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Effect of graded levels of nitrogen and foliar feeding of nutrients on performance of rice fallow finger millet [*Eleusine coracana* (L.)]

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Abstract
A field experiment was carried out during *rabi*, 2018–19 on a sandy loamy soil at the Agricultural College Farm, Naira to study the effect of nitrogen levels and foliar sprays on the growth, yield attributes and yield of finger millet. The experiment was laid out in Split plot design with four graded levels of nitrogen levels as main plot treatments and five foliar sprayings as sub plot treatments. The results revealed that the highest plant height, number of tillers plant^{-1}, days to 50 per cent flowering, days to maturity, weed count, weed dry weight, number of ears m^{-2}, earhead weight, grain yield (2657 kg ha^{-1}), straw yield and harvest index were registered with application of N @ 120 kg ha^{-1} among graded levels, application of 1% 19:19:19 at tillering *fb* 1% KNO_3 at panicle initiation among the foliar sprays and by their interaction effect. Hence, it can be concluded that application of N @ 120 kg N ha^{-1} and foliar feeding of 1% 19:19:19 at tillering *fb* 1% KNO_3 at panicle initiation are required for reaping higher yield in rice fallow finger millet.

Keywords: Nitrogen levels, foliar sprays, growth and yield of rice fallow finger millet

Introduction
In north coastal zone of A.P. a prospective situation for finger millet (*Eleusine coracana* L.), is emerged under ricefallows, because of it's drought tolerance with highest use efficiency of water especially in water scarce situations and flexibility in time of sowing as a fallow crop after *kharif* rice.

Rice fallow finger millet has many economic and environmental benefits over conventional finger millet, such as less labour requirement, irrigation, fertilizer needs and increased soil organic carbon content with reduced cost of production. Among various nutrients, nitrogen is inevitable and becoming increasingly important for assessing economic and environmental validity of a cropping system and establishment of its precise requirement is highly imperative for reaping higher yields. As rice fallow finger millet is grown exclusively on residual fertility without application of P and K fertilizers and micro nutrients, foliar nutrition assumes greater importance with a scope to supplement a portion of crop nutrition. Therefore, a study was undertaken to establish the effect of graded levels of nitrogen and foliar feeding of nutrients on performance of rice fallow finger millet.

Material and Methods
A field experiment was carried out during *rabi*, 2018–19 at the Agricultural College Farm, Naira which is geographically situated at an altitude of 27 m above mean sea level, 83.84º E longitudes and 18.24º N latitude in the North Coastal Agro climatic Zone of Andhra Pradesh. The soil of the experimental site was sandy loam in texture, slightly alkaline in nature, low in organic carbon (0.35) and available nitrogen (240 kg ha^{-1}), medium in available phosphorus (54 kg ha^{-1}) and available potassium (220 kg ha^{-1}). The experiment was laid out in a split plot design, replicated thrice with four nitrogen levels *viz.*, 60 kg N ha^{-1} (N_1), 80 kg N ha^{-1} (N_2), 100 kg N ha^{-1} (N_3) and 120 kg N ha^{-1} (N_4) assigned to main plot and five foliar feeding practices *viz.*, foliar application of 1% KNO_3 twice at tillering and panicle initiation stages (F_1), foliar application of 1% 19:19:19 twice at tillering and panicle initiation stages (F_2), foliar application of 1% 19:19:19 at tillering *fb* 1% KNO_3 at panicle initiation stages (F_3), foliar application 0.2% formula 4 twice at tillering and panicle initiation stages (F_4) and foliar application of 1% 19:19:19 at tillering *fb* 0.2% formula 4 at panicle initiation stages (F_5) assigned to sub plots.

Srichaitanya chose as the test variety. The seeds were soaked in water over night before sowing. Healthy and viable pregerminated seeds with 93% germination were broadcasted uniformly on 21th December, 2018, using the seed rate of 10 kg ha^{-1}. As it is the fallow crop grown on residual soil fertility, no manure or fertilizer was applied except N, which was applied as per the main plot treatments. Foliar application of 1% KNO_3, 1% 19-19-19 and 0.2% formula 4 were done twice at tillering and panicle initiation stages as per the sub plot treatments. To maintain optimum plant population, gap filling was done at 15 DAS and thinning was done at 20 DAS. Two hand weedings at fortnightly intervals were carried out starting from 20 DAS to keep the plots free from weeds. The crop was grown on residual soil moisture up to 30 DAS and thereafter three irrigations were given, first at 30 DAS along with the first top dressing of nitrogen (urea), second irrigation at flowering stage and third at grain filling stages.

The data on the highest plant height, number of tillers $plant^{-1}$, days to 50 per cent flowering, days to maturity, weed count, weed dry weight, number of ears m^{-2}, earhead weight, grain yield, straw yield and harvest index were recorded as per standard procedures. Data were analyzed using ANOVA and the significance was tested by Fisher's least significance difference (p=0.05).

Effect on growth parameters

Plant height & Number of tillers $plant^{-1}$

Regards to levels of nitrogen, statistically traceable difference was found with respect to plant height and number of tillers $plant^{-1}$ recorded at 30, 60 DAS and maturity. The highest values were observed in the plots which received the highest level of nitrogen (120 kg N ha^{-1}) at all the three stages of crop growth and was found to be on par with application of100 kg N ha^{-1}. The lower values were noticed with application of nitrogen @ 60 kg ha^{-1} and found inferior to rest of the levels of nitrogen tried. The higher plant height and number of tillers $plant^{-1}$ could be attributed to the fact that higher levels of nitrogen might have accelerated the synthesis of more chlorophyll and amino acids which is useful for the process of cell division, coupled with cell enlargement resulting in vertical increase in the culm length, and development of auxiliary buds from which tillers are emerge. These findings are in corroborations with those reported by Ramyasri *et al.* (2019) [11], Pradhan *et al.* (2018) [1], Vijayamehantesh *et al.* (2016), Bhomte *et al*. (2016) [4], Bekele *et al*. (2016) [6] and Tan *et al*. (2016) [10] in case of foxtail millet and finger millet respectively.

Difference in the plant height and number of tillers $plant^{-1}$ with foliar sprays of finger millet measured at 30DAS was found to be non significant. At 60 DAS and at maturity, significantly higher values were noticed with foliar application of 1% 19:19:19 at tillering *fb* 1% KNO_3 at panicle initiation stages which was found in parity with 1% 19:19:19 twice at tillering and panicle initiation stages and 1% KNO_3 twice at tillering and panicle initiation stages. 1% KNO_3 twice at tillering and panicle initiation stages also comparable with 1% 19:19:19 at tillering *fb* 0.2% formula 4 at panicle initiation stages. Significantly lowest values of finger millet was recorded with application of 0.2% formula 4 twice at tillering and panicle initiation stages and found on par with 1% 19:19:19 at tillering *fb* 0.2% formula 4 at panicle initiation stages. This might be due to favorable effects of foliar spray on plant stature as results of higher cell elongation, cell enlargement and more chlorophyll synthesis metabolic processes might have favoured in promoting plant height number of tillers $plant^{-1}$. Similar results were also reported by Reddy *et al.* (2018) [13] in finger millet.

With regard to interaction effect of different nitrogen levels and foliar feeding of nutrients at maturity on plant height and number of tillers $plant^{-1}$ shows that the highest plant height and number of tillers $plant^{-1}$ was noticed with 120 kg N ha^{-1} at foliar application of 1% 19:19:19 at tillering *fb* 1% KNO_3 at panicle initiation stages which was however, found in parity with foliar application of 1% 19:19:19 or 1% KNO_3 twice at tillering and panicle initiation stages at the same level of N and 100 kg N ha^{-1} application. Significantly inferior values for plant height were observed due to application of 60 kg N ha^{-1} along with 0.2% formula 4 twice at tillering and panicle initiation stages, foliar application of 1% 19:19:19 at tillering *fb* 0.2% formula 4 at panicle initiation and 1% KNO_3 twice at tillering and panicle initiation stages at the same level of nitrogen applied.

Days to 50 per cent flowering and Days to maturity

Data pertaining to days to 50 per cent flowering and maturity of finger millet to graded levels of nitrogen application revealed that days to 50 per cent flowering and maturity did not varied significantly with incremental doses of nitrogen and foliar application of nutrients as well as their interaction effect.

Weed count & Weed dry weight

At both 30 DAS and 60 DAS the maximum number of weeds and weed dry weight were noticed with the application of nitrogen 120 kg ha^{-1} followed by 100 kg ha^{-1}. The minimum number of weeds was recorded with application of nitrogen 60 kg ha^{-1}.

As regards to effect of foliar sprays nutrients on finger millet, similar weed counts noticed at 30 DAS, whereas at 60 DAS, significant disparities were noticed. At 60 DAS, maximum number of weeds were registered with the application of 0.2% formula 4 twice at tillering and panicle initiation stages and found on par with 1% 19:19:19 at tillering *fb* 0.2% formula 4 at panicle initiation stages. Significantly lowest number of weeds was recorded with the application of 1% 19:19:19 at tillering *fb* 1% KNO_3 at panicle initiation stages which was however comparable with 1% 19:19:19 twice at tillering and panicle initiation stages.

Higher weed count and weed dry weight registered due to incremental dose of nitrogen from 60 kg to120 kg ha^{-1} because of superiority of weeds over crop plants in getting resources. Whereas the highest weed counts and dry weight was noticed with 0.2% formula 4 twice at tillering and panicle initiation stages due to less vegetative growth of plants posed less competition to weeds in this treatment compared to the other foliar feeding treatments.

Number of ears m^{-2} & Earhead weight

Number of ears m^{-2} and earhead weight was found to be maximum with 120 kg N ha^{-1} which was found in parity with 100 kg N ha^{-1} and 80 kg N ha^{-1} while, it was minimum with 60 kg N ha^{-1}. This might be due to the availability of adequate amounts of nitrogen at the eco-rhizosphere which in turn resulted in higher accumulation of photosynthetic assimilates as reflected in greater accrual of drymatter and results in increased translocation of these resources from source to sink resulting in enhanced yield parameters. Ramyasri *et al*. (2019) [11], Gawade *et al*. (2013) [2, 5], Ahiwale *et al*. (2013) [2] and

Muneendra *et al.* (2003) [8] in case of foxtail millet, little millet, proso millet, finger millet also reported similar findings.

As regards to foliar application of nutrients, number of ears m^{-2} and earhead weight was significantly higher with 1% 19:19:19 at tillering *fb* 1% KNO_3 at panicle initiation stages which was however, recorded parity with 1% 19:19:19 twice at tillering and panicle initiation stages. The lowest number of ears m^{-2} was associated with 1% 19-19-19 at tillering *fb* 0.2% formula 4 at panicle initiation stage. This could be attributed to the fact that foliar applied nutrients enter the cell rapidly and fulfill the nutrient demand and results in better growth structure there by yield formation. Similar views were also expressed by Reddy *et al.* (2018) [13] in finger millet.

With regard to interaction effect of application of nitrogen levels and foliar feeding of nutrients on number of ears m^{-2}, earhead weight, the highest number of ears m^{-2} and earhead weight was noticed with 120 kg N ha^{-1} at 1% 19:19:19 at tillering *fb* 1% KNO_3 at panicle initiation stages which was however, observed on par with 1% 19:19:19 or 1% KNO_3 twice at tillering and panicle initiation stages at the 120 kg and 100 kg ha^{-1} levels of nitrogen application. Significantly inferior values for number of ears m^{-2} were observed due to application of 60 kg N ha^{-1} at 0.2% formula 4 twice at tillering and panicle initiation stages which was however, found parity with foliar application of 1% 19:19:19 at tillering *fb* 0.2% formula 4 at panicle initiation stages and 1% KNO_3 twice at tillering and panicle initiation stages at the same level of nitrogen applied and also with 80 kg N ha^{-1} at 0.2% formula 4 twice at tillering and panicle initiation stages.

Effect on Grain and straw yield

Application of nitrogen 120 kg ha^{-1} recorded the highest grain yield and straw yield which was in parity with application of N@100 kg ha^{-1} and both the treatments were significantly superior to the other nitrogen levels. Application of N @ 60 kg ha^{-1} was recorded significantly lower grain yield among all the nitrogen levels. There was an increase in the grain yield by 27.9% due to application of the highest dose (120 kg ha^{-1}) of nitrogen over application of lower dose of nitrogen i.e., 60 kg ha^{-1}. The increase in grain yield with 100 kg N ha^{-1} and 80 kg N ha^{-1} over 60 kg ha^{-1} was 21.0% and 10.7% respectively, indicating the clear response of finger millet to incremental levels of nitrogen. This could be attributed mainly to the augmented growth and yield structure leads to increase in grain yield. Nitrogen being a basic constituent of protoplasm and chloroplast stimulate meristematic growth of a plant. Increase in nitrogen levels ensure continuous supply of adequate nitrogen to the crop resulting in to increased N uptake might have assisted in greater photosynthesis and efficient translocation of photosynthates from source to sink. These findings are in corroborations with those reported by Ramyasri *et al.* (2019) [11], Charate *et al.* (2017) [14], Sumalata *et al*. (2017) [15], Ullasa *et al*. (2017) [16], Ahiwale *et al.* (2013) [2] and Yadav *et al.* (2010) [12] in case of foxtail millet, little millet and finger millet, respectively.

With regard to foliar sprays tested, the highest grain yield and straw yield of finger millet was registered with application of 1% 19-19-19 at tillering *fb* 1% KNO_3 at panicle initiation stage which was comparable with 1% 19-19-19 or 1% KNO_3 twice at tillering and panicle initiation stage. Significantly lowest grain yield of finger millet was recorded with application of 0.2% formula 4 twice at tillering and panicle initiation stages. The percentage increase in the grain yield due to foliar application of the 1% 19-19-19 at tillering *fb* 1% KNO_3 at panicle initiation stage was 10.8% over foliar feeding with 0.2% formula 4 twice at tillering and panicle initiation stages. The increase in grain yield with 1% 19-19-19 and KNO_3 over 0.2% formula 4 was 9.09% and 7.58%, respectively, indicating the finger millet response to foliar feeding of nutrients. The superiority of 1% 19-19-19 and KNO_3 either in combination or individually in terms of yield can be attributed due to highest number of earheads m^{-2}, earhead weight and also improved growth parameters (plant height, tillers $plant^{-1}$) as compared to other foliar sprays. This might be due to greater absorption, assimilation and translocation of nutrients for increased photosynthesis and increased production of growth and its efficient translocation to the economic parts ultimately reflected on the final yield. These findings were in agreement with Reddy *et al.* (2018) [13] and Patil *et al*. (2018) [13] in finger millet.

As regards the interaction effect of varied levels of nitrogen application and foliar feeding of nutrients on grain yield and straw yield, the highest grain and straw yield was registered with application of 120 kg N ha^{-1} along with foliar application of 1% 19:19:19 at tillering *fb* 1% KNO_3 at panicle initiation stages however it was comparable with other foliar feeding treatments at the same level of nitrogen application and also with application of 100 kg N ha^{-1} along with 1% 19:19:19 at tillering *fb* 1% KNO_3 at panicle initiation stages, 1% 19:19:19 twice at tillering and panicle initiation stages and 1% KNO_3 twice at tillering and panicle initiation stages. The lowest grain yield was noticed with 60 kg N ha^{-1} at 0.2% formula 4 twice at tillering and panicle initiation stages and other foliar feeding 0.2% formula 4 twice at tillering and panicle initiation stages. The increase in the percentage of grain yield was 30.9% due to application of the highest dose of nitrogen 120 kg ha^{-1} at 1% 19-19-19 at tillering *fb* 1% KNO_3 at panicle initiation stage over the application of lower dose of nitrogen 60 kg ha^{-1} at 0.2% formula 4 twice at tillering and panicle initiation stages.

Higher grain and straw yield associated with the application of nitrogen 120 kg N ha^{-1} along with foliar application of 1% 19:19:19 at tillering *fb* 1% KNO_3 at panicle initiation stages might be attributed to better availability and uptake of nitrogen, phosphorus and potassium which in turn lead to efficient metabolism in plant might have translated in to significantly higher grain and straw yield. These results were in agreement with those reported by Ramyasri *et al.* (2019) [11], Pradhan *et al.* (2018) [1], Ullasa *et al*. (2017) [16], Munirathnam and Kumar (2015) [19] in case of foxtail millet and finger millet respectively.

Harvest index

The highest harvest index was observed with the application of 120 kg N ha^{-1} and with regard to foliar sprays, the highest harvest index was recorded due to application of 1% 19:19:19 at tillering *fb* 1% KNO_3 at panicle initiation stages. This can be attributed to better availability and uptake of nitrogen, phosphorus and potassium which inturn lead to efficient metabolism might have translated in to significantly higher grain and straw yield and inturn harvest index. These results were in agreement with those reported by Ramyasri *et al.* (2019) [11], Pradhan *et al.* (2018) [1], Ullasa *et al*. (2017) [16], Munirathnam and Kumar (2015) [19] in case of foxtail millet and finger millet respectively.

Table 1: Growth parameters of rice fallow finger millet at 30, 60 DAS and at maturity as influenced by nitrogen levels and foliar sprays.

Treatments	Plant height (cm)			Number of tillers pant^{-1}			Days to 50% flowering	Days to maturity	Weed count (no. m^{-2})		Weed dry weight (g m^{-2})	
	30	60	maturity	30	60	maturity			30	60	30	60
Nitrogen levels (kg ha^{-1})												
N_1:60	41.8	77.6	112.7	2.42	2.65	3.29	79.0	98.0	53.5	40.8	121.5	123.7
N_2:80	47.8	87.8	122.2	2.70	3.07	3.59	79.2	96.6	61.3	49.4	130.5	134.6
N_3:100	52.5	96.9	128.8	2.93	3.38	3.81	81.8	101.0	67.9	56.1	138.2	140.8
N_4:120	55.1	102.2	131.7	3.10	3.53	4.00	83.1	103.0	70.4	59.9	143.4	144.6
SEm (±)	0.6	2.1	1.9	0.10	0.05	0.07	1.4	1.6	1.2	1.0	1.8	2.1
CD (P=0.05)	2.3	7.4	6.9	0.19	0.17	0.24	NS	NS	4.3	3.6	6.3	7.6
CV (%)	5.1	8.9	6	7.2	5.9	7	6.8	6.1	7.4	7.7	5.2	6.1
Foliar sprays												
F_1: 1% KNO_3 twice at tillering and PI stages	48.6	91.8	124.2	2.79	3.18	3.70	80.7	100.3	64.0	51.3	134.1	137.0
F_2: 1% 19:19:19 twice at tillering and PI stages	49.3	93.1	125.6	2.74	3.27	3.74	81.4	101.0	64.5	50.8	134.6	135.5
F_3: 1% 19:19:19 twice at tillering fb 1% KNO_3 PI stage	49.4	94.4	126.7	2.81	3.24	3.79	82.5	102.0	62.8	47.7	132.9	130.0
F_4: 0.2% formula 4 twice at tillering and PI stages	49.4	87.5	120.6	2.74	3.01	3.50	79.4	99.0	63.1	54.9	133.2	139.6
F_5: 1% 19:19:19 twice at tillering fb 0.2% formula 4 PI stage	49.7	88.8	122.0	2.83	3.09	3.65	80.0	99.9	62.1	53.0	132.3	137.6
SEm (±)	1.1	1.4	0.9	0.04	0.05	0.03	1.19	0.88	1.2	1.04	1.9	2.0
CD (P=0.05)	NS	4.0	2.7	NS	0.14	0.10	NS	NS	NS	3.02	NS	5.8
CV (%)	8.1	5.2	3	5.0	5.1	3	5.1	3.0	6.8	7.0	5.0	5.1
Interaction												
CD (P=0.05)	NS	NS	S	NS	NS	S	NS	NS	NS	NS	NS	NS

Table 2: Interaction effect of graded levels of nitrogen and foliar feeding of nutrients on plant height (cm) at maturity

Treatments	Foliar feeding of nutrients					
	F_1	F_2	F_3	F_4	F_5	Mean
N_1: 60	110.2	115.9	116.0	107.7	113.7	112.7
N_2: 80	123.2	120.2	123.3	121.3	123.0	122.2
N_3: 100	130.4	132.5	132.7	122.9	125.0	128.7
N_4: 120	133.1	133.5	135.0	130.4	126.5	131.7
Mean	124.2	125.6	126.7	120.6	122.0	
	SEm±		CD (p = 0.05)		CV (%)	
Graded levels of nitrogen (N)	1.9		6.8		6	
Foliar feeding of nutrients (F)	0.9		2.7		3	
N*F	4.3		6.1			
F*N	2.6		8.4			

Table 3: Interaction effect of graded levels of nitrogen and foliar feeding of nutrients on number of tillers plant^{-1} at maturity.

Treatments	Foliar feeding of nutrients					
	F_1	F_2	F_3	F_4	F_5	Mean
N_1: 60	3.27	3.30	3.40	3.24	3.25	3.29
N_2: 80	3.63	3.70	3.72	3.33	3.57	3.59
N_3: 100	3.91	3.97	3.99	3.47	3.72	3.81
N_4: 120	4.02	4.03	4.04	3.94	4.00	4.00
Mean	3.70	3.74	3.79	3.50	3.65	
	SEm±		CD (p = 0.05)		CV (%)	
Graded levels of nitrogen (N)	0.07		0.24		7	
Foliar feeding of nutrients (F)	0.03		0.10		3	
N*F	0.15		0.22			
F*N	0.09		0.29			

Table 4: Yield attributes, yield and head rice recovery of rice as influenced by NDVI values of green seeker and nitrogen levels

Treatments	No. of ears m^{-2}	Earhead weight (g)	Grain Yield (kg ha^{-1})	Straw yield (kg ha^{-1})	Harvest Index (%)
Nitrogen levels (kg ha^{-1})					
N_1:60	82.3	5.19	2077	3110	39.97
N_2:80	90.1	6.09	2300	3366	40.55
N_3:100	95.6	6.83	2514	3616	40.96
N_4:120	97.8	7.11	2657	3721	41.65
SEm (±)	2.16	0.09	66.4	90.9	
CD (P=0.05)	7.64	0.30	234.2	320.7	

CV (%)	9.0	5.4	11	10	
Foliar sprays					
F_1: 1% KNO_3 twice at tillering and PI stages	93.1	6.33	2412	3479	40.80
F_2: 1% 19:19:19 twice at tillering and PI stages	95.0	6.39	2446	3527	40.85
F_3: 1% 19:19:19 twice at tillering fb 1% KNO_3 PI stage	96.1	6.42	2485	3551	41.11
F_4: 0.2% formula 4 twice at tillering and PI stages	84.0	6.14	2244	3312	40.32
F_5: 1% 19:19:19 twice at tillering fb 0.2% formula 4 PI stage	89.1	6.24	2348	3398	40.81
SEm (±)	0.80	0.03	31.3	27.5	
CD (P=0.05)	2.31	0.09	90.5	79.5	
CV (%)	3.0	2.0	5	3	
Interaction					
CD (P=0.05)	S	S	S	S	

Table 5: Interaction effect of graded levels of nitrogen and foliar feeding of nutrients on number of ears m^{-2}.

Treatments	**Foliar feeding of nutrients**					
	F_1	**F_2**	**F_3**	**F_4**	**F_5**	**Mean**
N_1: 60	81.2	84.7	85.8	77.9	81.9	82.3
N_2: 80	92.5	93.7	94.1	79.9	90.5	90.1
N_3: 100	98.2	100.7	101.2	86.2	91.7	95.6
N_4: 120	100.3	100.8	103.3	92.0	92.4	97.8
Mean	93.1	95.0	96.1	84.0	89.1	
	SEm±		CD (p = 0.05)		CV (%)	
Graded levels of nitrogen (N)	2.16		7.64		9.0	
Foliar feeding of nutrients (F)	0.80		2.31		3.0	
N*F	4.84		5.32			
F*N	2.59		8.65			

Table 6: Interaction effect of graded levels of nitrogen and foliar feeding of nutrients on earhead weight (g).

Treatments	**Foliar feeding of nutrients**					
	F_1	**F_2**	**F_3**	**F_4**	**F_5**	**Mean**
N_1: 60	5.18	5.19	5.24	5.15	5.17	5.19
N_2: 80	6.10	6.22	6.24	5.91	5.95	6.09
N_3: 100	6.95	6.99	7.01	6.46	6.76	6.83
N_4: 120	7.10	7.13	7.21	7.03	7.09	7.11
Mean	6.33	6.39	6.43	6.14	6.24	
	SEm±		CD (p = 0.05)		CV (%)	
Graded levels of nitrogen (N)	0.09		0.31		5.4	
Foliar feeding of nutrients (F)	0.03		0.10		2.0	
N*F	0.20		0.23			
F*N	0.10		0.36			

Table 7: Interaction effect of graded levels of nitrogen and foliar feeding of nutrients on number of fingers earhead^{-1}.

Treatments	**Foliar feeding of nutrients**					
	F_1	**F_2**	**F_3**	**F_4**	**F_5**	**Mean**
N_1: 60	4.73	4.74	4.77	4.71	4.72	4.73
N_2: 80	5.40	5.50	5.54	5.20	5.37	5.40
N_3: 100	6.04	6.10	6.14	5.63	5.84	5.95
N_4: 120	6.20	6.23	6.24	6.18	6.19	6.21
Mean	5.60	5.64	5.67	5.43	5.53	
	SEm±		CD (p = 0.05)		CV (%)	
Graded levels of nitrogen (N)	0.08		0.28		5.5	
Foliar feeding of nutrients (F)	0.03		0.10		2.0	
N*F	0.20		0.22			
F*N	0.10		0.3			

Table 8: Interaction effect of graded levels of nitrogen and foliar feeding of nutrients on grain yield (kg ha^{-1}).

Treatments	**Foliar feeding of nutrients**					
	F_1	**F_2**	**F_3**	**F_4**	**F_5**	**Mean**
N_1: 60	2,060	2,067	2,152	2,049	2,057	2,077
N_2: 80	2,334	2,384	2,428	2,084	2,269	2300
N_3: 100	2,606	2,660	2,676	2,206	2,419	2,514
N_4: 120	2,646	2,674	2,682	2,636	2,646	2,657
Mean	2,412	2,446	2,485	2,244	2,348	

	SEm±	CD (p = 0.05)	CV (%)
Graded levels of nitrogen (N)	66.4	234.2	11
Foliar feeding of nutrients (F)	31.3	90.5	5
N*F	148.4	204.2	
F*N	86.8	283.4	

Table 9: Interaction effect of graded levels of nitrogen and foliar feeding of nutrients on straw yield (kg ha^{-1}).

Treatments	Foliar feeding of nutrients					
	F_1	**F_2**	**F_3**	**F_4**	**F_5**	**Mean**
N_1: 60	3,092	3,124	3,150	3,088	3,097	3,110
N_2: 80	3,403	3,453	3,495	3,127	3,355	3,366
N_3: 100	3,705	3,759	3,773	3,382	3,461	3,616
N_4: 120	3,716	3,773	3,786	3,650	3,681	3,721
Mean	3,479	3,527	3,551	3,312	3,398	

	SEm±	CD (p = 0.05)	CV (%)
Graded levels of nitrogen (N)	90.9	320.7	10
Foliar feeding of nutrients (F)	27.5	79.5	3
N*F	203.3	185.9	
F*N	103.4	349.7	

Conclusion

Based on the above results and discussion, it can be concluded that N application @ 120 kg ha^{-1} and foliar feeding with 1% 19:19:19 at tillering *fb* 1% KNO_3 at panicle initiation stages was required for reaping higher, growth, yield parameters, grain and straw yield of rice fallow finger millet.

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