



PRODUCTIVITY AND YIELD MAXIMIZATION OF BABY CORN (*ZEAMAYS L.*) AS INFLUENCED BY INTEGRATED NUTRIENT MANAGEMENT PRACTICES AND FOLIAR APPLICATION

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Abstract

Field experiments were conducted to study the effect of graded levels of inorganic nitrogen in combination with various sources of organic manures and panchagavya as foliar spray on hybrid baby corn G-5414 at the Experimental Farm, Department of Agronomy, Faculty of Agriculture, Annamalai University, Annamalainagar, Tamilnadu. The treatments were tested in RBD and replicated thrice. The effect of application of 100 % recommended dose of nitrogen as inorganic + Vermicompost @ 5 t ha⁻¹ + 3 sprays of 3% panchagavya favourably influenced the yield parameters in culminating the highest baby corn yield per hectare, which was higher than that of the control. The economic analysis of various treatments imposed revealed that application of 100% recommended dose of nitrogen as inorganic + Vermicompost @ 5 t ha⁻¹ + 3 sprays of 3 % panchagavya recorded the highest gross and net return of Rs. 147400 and Rs. 98287, which ultimately resulted in registering the highest benefit cost ratio as 3.00.

Key words : Integrated Nutrient Management, yield maximization, baby corn.

Introduction

Baby corn (also known as young corn, mini corn or candle corn) is the ear of maize (*Zea mays L.*) plant harvested young especially when the silks have either not emerged or just emerged and no fertilization has taken place. The Baby corn hybrid G-5414, is a high yielding male sterile with uniform sized creamy ears and they are light yellow in colour with regular row arrangement, 10 to 12 cm long with a diameter of 1.0 to 1.5 cm arrangement is preferred in the market. It is a high nutritive value crop, for every 100 gram of edible portion; it contains 88.10 per cent moisture, 8.20 g carbohydrates, 1.90 g protein, 0.20g fat, 28.00 mg calcium, 86.00 mg phosphorus, 0.10 mg iron, 0.50 mg thiamine, 0.08 g riboflavin and 11.00 mg of ascorbic acid. The entire miniature ear of baby corn is edible. Baby corn can be eaten raw or cooked. It is used in variety of traditional and continental dishes besides being canned. Due to its high succulence, palatability and digestibility, it is considered to be an ideal fodder crop and it can be used at any stage of its growth.

Its green fodder is especially suited for milch cattle as it has lactogenic properties. Baby corn cultivation provides tremendous avenue for diversification, value addition and revenue generation. In the light of recently liberalized policy of government to boost export trade and food industry development, baby corn production on maize belts of India stands better promise for export trade, high income generation and for creation of employment in agriculture sector through canning and dairy industries. For better utilization of resources and to produce crops with less expenditure, INM is the best approach. The combined use of organic and inorganic sources of plant nutrient not only pushes the production and profitability of baby corn, but also it helps in maintaining the permanent fertility status of the soil.

Materials and Methods

Field experiments were conducted in the Experimental Farm, Department of Agronomy, Faculty of Agriculture, Annamalai University, Annamalainagar with Baby corn Hybrid G-5414. The treatments comprised of an absolute control T₁ with no application of organics

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Table 1 : Yield attributes and yield of baby corn G-5414.

Treatments	Cob length (cm)	Cob diameter (cm)	No of cobs per plant	Cob yield (Kg ha ⁻¹)	Stover yield (Kg ha ⁻¹)
T ₁	13.57	2.62	1.13	2640	12.17
T ₂	19.82	4.77	2.27	5071	18.41
T ₃	19.05	4.45	2.13	4448	16.43
T ₄	20.68	5.04	2.51	5693	19.13
T ₅	15.99	3.32	1.33	3582	13.28
T ₆	20.27	4.89	2.40	5402	18.86
T ₇	18.49	3.92	1.45	3868	14.37
T ₈	21.20	5.19	2.64	6493	20.20
T ₉	18.63	4.35	1.95	4163	15.52
T ₁₀	21.05	5.17	2.63	6341	20.06
T ₁₁	19.44	4.63	2.15	4751	18.12
T ₁₂	22.43	5.32	2.81	6845	21.00
SEd	0.173	0.043	0.014	135.00	125.36
CD (P=0.05)	0.36	0.09	0.03	280	260

Table 2 : Economic analysis of various treatments on baby corn G-5414.

Treatments	Cost of cultivation (Rs.ha ⁻¹)	Gross income (Rs.ha ⁻¹)	Net income (Rs.ha ⁻¹)	Return per rupee invested
T ₁	30345	58885	26845	1.5
T ₂	47005	110625	63619	2.35
T ₃	48250	97175	48925	2.01
T ₄	48571	123425	74854	2.54
T ₅	48966	79280	30313	1.61
T ₆	49378	117470	68091	2.37
T ₇	45432	84545	39112	1.86
T ₈	48954	139960	91005	2.85
T ₉	47845	91020	43175	1.90
T ₁₀	48510	136850	88340	2.82
T ₁₁	104080	48742	55337	2.13
T ₁₂	49112	147400	98287	3.00

and inorganics.

T₂ – 100 % RDN + 3 sprays of 3% panchagavya

T₃ – 75 % RDN + poultry manure @ 5t ha⁻¹ + 4 sprays of 4% panchagavya

T₄ – 100 % RDN +poultry manure @ 5t ha⁻¹ + 3 sprays of 3% panchagavya

T₅ – 75 % RDN + FYM @ 10 t ha⁻¹ + 4 sprays of 4% panchagavya

T₆ – 100% RDN + FYM @ 10 t ha⁻¹ + 3 sprays of 3% panchagavya

T₇– 75% RDN + EFYM @ 750 kg ha⁻¹ + 4 sprays of 4% panchagavya

T₈ – 100% RDN + EFYM @ 750 kg ha⁻¹ + 3 sprays of 3% panchagavya

T₉– 75 % RDN + EPC @ 750 kg ha⁻¹ + 4 sprays of

4% panchagavya

T₁₀ – 100 % RDN + EPC @ 750 kg ha⁻¹ + 3sprays of 3% panchagavya

T₁₁ – 75 % RDN + vermicompost @ 5 t ha⁻¹ + 4 sprays of 4% panchagavya

T₁₂ – 100% RDN + vermicompost @ 5 t ha⁻¹ + 3 sprays of 3% panchagavya.

Results and Discussion

The results of the experiments revealed that the application of 100% recommended dose of nitrogen as inorganic + Vermicompost @ 5 t ha⁻¹ + 3 sprays of 3% panchagavya favourably influenced the yield parameters viz., cob length, cob diameter, number of cobs per plant in baby corn, cob yield, stover yield. The above treatment also projected an increased cob yield over the control.

Among the various treatments imposed the treatment with 100 % recommended dose of nitrogen as inorganic + Vermicompost @ 5 t ha⁻¹ + 3 sprays of 3% panchagavya (T₁₂) registered the highest gross and net return of Rs.147400 and Rs.98287, thus leading to realize highest return per rupee invested as 3.00 and the least uptake of nutrients was recorded in the control treatment. The least gross and net return of Rs. 58885 and Rs. 26845 was registered in the control treatment, which ultimately resulted in registering the lowest return per rupee invested of 1.5.

The results of the experiment revealed that organic manures with inorganic fertilizer distinctly influenced the yield attributes of baby corn than control. Application of 100% recommended dose of nitrogen as inorganic + Vermicompost @ 5 t ha⁻¹ + 3 sprays of 3% panchagavya exhibited an accelerated effect on yield attributes, which is mainly due to addition of mineral nitrogen along with the vermicompost that influenced the stalk thickness of the plants more positively than just a standalone application of vermicompost. This effect could be attributed to the fact that the addition of mineral fertilizer accelerated mineralization processes in the soil and, therefore was able to release enough and easily available nutrients of vermicompost (Maria Kmetova and Peter Kovacik, 2014).

Highest cob yield and Stover yield also was recorded

in the treatment (T₁₂) could be the abundant supply of nutrients which have increased the protoplasmic constituents and accelerated the process of cell division and elongation. This in turn resulted in increased yield. Yield increase in (T₁₂) was due to the hormonal substances present in *panchagavya* especially cytokinin which plays a vital role in vegetative plant parts with nutrient partitioning in reproductive parts, high levels of nutrient mobilization. Increase in yield was also due to fact that cow dung in *panchagavya* act as a medium for the growth of beneficial microbes and cow urine provides nitrogen which is essential for crop growth (De Britto and Girija, 2006; Patil *et al.*, 2012).

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