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Effect of different doses of N and farm yard manure on quality of baby corn (*Zea mays* L.) under Uttarakhand condition

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Abstract

The field experiment conducted on Effect of different doses of N and farm yard manure on quality of baby corn (*Zea mays* L.) under Uttarakhand condition at the Students' Research Farm Uttaranchal (PG) College of Bio-Medical Sciences & hospital, Dehradun during the *Kharif* season of 2016. The experiment was carried out in randomized complete block design (RCBD) having 7 treatments viz. T₁ (Control), T₂ (100 percent of recommended inorganic N), T₃ (5 tonnes of FYM ha⁻¹ + 100 kg inorganic N ha⁻¹), T₄ (10 tonnes of FYM ha⁻¹ + 75 kg inorganic N ha⁻¹), T₅ (15 tonnes of FYM ha⁻¹ + 50 kg inorganic N ha⁻¹) T₆ (20 tonnes of FYM ha⁻¹ + 25 kg inorganic N ha⁻¹) and T₇ (25 tonnes of FYM ha⁻¹) with four replications. It revealed that application of combined FYM and chemical fertilizers in a exacting combination through treatments having integrated nutrient management might have resultant timely and proper availability of nutrients which improved the soil physical and chemical properties and also increased the TSS content in baby corn significantly. It also concluded that increase in protein content may be due to availability of N in plants at proper time and in appropriate amount by the mean of treatments involving integrated nutrient management or recommended dose of N.

Keywords: Cob per plant, yield, inorganic, cob weight, cob girth and cob length etc

Introduction

Baby corn is the ear of maize (*Zea mays* L.) plant harvested young, especially when the silk have either not been emerged or just emerged, and no fertilization has taken place, depending on the cultivar grown. Nutritive value of baby corn is very high as it contains 89.1 percent moisture, 0.20 g fat, 8.20 mg carbohydrates, 1.90 g protein, 28.0 mg calcium, 86.0 mg phosphorus, 0.10 mg iron, 0.05 mg thiamine, 0.08 mg riboflavin, 11.0 mg ascorbic acid, 0.03 mg niacin etc, per 100 g of edible portion (Das *et al.*, 2008). Baby corn is a nutrient exhaustive crop and due to high planting density, the integrated nutrient management (INM) practice is important to retain productivity of the soil along with heavy returns. The integrated nutrient management maximizes the nutrient use efficiency and avoid over exploitation of natural resources. It also helps farmers in saving money to be spent on costly inorganic fertilizers. It holds great promise in meeting the growing nutrient demands of intensive agriculture and maintaining the crop productivity at a fairly high level. Thus a judicious combination of organic manures and chemical fertilizers may help to maintain soil and crop productivity. It also helps in restoring fertility of soil and improves nutrient use efficiency which is essential for improved and sustainable crop production. Therefore, the present study conducted on Effect of different doses of N and farm yard manure on quality of baby corn (*Zea mays* L.) under Uttarakhand condition''

Materials and Methods

The field experiment conducted on Effect of different doses of N and farm yard manure on quality of baby corn (*Zea mays* L.) under Uttarakhand condition at the Students' Research Farm Uttaranchal (PG) College of Bio-Medical Sciences & hospital, Dehradun during the *Kharif* season of 2016. Dehradun is located at 41° North latitude and 44° East longitudes and at an altitude of 660 metres above mean sea level. This tract is characterized by Sub Tropic climate, where both winters and summers are extreme. A maximum temperature of about 41°-42 °C in summer while freezing temperature is accompanied by frost occurrence in the months of December and January. The monsoon generally starts in first week of July and the mean annual rainfall fluctuates around 1170 mm, the major part of which is received during the

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months of July to September with a few showers rains during winter months.

The experiment was carried out in randomized complete block design (RCBD) having 7 treatments viz. T₁ (Control), T₂ (100 percent of recommended inorganic N), T₃ (5 tonnes of FYM ha⁻¹ + 100 kg inorganic N ha⁻¹), T₄ (10 tonnes of FYM ha⁻¹ + 75 kg inorganic N ha⁻¹), T₅ (15 tonnes of FYM ha⁻¹ + 50 kg inorganic N ha⁻¹) T₆ (20 tonnes of FYM ha⁻¹ + 25 kg inorganic N ha⁻¹) and T₇ (25 tonnes of FYM ha⁻¹) with four replications. 5 plants selected randomly from each plots. Data related to after harvesting samples were sent to the laboratory of Food-technology department of Guru Nanak Dev

University Dehradun for analysis of TSS and Protein content in baby corn. Where TSS of five random samples of baby corn from each plot was analyzed by using hand refractometer and for protein content nitrogen in samples was analyzed by Kjeldhal method and it was multiplied by universal factor 6.25 and protein content percentage was obtained. Recorded data was analyzed statistically as per randomized block design (Cochran and Cox, 1963), using OPSTAT software developed by the Department of Mathematics Statistics, CCS HAU, Hisar. The comparisons were made at five percent level of significance.

Analysis of variance

Source of variation	Degree of freedom	Sum of squares	Mean sum of squares	F calculated value
Replication	(r-1)	Sr	Sr/r-1=Mr	Mr/Me
Treatment	(t-1)	St	St/t-1=Mt	Mt/Me
Error	(r-1)(t-1)	Se	Se/(r-1)(t-1)=Me	

Where,

r = number of replications

t = number of treatments

Sr = sum of square due to replications

St = sum of square due to treatments

Se = sum of square due to error

Me = mean sum of square due to replication

Mt = mean sum of square due to treatment

Me = mean sum of square due to error

Result and Discussion

The data related to TSS is concerned with the quality traits table-1. It depicted from table -1 that treatment T₃ (5 tonnes of

FYM + 100 kg N through inorganic source) produced significantly greater TSS content than all the other treatments except the treatment T₂ (100% recommended dose of nitrogen) which exhibit statistical parity with the treatment T₃. However, statistically lower TSS in baby corn was recorded with the treatment T₁ (control plot).

Therefore it revealed that combined application of FYM and chemical fertilizers in a particular combination through treatments having integrated nutrient management, might have resulted in timely and proper availability of nutrients and also improved soil physical and chemical properties that increased the TSS in baby corn significantly.

Table 1: Effect of integrated nutrient management on TSS (%) content of baby corn (*Zea mays* L.)

Treatment	TSS Content (%)
T ₁ Control	7.52
T ₂ 100 percent of recommended N	10.1
T ₃ 5 tonnes of FYM+100 kg inorganic N ha ⁻¹	10.2
T ₄ 10 tonnes of FYM + 75 kg inorganic N ha ⁻¹	9.73
T ₅ 15 tonnes of FYM + 50 kg inorganic N ha ⁻¹	9.55
T ₆ 20 tonnes of FYM + 25 kg inorganic N ha ⁻¹	9.36
T ₇ 25 tonnes of FYM ha ⁻¹	8.83
C D (p = 0.05)	0.19

It revealed from table-2 that protein content in Baby corn is an important parameter for judging the quality of baby corn. Data in the Table 2 revealed that treatment T₃ (5 tonnes of FYM+100 kg inorganic N ha⁻¹) produced significantly higher protein content in baby corn than all the other treatments. It also revealed from table-2 that treatment T₁ was found to be

significantly lower than all other treatments for protein content in baby corn.

Therefore, it revealed from table -2 that the increase in protein content may be due to availability of N to plants at proper time and appropriate amount through treatments involving integrated nutrient management or recommended dose of N.

Table 2: Effect of integrated nutrient management on protein content (%) of baby corn (*Zea mays* L.)

Treatment	Protein Content (%)
T ₁ Control	13.79
T ₂ 100 percent of recommended N	17.96
T ₃ 5 tonnes of FYM+100 kg inorganic N ha ⁻¹	18.04
T ₄ 10 tonnes of FYM + 75 kg inorganic N ha ⁻¹	17.78
T ₅ 15 tonnes of FYM + 50 kg inorganic N ha ⁻¹	17.59
T ₆ 20 tonnes of FYM + 25 kg inorganic N ha ⁻¹	17.42
T ₇ 25 tonnes of FYM ha ⁻¹	17.23
C D (p = 0.05)	0.13

Summary and Conclusion

Therefore, it concluded that application of combined FYM and chemical fertilizers in a exacting combination through treatments having integrated nutrient management might have resultant timely and proper availability of nutrients which improved the soil physical and chemical properties and also increased the TSS content in baby corn significantly. It also concluded that increase in protein content may be due to availability of N in plants at proper time and in appropriate amount by the mean of treatments involving integrated nutrient management or recommended dose of N.

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