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## Response of Integrated nutrient management on growth and yield related attributes of Baby Corn [*Zea mays* (L.)]

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### Abstract

A field experiment entitled “Response of integrated nutrient management on growth and yield attributes of Baby Corn [*Zea mays* (L.)]” was conducted at the experimental farm of School of Agriculture, Lovely Professional University. The study's objective was to evaluate the influence of plant nutrient application through organic manures and inorganic fertilizer on growth, yield and economics of baby corn production. The overall experiment was laid out in Randomized Block Design (RBD) with three replications and ten treatments comprising of chemical fertilizers, organic manure, and their combinations viz., T<sub>Control</sub>, T<sub>100%</sub> RDF, T<sub>100%</sub> FYM, T<sub>100%</sub> Vermicompost, T<sub>75%</sub> RDF + 25% FYM, T<sub>75%</sub> RDF + 25% Vermicompost, T<sub>75%</sub> RDF + 12.5% FYM + 12.5% Vermicompost, T<sub>50%</sub> RDF + 50% FYM, T<sub>50%</sub> RDF + 50% Vermicompost, T<sub>50%</sub> RDF + 25% FYM + 25% Vermicompost. The results revealed that T<sub>100%</sub> RDF showed the maximum growth followed by T<sub>75%</sub> RDF + 25% Vermicompost. The yield attributes viz., no. of cobs per plant, girth of baby corn, length of baby corn, cob wt with husk, cob wt without husk was increased significantly in T<sub>75%</sub> RDF + 25% Vermicompost (183.45%, 134.43%, 46.2%, 48.66%, 77.47%) followed by T<sub>100%</sub> RDF (150.37%, 100.66%, 38.44%, 37.99%, 68.36%) as compared to T<sub>control</sub>. The higher yield attributes of baby corn is mainly due to the combined application of organic manures and inorganic fertilizer.

**Keywords:** Plant nutrient, chemical fertilizer, FYM, vermicompost, cob yield

### 1. Introduction

In Indian farming, baby corn is attaining priority and popularity nowadays because of its high nutritive value, as compared to other the baby corn is having a relatively very short duration and the most vital thing is it has a higher market rate as it is used for multipurpose. It is also termed vegetable corn or mini corn. The early tender inflorescence of maize ears which are harvested within 2-4 days after emergence of white silk before fertilizer application is referred to as the baby corn (Wilai Satitsirikul, 1989; Pandey *et al.*, 2000) [16, 11]. Baby corn with the recommendable size of length and diameter is 6-11 cm and 1-1.5 cm respectively having the arrangement of regular row/ovule. Usually, creamish to very pale-yellow color by the consumers is the most desirable color (Pal, 2011) [10]. It is used as a vegetable in various dishes like salad, soup, pickle, kheer, murabba, chutney, Manchuria, halwa, etc. Baby maize is highly nutritious i.e., 100 mg of mini corn containing 11.0 mg ascorbic acid, 1.9 g protein, 8.2 mg carbohydrate, 0.06 g ash, 89.1% moisture, 0.2 g fat, 28.0 mg calcium, 86.0 mg phosphorus (Das *et al.*, 2009) [4]. Rich in riboflavin and ascorbic acids, fiber, potassium, and vitamins (Miles and Sahffner 1999) [9]. In comparison to 21-57 mg in other vegetables, the content is affluent in phosphorous (86 mg/100 g in a supply). It is a low-calorie attraction and cholesterol low and has an excellent source of starchy carbohydrates. Baby maize is highly appreciated for those with weight consciousness and low fat, carbohydrate, and fiber (Anitha and Rajyalakshmi 2005) [11]. Baby corn requires a consistent and regulated supply of nutrients throughout its growing period, from seedling to maturity. Combining organic manures with inorganic fertilizers decreases the amount of chemical fertilizers used while increasing yield and quality of produce. As a result, for optimal benefit, an integrated nutrient management strategy is required. It refers to the improvement and maintenance of soil fertility and land productivity through the integration of benefits from all potential sources of organic, inorganic, and biological components, as well as the reduction of environmental deterioration.

### 2. Materials and Methods

The present study was conducted during the spring season of 2021 at the experimental farm of

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department of agronomy, School of Agriculture, Lovely Professional University, Jalandhar, Punjab. The soil of experimental site was sandy loam in texture with pH range of 7.5-9.1 low nitrogen and phosphorus content and good potassium content. The overall experiment was laid out in Randomized Block Design (RBD) with 3 replications and 10 treatments comprising of chemical fertilizers, organic manure, and their combinations viz., T<sub>Control</sub>, T<sub>100% RDF</sub>, T<sub>100% FYM</sub>, T<sub>100% Vermicompost</sub>, T<sub>75% RDF + 25% FYM</sub>, T<sub>75% RDF + 25% Vermicompost</sub>, T<sub>75% RDF + 12.5% FYM + 12.5% Vermicompost</sub>, T<sub>50% RDF + 50% FYM</sub>, T<sub>50% RDF + 50% Vermicompost</sub>, T<sub>50% RDF + 25% FYM + 25% Vermicompost</sub>. Both FYM and Vermicompost were applied and mixed well in soil one week prior to sowing.

### 3. Results and Discussion

The results regarding plant height (cm), chlorophyll index (SPAD meter), dry matter accumulation (g), crop growth rate

(g/m<sup>2</sup>/day), no. of cobs per plant, girth of baby corn (cm), length of baby corn (cm), cob wt with husk (g), cob wt without husk (g).

#### 3.1 Growth parameters

Plant height (cm), chlorophyll index (SPAD meter), dry matter accumulation, crop growth rate was significantly influenced by various treatments. Incorporation T<sub>100% RDF</sub> leads to highest Plant height (172.6 cm), chlorophyll index (43.73), dry matter accumulation (224.19 g), crop growth rate (27.22 g/m<sup>2</sup>/day) followed by T<sub>75% RDF + 25% Vermicompost</sub> and by T<sub>75% RDF + 25% FYM</sub> respectively. Similar findings regarding plant height were seen in Md. Asaduzzaman *et al.*, (2014) [2], chlorophyll index seen in Singh *et al.*, (2010) [13], dry matter accumulation seen in Singh *et al.*, 2012, crop growth rate seen in Kumar *et al* (2014) [6].

**Table 1:** Response of Integrated nutrient management on Plant height (cm), Chlorophyll index (SPAD meter), Dry matter accumulation (g), Crop Growth Rate (g/m<sup>2</sup>/day)

Treatments	Plant height (cm)	Chlorophyll index (SPAD meter)	Dry matter accumulation (g)	Crop growth rate (g/m <sup>2</sup> /day)
Control	102.93	29.51	111.22	10.81
100% RDF	172.6	43.73	224.19	27.22
100% FYM	129.91	38.20	134.88	15.54
100% Vermicompost	137	39.05	148.01	17.35
75% RDF + 25% FYM	163.42	41.87	203.23	23.61
75% RDF + 25% Vermicompost	168	43.40	217.54	24.79
75% RDF + 12.5% FYM + 12.5% Vermicompost	153.67	39.18	159.49	18.58
50% RDF + 50% FYM	153.61	39.93	163.88	19.76
50% RDF + 50% Vermicompost	159.4	42.13	187.13	22.29
50% RDF + 25% FYM + 25% Vermicompost	155.98	42.08	186.47	21.37

#### 3.2 Yield attributes

The following yield parameters such no. of cobs per plant, girth of baby corn (cm), length of baby corn (cm), cob wt with husk (g), cob wt without husk (g) are significantly influenced by combination of organic manures and inorganic fertilizers, where as maximum was obtained with T<sub>75% RDF + 25% Vermicompost</sub> i.e., 3.77, 3.54 cm, 9.43 cm, 69.22 g, 17.73 g, and minimum

was obtained with T<sub>Control</sub> 1.33, 1.51 cm, 6.54 cm, 46.56 g, 9.99 g. Similar findings regarding no. of cobs per plant, girth of baby corn (cm) seen in Mahapatra *et al.*, (2018) [7], length of baby corn (cm) seen in Meena *et al.*, (2012) [8], cob wt with husk (g) seen in Saha and Mondal, (2006) [12], cob wt without husk (g) seen in Dadarwal *et al.*, (2009) [3].

**Table 2:** Response of Integrated nutrient management on No. of cobs per plant, Girth of baby corn (cm), Length of baby corn (cm), Cob wt with husk (g), Cob wt without husk (g)

Treatments	No. of cobs per plant	Girth of baby corn(cm)	Length of baby corn (cm)	Cob wt with husk (g)	Cob wt without husk (g)
Control	1.33	1.51	6.45	46.56	9.99
100% RDF	3.33	3.03	8.93	64.25	16.82
100% FYM	1.66	1.77	7.16	54.11	12.67
100% Vermicompost	2	1.95	7.41	55.53	12.91
75% RDF + 25% FYM	3	2.51	8.58	63.68	15.51
75% RDF + 25% Vermicompost	3.77	3.54	9.43	69.22	17.73
75% RDF + 12.5% FYM + 12.5% Vermicompost	2	2.28	7.58	55.7	13.19
50% RDF + 50% FYM	2.33	2.37	8.11	59.75	14.06
50% RDF + 50% Vermicompost	2.66	2.54	8.54	62.59	14.28
50% RDF + 25% FYM + 25% Vermicompost	2.33	2.23	7.85	58.47	14.4

### 4. Conclusion

It was concluded chemical fertilizers when applied in combination with organic manures produced significantly higher yield attributes viz., no. of cobs per plant, girth of baby corn, length of baby corn, cob wt with husk, cob wt without husk.

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