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EFFECT OF LEVEL AND TIME OF NITROGEN APPLICATION ON NUTRIENT CONTENT AND ECONOMICS IN BABY CORN (ZEA MAYS L)

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ABSTRACT

The baby corn yield and green fodder yield were significantly increased with increase in rates of nitrogen application up to 90 Kg N/ha. The difference between 60 kg N/ha and 40 kg N/ha were also significant. Nitrogen applied in 3 equal splits as 1/3 basal+ 1/3 knee height+ 1/3 pre tasseling Stages of baby corn resulted in significantly highest nutrient content of baby corn. The marketable baby corn yield and baby corn with husk yield is maximum at nitrogen level 90 kg/ha i.e., 1398.98 kg/ha and 4642.17 kg/ha respectively. At schedule S_4 (1/3 basal+ 1/3 knee height+ 1/3 pre tasseling Stages) the marketable baby corn yield and baby corn with husk yield is 1380.03 kg/ha and 4403.24 kg/ha which is also highest .Green fodder yield is maximum at 90 kg N/ha and S_4 i.e., 32.87 t/ha and 28.19 t/ha respectively. Regarding interaction of N content of baby corn, N content of green fodder, N uptake of baby corn and N uptake of green fodder it is maximum at 90 kg N/ha and S_4. Protein percentage of baby corn is highest at interaction of 90 kg N/ha and S_4 i.e, 19.03%. B: C was highest at 90 kg N/ha (5.32) and S_4 (5.18).

KEYWORDS: Nitrogen, Tassel, Knee Height, Basal, B: C

INTRODUCTION

Baby corn is an extremely easy crop to produce and is grown just like any other corn crop. It is not produced locally because hand labour is required for harvesting and processing, market prices are unknown, and consumers are unfamiliar with it as a fresh crop. However, locally produced fresh baby corn has several advantages such as it is superior in both taste and texture. Fresh baby corn has a crisp texture and a subtle, slightly sweet corn flavour. Although almost all the baby corn found in the United States is pickled or canned and imported from Asia, fresh baby corn is easy to grow in the Indian condition. Baby corn is no longer a delicacy or specialty food reserved for salad bars and Asian restaurants; it is a locally produced delicious treat to eat raw or cooked in many recipes. The tiny ears of baby corn are simply immature ears from regular-sized corn plants. Specialty varieties are available for baby corn production, but baby corn can also be harvested from many common corn varieties. Besides corn, its plant can also be used as fodder for cattle's, which is also nutritious. Since its a less duration crop, it can be utilised in many intercropping system.

MATERIALS METHODS

The field experiment "Effect of level and time of nitrogen application in baby corn (Zea mays L.) Was conducted in Uparjhar village of Bolangir district during kharif 2014 the experiment was conducted in Randomised Block Design

with three replications. Twelve treatment combinations comprising three nitrogen levels (40, 60 and 90 Kg N/ha) and four schedules of nitrogen application:

S_1 ½ basal+ ½ knee height

S_2 1/3 basal+ 2/3 knee height

S_3 ½ basal+ ¼ knee height+ ¼ pre tasseling

S_4 1/3 basal+ 1/3 knee height+ 1/3 pre tasseling

Net plot size was 7.5mX4.8m, gross plot size was 8mX5m, seeds sown at a depth of 5 cm with a spacing of 40x20 cm, variety selected was G-5414 F_1 hybrid of Syngenta company, seed rate was 25 kg/ha. Phosphorous and potassium was applied @ 60 kg and 40 kg per ha respectively. Gap filling and thinning operations was done at 7 DAS and 12 DAS respectively Intercultural operations was done at knee height stage (25 DAS) and pre tasseling stage (40 DAS).

RESULTS AND DISCUSSIONS

There was significant difference between marketable baby corn yield at 40 kg N/ha and 90 kg N/ha. Discarded baby corn yield was maximum at 40 kg N/ha (220.12 kg/ha) and minimum at 90 kg N/ha(133.78 kg/ha). Similarly, regarding schedule of nitrogen application marketable yield of baby corn is maximum at S_4 (1380.03 kg/ha) and minimum at S_1 (1020.47 kg/ha). Increased and balanced application of N in 3 equal splits improved the nutritional environment of the soil solution leading to higher availability of nutrients to plants. This led to increased physiological and biochemical reaction in plants which enhanced the mobilization of nutrients towards sink along with photosynthates of baby corn. Higher N might have favoured greater source sink relation at appropriate period of crop growth resulting higher baby corn and green fodder yield. There was highly significant positive correlation between N uptake and baby corn yield as well as with green fodder yield.

N applied @ 90 kg/ha with 3 equal splits resulted in maximum N uptake in baby corn (33.35 kg/ha). This is due to the increase dry matter yield of baby corn under this treatment, which in turn increase N uptake and protein yield. The build up of various growth and higher photosynthetic rate, lead to better uptake of nutrients by the crop The increase in N content and uptake due to increase rate of N application was also documented by Bar-Zur and Schaffer (2013) in baby corn.

The protein content of baby corn increase with increase in N levels up to 90 kg N/ha when applied in 3 splits (19.03 %). This might be attributed to maximum N content and extended benefit with congenial bio chemical relation at higher N levels as reported by Bar and Saadi (2010) in baby corn. In the present study also a positive and highly significant correlation was obtained between N uptake and protein content which confirms the earlier results of Chutkaew and Paroda (2014) and Galinat *et al* (2014) that N in corn plants is associated with the metabolism of protein.

Highest benefit cost ratio (B: C) was found at 90 kg N/ha (5.32) and also at S_4 (5.18). All the conditions were favourable at the two treatments which might have cumulatively increased the B: C. The result is in confirmation with Miles and Shaffner (2009).

Interaction Effect between Nitrogen Level and Time of its Split Application

Interaction effect between nitrogen level and time of its split application revealed significant response in increasing N content of baby corn and N uptake were also affected differently by interaction effect respectively. All these parameters were increased significantly with 90 kg N/ha applied in 3 equal splits. Similar findings was also reported by Peachey and William (2010) and Jackson *et al* (2013) in sweet corn crop.

CONCLUSIONS

Based on the above discussion, it can be concluded that for higher yield and monetary return with good quality baby corn production, N may be applied @ 90kg/ha in 3 equal split would be most viable practice.

Table 1: Effect of Level and Time of N Application on Baby Corn Yield (Kg/Ha)

N level(Kg/Ha) / Treatment	Baby Corn Yield With Husk	Marketable Baby Corn Yield	Discarded Baby Corn Yield
40	3465.23	921.90	220.12
60	4034.78	1058.45	179.87
90	4642.17	1398.98	133.78
SEM(±)	103.46	22.19	5.06
CD(P=0.05)	301.18	63.12	14.18
Time of N Application			
S1	3721.27	1020.47	190.05
S2	3967.41	1119.62	185.16
S3	4099.14	1257.48	172.07
S4	4403.24	1380.03	164.34
SEM(±)	118.03	25.76	5.78
CD(P=0.05)	350.01	73.41	17.18

Table 2: Effect of Level and Time of N Application on Green Fodder Yield (T/Ha) Baby Corn

Treatment	Green Fodder Yield
N Level(Kg/Ha)	
40	15.92
60	19.99
90	32.87
SEM(±)	1.02
CD(P=0.05)	3.08
Time of N Application	
S1	18.88
S2	22.27
S3	23.96
S4	28.19
SEM(±)	1.18
CD(P=0.05)	3.87

Table 3: Interaction Effect between Level and Time of N Application on N Content of Baby Corn

N Level(Kg/Ha) / Time of N Application	40	60	90
S_1	1.31	1.56	2.24
S_2	1.56	1.62	2.47
S_3	1.47	1.74	2.81

Table 3: Contd.,			
S_4	1.57	1.97	2.86
SEM	0.08		
CD(P=0.05)	0.24		

Table 4: Interaction between Level and Time of N Application on N Content in Green Fodder

N Level(Kg/Ha) / Time of N Application	40	60	90
S_1	0.56	0.86	0.82
S_2	0.54	0.75	0.99
S_3	0.73	0.99	1.15
S_4	0.82	0.87	1.65
SEM	0.11		
CD(P=0.05)	0.32		

Table 5: Interaction Effect between Levels and Time of N Application on N Uptake (Kg/Ha) Of Baby Corn

N Level(Kg/Ha) / Time of N Application	40	60	90
S_1	2.08	4.72	10.51
S_2	2.31	4.78	15.22
S_3	2.49	6.20	22.51
S_4	3.51	8.73	33.35
SEM	0.56		
CD(P=0.05)	1.69		

Table 6: Interaction Effect between Levels and Time of N Application on N Uptake of Green Fodder (Kg/Ha)

N Level(Kg/Ha) / Time of N Application	40	60	90
S_1	7.83	16.18	44.17
S_2	6.98	23.03	64.78
S_3	12.07	28.14	83.99
S_4	13.12	34.33	127.48
SEM	6.34		
CD(P=0.05)	18.56		

Table 7: Interaction Effect between Levels and Time of N Application on Protein Content (%) In Baby Corn

N Level(Kg/Ha) / Time of N Application	40	60	90
S_1	8.28	9.68	13.02
S_2	8.47	10.11	14.94
S_3	8.78	10.87	17.65
S_4	9.6	11.84	19.03
SEM(±)	0.48		
CD(P=0.05)	1.44		

Table 8: Effect of Levels and Time of N Application on Economics of Baby Corn Cultivation

Treatment	Gross Return(Rs/Ha)	Cost of Cultivation(Rs/Ha)	Net Return(Rs/Ha)	B: C
N Levels(Kg/Ha)				
40	55,314	14, 896	40,418	3.71
60	63,504	15,036	48,468	4.16
90	83,936	15, 764	68,172	5.32

Table 8: Contd.,				
SEM(±)	0.09			
CD(P=0.05)	0.29			
Time of N Application				
S1	61,228	14,509	46,719	4.22
S2	67,177	14,509	52,668	4.63
S3	75,449	15, 985	59,464	4.72
S4	82,802	15, 985	66,817	5.18
SEM(±)	0.19			
CD(P=0.05)	0.31			

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