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Production of baby corn hybrid as influenced by Nitrogen and Phosphorus in *kharif* season

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Abstract
For evaluation the performance of nitrogen and phosphorus on yield of baby corn and quality parameters, a trial was taken at MMRS, AAU, Godhra in the period of *kharif* 2020, *kharif*-2021 and *kharif* 2022. The experiment was laid down by keeping spacing 45 x 20 cm by taking 03 levels of nitrogen (40, 60 and 80 kgN/ha), 02 levels of phosphorus (20 and 40 kg P_2O_5/ha) with four replications. The results indicated that 80 kg N/ha gave 5306 kg/ha and 1418 kg/ha baby corn yield with husk and without husk, respectively. While 40 kg Phosphorus gave 4920 kg/ha and 1369 kg/ha baby corn yield with husk and without husk, respectively. Eighty kg Nitrogen per hector gave 5.87% Total Soluble Solids and 4.57 mg/100 gm total carotenoids while Fourty kg phosphorus per hector gave more percentage of Total Soluble Solids (5.70%) and more carotenoids % (4.54 mg/100 gm). Out of all, N_3P_2 (Eighty kg nitrogen and Fourty kg phosphorus per hectare) presented more net return (Rs.1,62,745) with more Benefit Cost Ratio (7.09) than other treatments. Looking to these results, it is advised to the farmers growing baby corn in *kharif* season to apply 40 kilogram Nitrogen as well as 20 kilogram phosphorus per hectare.

Keywords: hybrid, nitrogen, single cross, phosphorus

Introduction
Baby corn is one of the dual-purpose crops as fresh and nutritive vegetable, dehusked tender unfertilized ears consuming fifteen to twenty % by personnel and other portion is utilized for nutritive fodder for cow and buffaloes. (Kumar *et al*. (2015) [6]. The area of corn in our country is about 9.38 m.ha. while the production is about 28.75 m. tons and yield is about 3065 kg/ha (Indiastat, 2017) [4]. However, it is also cultivated as specialty corns including baby corn. Being a maize as C_4 plant, it has a wonderful yield potential and returns well to all given inputs for crop growth. Due to non-adoption of proper precision agronomical cultivation methods like, nitrogen and phosphorus management, appropriate time of sowing and cultivar to be used for sowing. (Singh *et al*., 2010) [9]. Because of more expenses of agronomical practices and deterieoting factors, fruitfulness of economic feed in like fertilizers as well as phytosanitory chemicals the baby corn cultivation profitability is being extremely dropped.
Based on literature, maize is highly responsive to nitrogen. It is fact that the information found insufficient on effect of N and P_2O_5 on productivity of single cross baby corn hybrid. Maximum production of baby corn can be achieved through application chemical fertilizers but due to excessive use of it physical and chemical properties of soil may decline along with crop yield (Kumar *et al*., 2015) [6]. The requirement of inorganic fertilizers may be decreased due to its proper planning and soil health may be improved. This study was formulated to enhance the productivity of baby corn through proper management of the spacing and nutrient.

Materials and methods
Location and Basis of resources
During *kharif*-2020-22, the trial was taken at the MMRS, AAU, Godhra, Panchmahal, Gujarat. The soil was sandy loam. A single cross hybrid, GAYMH-1 was used to assess the effects of nutrient management for optimum yield and quality parameters.

Experimental design, data collection and statistical analysis
FRBD was used for this trail with six treatments and four replications. Three doses of Nitrogen *viz.*, N_1: 40 kg N/ha, N_2: 60 kg N/ha, N_3: 80 kg N/ha as main plots and two doses of Phosphorus like, P_1: 20 kg P_2O_5/ha, P_2: 40 kg P_2O_5/ha as sub-plots combinations were planned. The sowing distance was 60 x 20 cm with a row length of 4.6 meter and width of the

plot is 1.8 meter consisting of four rows. At 25 DAS and 45 DAS, two hand weeding carried out to keep field free from weeds. After 2-3 days emergence of silk, harvesting of baby corn was done. For the recording of observations, from each plot 5 plants were selected randomly excluding the border rows of for recording the observations for diverse characters. The data respective to various characters were statistically analyzed by the procedure of analysis of variance for FRBD stated. For significant 'F' test, critical difference (CD) was reported at 5 per cent probability level.

Results and discussion

Yield attributes

The results exhibited that treatment of nitrogen N_3 *i.e* eighty-kilogram nitrogen per hectare presented 5306 kilogram and 1418 kilogram per hectare yield with and without husk, respectively. Whereas treatment, of phosphorus *i.e* P_2 40 kg/ha exhibited higher baby corn productivity, 4920 kg/ha with husk and 1369 kg/ha without husk (Table-1). The application of different chemical fertilizer combinations was significantly influenced the yield relating traits like length of ear, girth of ear and yield of baby corn as well as fodder yield. (Table 1-3). These characters were found significant effect of application of various fertilizer treatments under study. Khaliq *et al*. (2004) [5] quoted the parallel results while study in maize. Various physiological growth of plant is also enhancing by the application of nitrogen which improve productive characters. The equivalent outcomes was also informed by Pal *et al*. (2017) [8] in maize.

From the results of kharif-2022, it was also found that nitrogen and phosphorus interaction effect was found significant. In addition, the treatment of nitrogen *i.e* N_3 80 kg /ha gave highest green fodder yield, 26925 kg/ha followed by the application of 60 kg Nitrogen/ha and yielded, 23620 kg/ha of green fodder. The application of phosphorus P_2 (40 kg/ha) revealed 24537 kg/ha green fodder yield. Yadav and Lourduraj (2006) [11] also noted the similar results in maize. From the results of *kharif*-2022, it was also depicted that the traits like ear length was significantly affected by the application of fertilizer treatments.

The nitrogen treatment N_3 (80 kg /ha) found higher Length (8.19 cm), while phosphorus treatment P_2 (40 kg /ha) showed 7.82 cm length of dehusked baby corn (Table-3). Subsequently, 60 kg of nitrogen per hectare give higher baby corn length (7.64 cm) including girth of ear also affecting by various fertilizer treatments combinations in 2020. The comparable outcomes was also mentioned by Anees *et al*., 2016 [1].

Quality parameters

Total Soluble Sugar (TSS) and carotenoid content were significantly controlled by the dose of different fertilizer treatments. The nitogen treatment N_3 *i.e* 80 kg/ha exhibited 5.87% Total Soluble Solids and 4.57 mg/100gm carotenoids. In addition, the effect of P_2O_5 significance on Total Soluble Solids and total carotenoids. P_2O_5 *i.e* 40 kg /ha) obtained higher 5.70% TSS and 4.54 mg/100 gm carotenoids (Table-4). The outcomes are in concurrence with the earlier finding of Okoroafor *et al*. (2013) [7] during their study in maize.

Economics

The economics results are shown in the table-5. It was depicted from the results that the application of the treatments N_3P_2 (Eighty kg nitogen per hectare + Fourty kilogram phosphorous per hectare) gained higher net profit, Rs.1, 62,745/- along with the high BCR: 7.09 across all the treatments. In view of soil health and suitable environment, the low cost of treatment N_1P_1 (Fourty kg nitogen per hectare + Twenty kilogram phosphorous per hectare) may be suitable to recommend.

Table 1: Effects of nitrogen and phosphorus on yield of baby corn in *kharif* 2020-22.

Treatments	Baby corn yield with husk (kg/ha)				Baby corn yield without husk (kg/ha)			
	2020	**2021**	**2022**	**Pooled**	**2020**	**2021**	**2022**	**Pooled**
N_1 (40)	4542	5613	4361	4838	1016	1757	1000	1257
N_2 (60)	4854	5731	4861	5148	1054	1859	1250	1387
N_3 (80)	4882	5871	5167	5306	1074	1910	1268	1418
S.Em ±	198	493	170	186	49	165	43	59
CD (P=0.05)			512				131	
P_1 (20)	4530	5665	4673	4956	1051	1800	1166	1339
P_2 (40)	4988	5812	4920	5240	1046	1884	1179	1369
S.Em ±	162	402	138	151	40	134	35	48
CD (P=0.05)								
N x P								
S.Em ±	280	697	240	263	69	233	61	83
CD (P=0.05)								
Year								
S.Em ±				186				59
CD (P=0.05)				530				168
N x Y								
S.Em ±				322				102
CD (P=0.05)								
P x Y								
S.Em ±				263				83
CD (P=0.05)								
N x P x Y								
S.Em ±				455				145
CD (P=0.05)								
CV%	11.8	16.3	10.3	12.8	13.2	10.6	16.3	13.3

Table 2: Effects of nitrogen and phosphorus on green fodder yield and plant stand at harvest during *kharif* 2020-22.

Treatments	Baby corn green fodder (kg/ha)			
	2020	**2021**	**2022**	**Pooled**
N_1 (40)	16333	19601	20342	18759
N_2 (60)	16713	19111	23620	19814
N_3 (80)	16287	19148	26925	20787
S.Em ±	715	463	845	1145
CD (P=0.05)			2547	
P_1 (20)	16487	19754	22722	19594
P_2 (40)	16401	19000	24537	19979
S.Em ±	584	378	690	326
CD (P=0.05)				
N x P				
S.Em ±	1011	655	1195	1112
CD (P=0.05)			3603*	
Year				
S.Em ±				400
CD (P=0.05)				1140
N x Y				
S.Em ±				693
CD (P=0.05)				1976
P x Y				
S.Em ±				565
CD (P=0.05)				
N x P x Y				
S.Em ±				980
CD (P=0.05)				2794
CV%	12.3	6.8	10.1	9.7

*significant at 5 % probability

Table 3: Effects of nitrogen and phosphorus on plant height and Babycorn length in *kharif* 2020-22.

Treatments	Length of Baby corn without husk (cm)				Girth of Baby corn without husk (cm)			
	2020	**2021**	**2022**	**Pooled**	**2020**	**2021**	**2022**	**Pooled**
N_1 (40)	8.55	6.64	7.08	7.42	4.50	3.15	3.71	3.78
N_2 (60)	8.56	6.66	7.64	7.62	4.50	3.20	3.93	3.88
N_3 (80)	8.73	7.00	8.19	7.97	5.11	3.36	4.13	4.20
S.Em ±	0.18	0.16	0.22	0.19	0.11	0.08	0.14	0.13
CD (P=0.05)			0.66		0.35			
P_1 (20)	8.61	6.64	7.45	7.56	4.74	3.26	3.84	3.94
P_2 (40)	8.62	6.85	7.82	7.76	4.67	3.22	4.00	3.96
S.Em ±	0.15	0.14	0.17	0.09	0.09	0.07	0.11	0.05
CD (P=0.05)								
N x P								
S.Em ±	0.26	0.24	0.31	0.15	0.16	0.07	0.19	0.09
CD (P=0.05)								
Year								
S.Em ±				0.11				0.07
CD (P=0.05)				0.31				0.19
N x Y								
S.Em ±				0.19				0.12
CD (P=0.05)				0.54				0.33
P x Y								
S.Em ±				0.15				0.09
CD (P=0.05)								
N x P x Y								
S.Em ±				0.27				0.16
CD (P=0.05)								
CV%	6.0	6.1	8.1	6.9	7.0	7.3	10.1	8.2

Table 4: Effects of nitrogen and phosphorus on moisture, Total soluble sugar and Total carbohydrates

Treatments	Total carotenoids (mg/100gm)	TSS (%)	Total carbohydrates (%)
N_1 (40)	4.28	5.26	9.01
N_2 (60)	4.54	5.66	9.69
N_3 (80)	4.57	5.87	9.86
S.Em ±	0.03	0.03	0.25
CD (P=0.05)	0.09	0.100	
P_1 (20)	4.38	5.50	9.28
P_2 (40)	4.54	5.70	9.76
S.Em ±	0.02	0.03	0.21
CD (P=0.05)	0.07	0.08	
N x P			
S.Em ±	0.04	0.04	0.36
CD (P=0.05)			
C.V. %	1.8	1.7	7.6

Table 5: Economics

Treatments	Main product (kg/ha)	By product (kg/ha)	Gross Realization (Rs/ha)	Total cost of cultivation (Rs/ha)	Net Realization (Rs/ha) (4-5)	BCR 4÷5
1	**2**	**3**	**4**	**5**	**6**	**7**
T_1 N_1P_1	1313	19302	169904	25242	144662	6.73
T_2 N_1P_2	1296	18216	166032	26295	139737	6.31
T_3 N_2P_1	1342	18938	172076	25452	146624	6.76
T_4 N_2P_2	1340	20691	175382	26505	148877	6.62
T_5 N_3P_1	1362	20543	177286	25662	151624	6.91
T_6 N_3P_2	1474	21030	189460	26715	162745	7.09

Main Product Rs.100/kg
By product Rs. 2.00/kg

Conclusions

The results indicated that the application of 80 kg Nitrogen/ha (50 % at the time of sowing and 50 % percent at after 30 days of sowing) gave more yield of baby corn across the years as well as in pooled analysis. These results seem to be at par with the Sixty-kilogram nitrogen per hectare. However, considering the low cost of cultivation as well as better profit, it is recommended to give Fourty kilogram nitrogen and Twenty kilogram phosphorus per hectare, from which 20 kg Nitrogen as well as 20 kg phosphorus given as basal, while remaining 20 kg Nitrogen apply after 30 days after sowing for obtaining optimum yield and higher net profit.

References

1. Anees M, Khan H, Ahmed Z. Role of amendments and micronutrients in maize (*Zea mays* L.) sown in calcareous soils. American Eurasian Journal of Agriculture Environmental Science. 2016;16:795-800.
2. Gomez K, Gomez A. Statistical procedures for Agricultural Research John Wiley and Sons, Inc, New York, USA; c1984.
3. Hekmat W, Abraham T. Yield and yield attributes of certified organic babycorn (*Zea mays* L.) as influenced by different sources of manures and intercropping with pulses. International Journal of Multidisciplinary Research and Development; c2016. p. 3.
4. Indiastat. Production and productivity of maize in India. (Online databases); c2017.
5. Khaliq T, Mahmood T, Kamal J, Masood A. Effectiveness of farmyard manure, poultry manure and nitrogen for corn (*Zea mays* L.) productivity. International Journal of Agricultural Biology; c2004. p. 2.
6. Kumar R, Bohra JS, Kumawat N, Singh AK. Fodder yield, nutrient Uptake and quality of baby corn (*Zea mays* L.) as influenced by NPKS and Zn fertilization. Research on Crops. 2015;16:243.
7. Okoroafor I, Okelola E, Edeh O, Nemehute V, Onu C, Nwaneri T, *et al*. Effect of Organic Manure on the Growth and Yield Performance of Maize in Ishiagu, Ebonyi State, Nigeria. IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS). 2013;5:28-31.
8. Pal B, Hirpara DS, Vora VD, Vekaria PD, Sutaria GS, Akbari KN. Effect of Nitrogen and phosphorous on yield and yield attributes of maize in southern Saurashtra, India. International Journal of Current Microbial Applied Science. 2017;6:1945-1949.
9. Singh MK, Singh RN, Singh SP, Yadav MK, Singh VK. Integrated nutrient management for higher yield, quality and profitability of babycorn (*Zea mays*). Indian Journal of Agronomy. 2010;2:100-104.
10. Sobhana V, Kumar A, Idnani LK, Singh I, Shiva D. Plant population and nutrient requirement for babycorn hybrids (*Zea mays*). Indian Journal of Agronomy; c2012. p. 57.
11. Yadav BK, Lourduraj AC. Effect of organic manure and Panchagavya spray on yield attributes, yield and economics of rice (*Oryza sativa* L.). Crop Research. 2006;31:1-5.