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Original Article

Productivity, Economics and Quality of Baby Corn (*Zea mays L.*) Under Different Planting Geometries and Nutrient Management Practices in Indo- Gangetic Plains of India

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Abstract

Field experiment was conducted at Norman E. Borlaug Crop Research Center, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Udham Singh Nagar, Uttarakhand, India during *rabi* season of 2013-14 to study the effect of planting geometry and nutrient management on quality production of baby corn (*Zea mays* L.). The experimental site was sandy loam in texture with neutral pH (6.85), medium in organic carbon (0.625), in available nitrogen (269.28 kg/ha), available phosphorus (24.56 kg/ha) and available potassium (226.64 kg/ha). The experiment consisted of 12 treatments having planting geometry (45cm × 15cm, 45cm × 20cm, 60cm × 15cm and 60cm × 20cm) and 3 nutrient management practices (N_1:120:60:40, N_2:150:75:50 and N_3:180:90:60 :: N:P_20_5:K_20 kg/ha) was laid out in split plot design with three replication. The variety of baby corn was VL Baby Corn-1 developed from VPKAS, Almora. The crop was planted on 23-10-13 and 1st picking was taken on 4th January and last on 14th January 2014. The crop grown under 60cm × 15cm planting geometry had 22.32%, 9.65% and 14.98% higher cob yield than 45cm × 15cm, 45cm × 20cm and 60cm × 20cm planting geometries, respectively. Similarly baby corn yield was recorded significantly higher at 60cm × 15cm planting geometry with 1.9%, 17.3% and 24.7% higher than 45cm × 20cm, 60cm × 20cm and 45cm × 15cm planting geometries, respectively. Das *et al.* (2009) also reported similar results. The green fodder yield was recorded significantly higher under 45cm × 15 cm followed by 45cm × 20cm mainly because of higher plant population. The TSS and protein did not influence significant by planting geometries. Significantly higher net return and B:C ratio were also recorded at 60cm × 15cm followed by 45cm × 20cm planting geometry. application of 180 kg N+ 90 kg P_2O_5 + 60 kg K_2O gave significantly higher values of cob and baby corn yield, quality attributes and also economics. Application of 180:90:60 gave 1.5% and 9.5% higher baby corn yield than 150:75:50 and 120:60:40, respectively. It also gave higher TSS, protein content, net profit and also B:C ratio. It is therefore recommended that planting of baby corn at 60cm × 15cm geometry fertilized with 180kg N+90kg P_2O_5+60kg K_2O /ha would have higher productivity, profitability and better quality of baby corn production.

Keywords

Baby Corn; B:C Ratio; Economics; Protein; TSS; Quality.

Introduction

Baby corn is a dehusked maize ear, harvested within 2-3 days of silking stage but prior to fertilization (Pandey *et al*., 2002). Baby corn is very nutritive and its nutritional quality is at par or even superior to some of the seasonal vegetables. Das *et al.* (2009) reported that 100 g of baby corn contained 89.1% moisture, 0.2 g fat, 1.9 g protein, 8.2 mg carbohydrate, 0.06 g ash, 28.0 mg calcium, 86.0 mg phosphorus and 11.0 mg of ascorbic acid. It can be eaten raw as salad and in preparation of different recipes such as *chutney, pakora, mix vegetables, pickles, candy, murabba, kheer, halwa, raita, Chinese preparation*, etc. Besides proteins, vitamins and iron, it is one of the richest sources of phosphorus. It is a good source of fibrous protein and easy to digest. It is almost free from residual effects of pesticides.

Baby corn is a new specialty main in India, so the agronomy is yet to be standardized. Among the

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production factors, crop geometry and nutrient management are of immense significance and to be managed properly for higher baby corn production. The optimum crop geometry helps to harvest maximum solar radiation and utilize the soil resources effectively. Therefore, the present study was taken up with objective to study the effect of planting geometry and nutrient management on growth, yield and quality of baby corn in Tarain region of Uttarakhand.

Materials and Methods

Field experiment was conducted at Norman E. Borlaug Crop Research Center, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Udham Singh Nagar, Uttarakhand, India during *rabi* season of 2013-14 to study the effect of planting geometry and nutrient management on quality production of baby corn (*Zea mays* L.). The experimental site was sandy loam in texture with neutral pH (6.85), medium in organic carbon (0.625), in available nitrogen (269.28 kg/ha), available phosphorus (24.56 kg/ha) and available potassium (226.64 kg/ha). The experiment consisted of 12 treatments having planting geometry (45cm × 15cm, 45cm × 20cm, 60cm × 15cm and 60cm × 20cm) and 3 nutrient management practices (N_1:120:60:40, N_2:150:75:50 and N_3:180:90:60 :: N:P_20_5:K_20 kg/ha) was laid out in split plot design with three replication. The variety of baby corn was VL Baby Corn-1 developed from VPKAS, Almora. The crop was planted on 23-10-13 and 1st picking was taken on 4th January and last on 14th January 2014.

Results and Discussion

The baby cob and corn yield, green fodder yield, total soluble sugar (TSS), net profit and B:C ratio were influenced significantly by planting geometry and the crop grown under 60cm × 15cm planting geometry had 22.32%, 9.65% and 14.98% higher cob yield than 45cm × 15cm, 45cm × 20cm and 60cm × 20cm planting geometries, respectively. Similarly baby corn yield was recorded significantly higher at 60cm × 15cm planting geometry with 1.9%, 17.3% and 24.7% higher than 45cm × 20cm, 60cm × 20cm and 45cm × 15cm planting geometries, respectively. Das *et al.* (2009) also reported similar results. The green fodder yield was recorded significantly higher under 45cm × 15 cm followed by 45cm × 20cm mainly because of higher plant population. The TSS and protein did not influence significant by planting geometries. Significantly higher net return and B:C ratio were also recorded at 60cm × 15cm followed by 45cm × 20cm planting geometry (Table 1).

Nutrient management practices also had significant effect yield, quality and economics of baby corn production (Table 1). The results revealed that application of 180 kg N+ 90 kg P_2O_5 + 60 kg K_2O gave significantly higher values of cob and baby corn yield, quality attributes and also economics. Application of 180:90:60 gave 1.5% and 9.5% higher baby corn yield than 150:75:50 and 120:60:40, respectively. It also gave higher TSS, protein content, net profit and also B:C ratio. Similar finding were also reported by Hassan *et al.* (2005) and Hokmalipour *et al*. (2010).

On the basis of experimental results, it was found that planting of baby corn at 60cm × 15cm geometry fertilized with 180kg N+90kg P_2O_5+60kg K_2O /ha had higher productivity, profitability and better quality of baby corn production.

Table 1: Effect of planting geometry and nutrient management on baby cob yield, baby corn yield, TSS, protein content and economics of baby corn

Treatment	Baby cob yield (t/ha)	Baby corn yield (t/ha)	Green fodder yield (t/ha)	Total soluble sugar (%)	Protein content (%)	Net profit (Rs/ha)	B:C ratio
A. Planting Geometry							
P1: 45cm × 15cm	10.06	1.74	22.1	8.0	10.6	67790	3.87
P2: 45cm × 20cm	11.70	2.13	21.6	8.3	10.7	87650	4.78
P3: 60cm × 15cm	12.95	2.17	18.0	8.2	10.6	88250	4.86
P4: 60cm × 20cm	11.01	1.85	17.3	8.3	10.9	74220	4.41
SEm±	0.02	0.04	0.65	0.2	0.3	1422	0.06
CD (p=0.05)	0.05	0.11	2.1	ns	ns	4266	0.18
B. Nutrient Levels							
N1: 120:60:40	10.76	1.82	19.1	7.7	10.1	70415	4.25
N2: 150:75:50	11.69	1.98	19.8	8.4	10.8	76764	4.29
N3: 180:90:60	11.85	2.01	20.2	8.6	11.2	91254	4.87
SEm±	0.01	0.02	0.10	0.1	0.2	1979	0.06
CD (p=0.05	0.04	0.06	0.39	0.3	0.7	5937	0.18
Interaction	S	ns	ns	ns	ns	ns	ns

Selling price of Baby corn – Rs. 50/kg and Green fodder – Rs. 20/q

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