield was found in N1treatment (91.95 q/ha). Biological yield differed non-significantly between priming treatments. The highest biological yield was found in P3 treatment (101.25 q/ha) followed by P4 (99.82 q/ha) and the lowest biological yield was recorded in P1 treatment (97.47 q/ha). The interaction effect of N×P for biological yield was found to be differed non-significantly. Maximum biological yield was recorded in"N4P3 (108.11 q/ha) and the lowest biological yield was recorded in N1P1 treatment combinations (88.66 q/ha). Greater total yield of little millet in integrated nutrient management is due to enhanced growth and yield parameters. The results obtained were in close conformity of Rani *et al*. (2017) [13] and Raudhal *et al*. (2017) [15]. Seed priming with 20% *Pseudomonas fluorescens* and 2% KH_2PO_4 showed higher yield than hydro priming and control, however their effects were masked by the rainfall on the week of sowing and next week after showing. Similar results were obtained by Zida *et al*. (2017) [18].

Table 2: Effect of integrated nutrient management and seed priming on grain, straw and biological yield of little millet.

Treatment	Grain yield (q/ha)	Straw yield (q/ha)	Biological yield (q/ha)
Nutrient management			
N1: Control	8.80	83.15	91.95
N2:125 kg Neem cake + 1.25 tons ha^{-1} vermicompost	9.41	85.84	95.25
N3: 50 kg/ha N: 50 kg/ha P_2O_5: 50 kg /ha K_2O and 2% Borax spray at flowering.	9.81	94.14	103.96
N4: N2+N3	10.00	94.72	104.72
N5: Recommended dose of fertilizer i.e. 20 kg/ha N : 20 kg/ha P_2O_5 : 10 kg /ha K_2O	9.52	90.07	99.59
SEm±	**0.13**	**1.23**	**1.28**
C.D.(P=0.05)	**0.43**	**4.01**	**4.18**
Priming			
P1: Control	9.33	88.14	97.47
P2: Hydro priming for 8 hrs	9.21	88.61	97.82
P3: Seed priming with 2% KH_2PO_4 for 8 hrs	9.74	91.51	101.25
P4: Seed priming with 20% liquid *Pseudomonas fluorescens.*	9.75	90.07	99.82
SEm±	**0.17**	**1.28**	**1.27**
C.D.(P=0.05)	**NS**	**NS**	**NS**
Interaction	**NS**	**NS**	**NS**

4. Conclusion

Nitrogen, Phosphorus and Potassium content in grain and straw differed non-significantly due to any of the treatments and varied from 1.34% to 1.37%, 0.46% to 0.50% and 0.49% to 0.50% for nitrogen, phosphorus and potassium, respectively in little millet grain and from 0.63% to 0.68%, 0.24% to 0.25% and 1.16% to 1.18% for nitrogen, phosphorus and potassium, respectively in little millet straw.

The nutrient uptake of primary nutrient found significantly high due to enhanced growth and yield parameters in integrated nutrient management. Higher uptake of nitrogen (13.7 kg/ha), phosphors (4.97 kg/ha) and potassium (5.0 kg/ha) was found in N4 treatment in little millet grain, similarly higher uptake of nitrogen (64.05 kg/ha), phosphors (23.05 kg/ha) and potassium (109.90 kg/ha) was found in little millet straw in N4 treatment only.

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