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Effect of foliar application of water-soluble fertilizers on yield and nutrient uptake of summer finger millet (*Eleusine coracana* L.)

SD Parjane, VB Gedam, YG Ban, RH Shinde, SM Shende and PN Gajbhiye

SD Parjane
PG Student, Agronomy Section, RCSM College of Agriculture, Kolhapur, Maharashtra, India

VB Gedam
Agronomist, Regional Sugarcane and Jaggery Research Station, Kolhapur, Maharashtra, India

YG Ban
Junior Breeder, AICRP on Small Millets, Zonal Agriculture Research Station, Shendapark, Kolhapur, Maharashtra, India

RH Shinde
Associated Professor of Agronomy, Agronomy Section, RCSM College of Agriculture, Kolhapur, Maharashtra, India

SM Shende
Assistant Professor of Agronomy, Agronomy Section, RCSM College of Agriculture, Kolhapur, Maharashtra, India

PN Gajbhiye
Assistant Professor of Soil Science and Agricultural Chemistry, Zonal Agriculture Research Station, Shendapark, Kolhapur, Maharashtra, India

Corresponding Author:
SM Shende
Assistant Professor of Agronomy, Agronomy Section, RCSM College of Agriculture, Kolhapur, Maharashtra, India

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Abstract
A field experiment was carried out at Shiroli farm, Regional Sugarcane and Jaggery Research Station, Kolhapur during summer season of 2023 to study the effect of foliar application of water-soluble fertilizers on yield and nutrient uptake of summer finger millet in a randomized block design with ten treatments replicated thrice. The finger millet is grown in *kharif* season and it has good response to the fertilizers in this season and also it gives good yield. But the given experiment is undertaken in summer season to check its yield potential and response to water soluble fertilizers in summer season. Also, the present investigation focuses on ability of nutrient uptake by finger millet. The results revealed that among the various treatments, treatment RDF (60:30:30 NPK kg ha^{-1}) recorded the highest grain and straw yield and highest mean nutrient uptake for nitrogen, phosphorous and potassium while among the different foliar sprays the application of 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage recorded the highest yield and mean nutrient uptake in grain and straw. The lowest values were observed with the treatment absolute control (water spray) at tillering (45 DAS) and flowering (60 DAS) stage.

Keywords: Finger millet, yield, nutrient uptake, water soluble fertilizers, foliar spray, 19:19:19, KNO_3

Introduction

Millets, commonly known as "Nutri-Cereals" owing to their high nutritional value, the United Nations has designated 2023 as the 'International Year of Millets' in response to the proposal from the Government of India, aiming to raise awareness and promote both the production and consumption of millets. Among different millets such as sorghum, pearl millet, finger millet, proso millet and foxtail millet has great importance in Maharashtra farming.

Finger millet in Maharashtra is locally called as *nachani* or *ragi which r*esponds well to the use of fertilizers. Generally, it is grown in in *kharif* season but the experiment has been taken in the summer season to assess the crop response to fertilizers in summer situations. In kharif season it gives good yield but whether in summer season it gives satisfactory yield or not we have undertaken the present investigation. Also, in *kharif* there are many fertilizer losses due to runoff, volatilization and application of fertilizers in soil. Hence to check the response of crop towards the water-soluble fertilizers and its nutrient availability and nutrient uptake we have chosen this experiment. Out of the total minor millets produced, finger millet (*Eleusine coracana* L.) (*ragi/nachani*) accounts for about 85% production in India (Divya, 2011) [5]. In India, finger millet is cultivated over an area of 1.19 million hectares with a production of 1.98 million tonne giving an average productivity of 1661 kg ha^{-1}. Karnataka accounts for 56.21% and 59.52% of area and production of finger millet followed by Tamil Nadu (9.94% and 18.27%), Uttarakhand (9.40% and 7.76%) and Maharashtra (10.56% and 7.16%), respectively. (Anonymous, 2018) [1]. Consumption of fertilizers in India was 139.00 kg ha^{-1} in the year 2019-20 while in Maharashtra it was 149.5 kg ha^{-1} in 2022-23 and for Pune division (Pune, Kolhapur, Sangli, Solapur and Satara) the use of total fertilizer was 961400 MT. (Anonymous, 2022-23) [2].

It has been noted that very meagre work has been done with respect to use of water-soluble fertilizers as a foliar spray especially in summer finger millet and to assess the impact of water-soluble fertilizers on crop growth, yield and overall plant performance hence the present investigation has been undertaken.

Material and Methods

Location: The field experiment was conducted during summer season of 2023 to study the growth and yield of summer finger millet (*Eleusine coracana*) as affected by foliar application of water-soluble fertilizers at Shiroli farm, Regional Sugarcane and Jaggery research Station, Kolhapur.

Soil & climate: The soil of experimental plot was silty loam in texture with slightly acidic pH (6.93). The soil had medium amount of available nitrogen (301.56 kg ha^{-1}) and medium level of available phosphorus (20.02 kg ha^{-1}), while potassium (292.54 kg ha^{-1}) availability was at a moderately high level. During the experimental period the minimum temperature ranged from 12.8 ℃ to 19.9 ℃, while the maximum temperature falls within the range of 29.6 ℃ to 37.5 ℃ and the daily evaporation observed during the experiment varies from 1.7 mm to 7.8 mm. Total rainfall received during the period of field experiment was 29.7 mm in 2 rainy days.

Experimental details: The experiment was laid out in a randomized block design with ten treatments replicated thrice. The finger millet variety *Phule Kasari* was sown directly by line sowing method with spacing of 60 cm x 10 cm on ridges. The ten treatments were *viz.* Absolute control (water spray) at tillering (45 DAS) and flowering (60 DAS) stage (T_1), RDF (60:30:30 NPK kg ha^{-1}) (T_2), 50% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage (T_3), 50% RDF *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage (T_4), 75% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage (T_5), 75% RDF *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage (T_6), 50% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage (T_7), 50% RDF *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage. (T_8), 75% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage (T_9) and 75% RDF *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage (T_{10}). For the nutrient application of crop Urea, SSP and MOP fertilizers were used while for the foliar spraying water-soluble fertilizers 19;19:19 and KNO_3 (potassium nitrate) were used. The yield observations and nutrient uptake studies were recorded at harvest.

Observation determination: For yield attributes length of all fingers from five observation plants was measured with the help of scale and it was divided by total number of earheads. Same procedure was followed for weight of earhead. For test weight 1000 grains were counted, and their collective weight was measured in grams. For grain yield the air-dried grain weight for each treatment was measured and then converted to a per hectare basis. The dried weight of straw from net plot was measured, and then straw yield was calculated on a per-hectare basis. The observational plants collected from each treatment plot after harvesting were used for chemical analysis. For nitrogen Micro-Kjeldahl method (Parkinson and Allen 1975) [11], for Phosphorus Vanadomolybdate yellow colour method in nitric acid system (Jackson, 1973) [8] for Potassium Flame photometer (Jackson, 1967) [7] was used.

Nitrogen (N) content estimation: The powdered 0.5 g plant sample was digested with concentrated sulphuric acid and digestion mixture ($CuSO_4$ + K_2SO_4 + selenium powder). The digest was transferred to the micro Kjeldhal distillation flask and the ammonia liberated was distilled in presence of alkali collected in 2 percent boric acid and the distillate was titrated against standard acid (Parkinson and Allen,1975) [11],

Phosphorous (P) content estimation: The phosphorus in plant sample was determined by Vanado molybdateoposphoric yellow colour method (Jackson, 1973) [8].

Potassium (K) content estimation: The potassium content in the digested samples was determined by flame photometer after making appropriate dilution (Jackson, 1973) [8].

Uptake studies: The uptake of nitrogen, phosphorus and potassium (kg ha^{-1}) was worked out by multiplying the percentage of these nutrients in grain, straw with the corresponding yields of the respective constituent.

$$\text{Nutrient uptake (kg ha}^{-1}\text{)} = \frac{\text{Nutrient conc. (\%) x Wt. of dry matter (kg ha}^{-1}\text{)}}{100}$$

Statistical analysis: The statistical analysis of Randomised Block Design with 3 replications, and 10 treatments was done by standard procedures suggested by Panse and Sukhatme (1967) [10].

Results and Discussions

Effect of foliar sprays water-soluble fertilizers on yield of summer finger millet as influenced by the application of different treatments

The different treatments of foliar spray showed significant differences with respect to yield and nutrient uptake among them. Data regarding yield is presented in Table 1 and depicted in Fig. 2. The treatment RDF (60:30:30 NPK kg ha^{-1}) showed the highest grain yield (33.85 q ha^{-1}) and straw yield (44.68 q ha^{-1}) of finger millet over all the treatments while among the different foliar treatments the application of 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage showed the highest grain yield (32.81 q ha^{-1}) and straw yield (43.50 q ha^{-1}).

The treatments in the next order were 75% RDF *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 75% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 75% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage. The lowest results were shown by the treatment absolute control (water spray) at tillering (45 DAS) and flowering (60 DAS) stage.

This might be due to the fact that the full recommended dose of fertilizers (RDF) provides a more balanced and sufficient supply of nutrients, which promotes better growth and development of the plant. The foliar fertilization not only enhances N, P and K content of plant but also carbon balance of the plant resulting in increased yields. (Gupta, 1988) [6]. It has been noted that, foliar application of water-soluble fertilizers shows instant uptake of nutrients by the plants resulting in significant and quick improvement in crop growth. Further the growth parameters *viz.* plant height, number of tillers, dry matter accumulation and leaf area were noted higher values in these treatments which ultimately had influenced the yield attributes like number of fingers, length of finger, weight of earhead and the test weight and consequently higher grain and straw yield. The findings are in conformity with those reported by Patil *et al.*, (2015) [12], Bulbule *et al.*, (2018) [4], Reddy *et al.* (2018) [14].

Effect of foliar sprays water-soluble fertilizers on nutrient uptake of summer finger millet as influenced by the application of different treatments

The data regarding the uptake of nitrogen, phosphorous and potassium by grain and straw of summer ginger millet and their total nutrient uptake is shown in Table 2 and depicted in Fig. 2.

The higher uptake of nitrogen in grain was noted with RDF (60:30:30 NPK kg ha^{-1}) (T_2) (52.18 kg ha^{-1}) which was closely followed by 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage (50.26 kg ha^{-1}) and 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage (46.62 kg ha^{-1}) while no significant differences were observed between among them and were statistically on par with each other. The treatments in the next order were 75% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 75% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage. The lowest results were shown by the treatment absolute control (water spray) at tillering (45 DAS) and flowering (60 DAS) stage (28.97 kg ha^{-1}). Similar trend was observed in case of straw.

For phosphorous the treatment RDF (60:30:30 NPK kg ha^{-1}) (20.66 kg ha^{-1}), 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage (19.37 kg ha^{-1}) noted higher phosphorus uptake in grains over remaining treatments while were on par with each other. The treatments in the next order were 75% RDF *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 75% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 75% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage and 50% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage. The lowest results were shown by the treatment absolute control (water spray) at tillering (45 DAS) and flowering (60 DAS) stage (10.57 kg ha^{-1}). Similar trend was observed in case of straw.

For potassium the higher uptake in grain was noted with application of RDF (60:30:30 NPK kg ha^{-1}) (54.20 kg ha^{-1}), 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage (51.91 kg ha^{-1}) and 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage (47.79 kg ha^{-1}) in that order while no significant differences were observed between among them and were statistically on par with each other. The treatments in the next order were 75% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 75% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage. The lowest results were shown by the treatment absolute control (water spray) at tillering (45 DAS) and flowering (60 DAS) stage (29.35 kg ha^{-1}). Similar trend was observed in case of straw.

The higher uptake in grain and straw is might be due to higher grain yield as well as efficient growth and yield attributing parameters noted in these treatments. Also balanced fertilization applied in the treatments might accounted for the higher recorded values, as it has fostered favourable crop growth and positively affected microbial activity. These results are in accordance with Mallesha (2013) [9], Rani *et al.*, (2017) [13], Bulbule *et al.*, (2018) [4], Sharifi *et al.*, (2018) [16] and Senthilkumar and Gokul (2020) [15].

The mean total nitrogen uptake was higher in case of treatment (60:30:30 NPK kg ha^{-1}) (T_2) (80.80 kg ha^{-1}) however it was at par with the (77.68 kg ha^{-1}) and followed by rest of the treatments in the order of 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 75% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage,75% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, absolute control (water spray) at tillering (45 DAS) and flowering (60 DAS) stage.

The highest mean total phosphorus uptake was significantly observed in the treatment (60:30:30 NPK kg ha^{-1}) (34.06 kg ha^{-1}) and 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and lowering (60 DAS) stage (31.98 kg ha^{-1}) and they were on par with each other. It was followed by rest of the treatments in the order of 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 75% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage (T_5), 75% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage (T_9), 50% RDF *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, absolute control (water spray) at tillering (45 DAS) and flowering (60 DAS) stage.

In case of potassium the treatment RDF (60:30:30 NPK kg ha^{-1}) (83.68 kg ha^{-1}) significantly recorded the highest mean total uptake and equally comparable with 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and lowering (60 DAS) stage (80.21 kg ha^{-1}). It was followed by rest of the treatments in the order of 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 75% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 75% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage,50% RDF *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage, 50% RDF *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage, absolute control (water spray) at tillering (45 DAS) and flowering (60 DAS) stage.

Table 1: Mean grain, straw yield and Harvest Index of summer finger millet as influenced by various treatments

Treatment details	Grain yield (q ha^{-1})	Straw yield (q ha^{-1})	Harvest Index (%)
T_1: Absolute control (water spray) at tillering (45 DAS) and flowering (60 DAS) stage	19.25	24.06	44.44
T_2: RDF (60:30:30 NPK kg ha^{-1})	33.85	44.68	43.10
T_3: 50% RDF (30:15:15 NPK kg ha^{-1}) *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage	23.22	29.72	43.86
T_4: 50% RDF (30:15:15 NPK kg ha^{-1}) *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage	27.70	35.18	44.05
T_5: 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage	29.18	36.85	44.19
T_6: 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage	32.81	43.50	43.00
T_7: 50% RDF (30:15:15 NPK kg ha^{-1}) *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage	21.80	27.90	43.86
T_8: 50% RDF (30:15:15 NPK kg ha^{-1}) *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage	25.90	32.63	44.25
T_9: 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage	28.67	36.41	44.05
T_{10}: 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage	30.64	39.53	43.67
S.Em. ±	0.85	1.05	-
LSD (P = 0.05)	2.53	3.12	-
General mean	27.30	35.04	43.85

T_1: Absolute Control

T_2: 100% RDF (60:30:30 NPK kg ha^{-1})

T_6: 75% RDF *fb* 2% spray of 19:19:19 at 45 and 60 DAS

T_{10}: 75% RDF *fb* 2% spray of KNO_3 at 45 and 60 DAS

T_5: 75% RDF *fb* 1% spray of 19:19:19 at 45 and 60 DAS

T_9: 75% RDF *fb* 1% spray of KNO_3 at 45 and 60 DAS

T_4: 50% RDF *fb* 2% spray of 19:19:19 at 45 and 60 DAS

T_8: 50% RDF *fb* 2% spray of KNO_3 at 45 and 60 DAS

T_3: 50% RDF *fb* 1% spray of 19:19:19 at 45 and 60 DAS

Fig 1: Photo plates of finger millets affected by different treatments

Table 2: Mean nitrogen, phosphorus and potassium uptake (kg ha^{-1}) of summer finger millet as influenced by different treatments

Treatments	Mean nutrient uptake by crop (kg ha^{-1})								
	Nitrogen uptake (kg ha^{-1})			Phosphorus uptake (kg ha^{-1})			Potassium uptake (kg ha^{-1})		
	Grain	Straw	Total	Grain	Straw	Total	Grain	Straw	Total
T_1: Absolute control (water spray) at tillering (45 DAS) and flowering (60 DAS) stage	28.97	13.70	42.67	10.57	6.24	16.81	29.35	14.48	43.84
T_2: RDF (60:30:30 NPK kg ha^{-1})	52.18	28.62	80.80	20.66	13.40	34.06	54.20	29.48	83.68
T_3: 50% RDF (30:15:15 NPK kg ha^{-1}) *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage	35.15	17.84	52.99	13.02	8.03	21.05	35.63	18.16	53.78
T_4: 50% RDF (30:15:15 NPK kg ha^{-1}) *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage	42.15	21.48	63.63	15.77	9.85	25.62	42.65	21.49	64.14
T_5: 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 1% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage	44.41	22.87	67.28	17.24	10.71	27.94	45.28	23.25	68.53
T_6: 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage	50.26	27.42	77.68	19.37	12.61	31.98	51.91	28.29	80.21
T_7: 50% RDF (30:15:15 NPK kg ha^{-1}) *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage	32.75	16.17	48.92	11.97	7.54	19.52	33.11	16.73	49.84
T_8: 50% RDF (30:15:15 NPK kg ha^{-1}) *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage	39.12	19.54	58.67	14.51	9.14	23.65	39.65	19.93	59.58
T_9: 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 1% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage	43.66	22.23	65.89	16.66	10.21	26.88	44.39	22.55	66.95
T_{10}: 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of KNO_3 at tillering (45 DAS) and flowering (60 DAS) stage	46.62	24.46	71.09	18.10	11.46	29.56	47.79	25.28	73.07
S.Em. ±	2.30	0.91	3.03	0.74	0.44	1.07	1.99	0.95	2.82
LSD (P = 0.05)	6.85	2.71	8.99	2.20	1.30	3.17	5.93	2.84	8.38
General mean	41.53	21.43	62.96	15.79	9.92	25.71	42.40	21.96	64.36

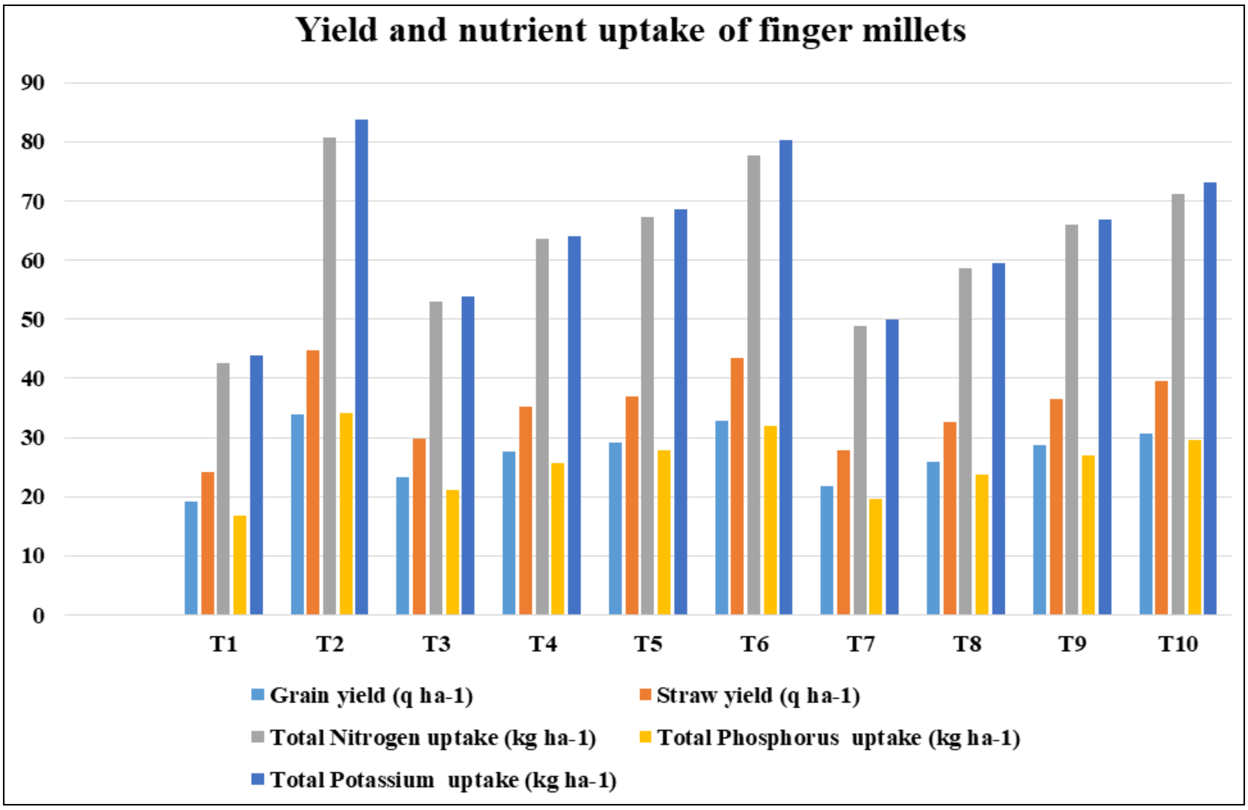

Fig 2: Yield and nutrient uptake of finger millets affected by different treatments

Conclusion

The yield and nutrient uptake of summer finger millet were significantly influenced by application different treatments. The treatment RDF (60:30:30 NPK kg ha^{-1}) recorded the highest values for yield and nutrient uptake of summer finger millet while among the different foliar sprays the application of 75% RDF (45:23:23 NPK kg ha^{-1}) *fb* 2% foliar spray of 19:19:19 at tillering (45 DAS) and flowering (60 DAS) stage recorded the highest values for yield and nutrient uptake of summer finger millet. The lowest values were observed with the treatment absolute control (water spray) at tillering (45 DAS) and flowering (60 DAS) stage.

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