

RESEARCH PAPER

# Effect of Detasseling and Organic Nutrient Management on The Growth, Yield attributes and Yield of Baby Corn Under Costal Part of West Bengal

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## ABSTRACT

Maize has emerged as an important crop due to its wider adaptability and high yield potential. Baby corn is an off shoot of maize which is grown for its young, fresh, finger like green cobs, harvested at the time of silk emergence and before pollination and fertilization. The present study was carried out at the Instructional farm, School of Agriculture and Allied Sciences, the Neotia University Sarisha, Jhinga, South 24 parganas, West Bengal to study the effect of detasseling and organic nutrient management on the growth and yield of baby corn during the *Rabi* season of 2024-2025. The experiment was carried out in split plot design replicated thrice, having three different level of detasseling time in main plots, viz., D<sub>1</sub>: no detasseling (control), D<sub>2</sub>: detasseling immediately after tassel emergence and D<sub>3</sub>: detasseling at 7 days after tassel emergence, and three different level of organic nutrient management in sub-plots, namely, N<sub>1</sub>: 4 t vermicompost/ha, N<sub>2</sub>: 4 t vermicompost/ha + Jeevamruta (at 30 says interval) and N<sub>3</sub>: 4 t vermicompost/ha + Jeevamruta + Amrutpani (at 60 says interval). Detasseling time and application of organic nutrient management significantly influenced the growth attributes, yield attributes and yield of baby corn as the detasseling after seven days after tassel emergence and the application of 4 t vermicompost/ha + Jeevamruta (at 30 says interval) resulted in their superiority over other treatment combinations.

## HIGHLIGHTS

- Detasseling at seven days after tassel emergence recorded the highest values of growth attributes, yield attributes and yield of baby corn.
- Application of 4 t vermicompost/ha + Jeevamruta (at 30 says interval) recorded highest growth, yield attributes and yield of baby corn.

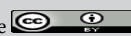
**Keywords:** Baby corn, Detasseling, Jeevamruta, Amrutpani, Vermicompost

The current agriculture is severely threatened by the degradation and shrinkage of land, pollution and shortage of water and climatic factors (Nungula *et al.* 2022; Sairam *et al.* 2023; Santosh *et al.* 2023). To combat with the adverse effects of the above, there is an urgent need of the adoption of climate-resilient approaches which are made up of ecologically friendly with the low carbon foot-print (Maitra *et al.* 2001; Gaikwad *et al.* 2022; Rezaei-Chiyaneh *et al.*

2023). In this regard, use of organic inputs may be a viable option in crop production (Mwadalu *et al.* 2022; Maitra *et al.* 2025). There is a huge demand

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of organically produced crops because of their quality and unpolluted nature, which attracted farmers to grow high-value crops organically to create a considerable market demand (Maitra and Palai, 2018).

Maize, this term derived from the Haitian Arawak language and the Spanish word “*mahiz*” is widely recognized as a staple food crop, ranking third in global production after rice and wheat (Zaman *et al.* 2017; Bhattacharyya *et al.* 2022; Sairam *et al.* 2025a,b). One of the most widely used agricultural crops worldwide is maize (*Zea mays* L.). Baby corn (*Zea mays* L.) was introduced as a vegetable crop around the world for crop diversification and for its value addition in maize (Hrudaya *et al.* 2024). It is an off shoot of maize which is grown for its young, fresh, finger like green ears, harvested at the time of silk emergence and before pollination and fertilization. It is known as ‘the Queen of Cereals’ (Hossain *et al.* 2021). It indicates complete, fully consumable cobs of immature maize taken immediately prior to fertilization at the silk emergence phase (Ghosh *et al.* 2021; Sairam *et al.* 2024; Maheswari *et al.* 2025).

Baby corn, a rapidly expanding cereal crop in India, is seeing greater cultivation due to its economic feasibility and export potential. Due to good agro-climatic conditions and demand from both local and foreign markets, India has been producing more baby corn, particularly in areas like Karnataka, Maharashtra, Punjab, and Uttar Pradesh (Shashidhara *et al.* 2022). The crop’s short lifespan and versatility across various cropping methods make it the favoured choice. Although there is a wealth of research on maize farming in India, there are still few studies that focus on baby corn. According to trends in maize production, Bihar, Andhra Pradesh, and Karnataka have the highest profitability because of superior net returns and benefit-cost ratios; this pattern probably holds true for baby corn as well (Cheptoek *et al.* 2021; Patel *et al.* 2024).

Vermicomposting involves creating a nutrient-dense organic fertilizer by decomposing organic waste with the help of earthworms. This method boosts soil health by increasing microbial activity, nutrient levels, and the ability to retain moisture. As earthworms process organic materials, they transform them into humus-like substances that contain vital nutrients, including nitrogen,

phosphorus, and potassium, which are extremely advantageous for plant development (Maitra and Zaman, 2017; Maitra and Gitari, 2020; Edwards and Arancon, 2022). Moreover, vermicomposting aids in waste management by transforming organic waste, decreasing the strain on landfills, and lowering greenhouse gas emissions, thus supporting environmental sustainability (Dominguez *et al.* 2019; Ray *et al.* 2025a). Vermicomposting is quicker and results in a more polished and stable organic amendment when compared to traditional composting. Due to its many advantages, vermicompost is extensively used in organic agriculture, horticulture, and agroforestry as a sustainable and economical soil amendment. Upcoming research aims to improve large-scale production and enhance nutrient interactions to better its agricultural uses (Mohanty *et al.* 2016; Pramanik *et al.* 2020).

Jeevamrut, a natural stimulant for plant growth, has its roots in traditional agricultural methods from India. Jeevamrut serves as an eco-friendly fertilizer and soil amendment that leverages the capabilities of advantageous microorganisms to boost plant development and enhance soil productivity. This mixture is composed of a blend of cow dung, cattle urine, jaggery, legume flour, and water. These elements undergo fermentation in specific proportions to stimulate the multiplication of beneficial microbes, including bacteria, fungi, and actinomycetes. The fermentation process in Jeevamrut facilitates the breakdown of ingredients, making nutrients more accessible to plants. This natural fertilizer enhances soil productivity, boosts nutrient absorption in plants, and promotes their overall growth and development. The microorganisms in Jeevamrut also establish mutually beneficial relationships with plant roots, improving nutrient uptake and increasing plant tolerance to environmental challenges like drought and diseases. Consequently, this leads to improved plant health, higher yields, and better-quality produce. Jeevamrut is eco-friendly nature is another significant advantage. Crafted from organic materials sourced locally, it is free from harmful synthetic chemicals, making it a sustainable choice for agriculture (Timsina, 2018; Maitra *et al.* 2024; Ray and Sairam, 2024).



In organic nutrient management of crops, Amrutpani is an organic bio-enhancer that increases plant growth, improves soil health, and lessens reliance on chemical fertilizers. It is produced by fermenting ghee, jaggery, cow dung, and cow urine, which results in a nutrient-rich mixture that encourages soil microbial activity. These ingredients are combined in precise amounts during the preparation process, and then the mixture is allowed to ferment for a while to allow the growth of beneficial microorganisms. Amrutpani has a generally positive effect on the environment because it promotes a healthy soil ecosystem, lessens chemical runoff into water bodies, and decreases soil degradation. For it to be widely accepted and standardized, however, scientific validation through multi-location, multi-crop trials and biochemical analyses is still necessary (Biswas and Das, 2022). Amrutpani has an average nutritional composition of 1.68 percent nitrogen, 0.33% mineral phosphorus, and 0.24% potash (Brar *et al.* 2019; Ray *et al.* 2025b).

## MATERIALS AND METHODS

The field experiment was carried out at the Instructional Farm, School of Agriculture and Allied Sciences, The Neotia University Sarisha, Jhinga, South 24 parganas, West Bengal. The farm is located at the 22.261247° N latitude and 88.194338° E longitudes; at an elevation of 7.10 m above mean sea level (MSL) The experimental field was a medium land with good irrigation and drainage facilities. The soil was a typical new alluvial, Inceptisol and loam in texture having moderate water holding capacity (WHC). The percentage of sand, silt and clay were 58.29, 21.78 and 19.93%, respectively. The field experiment was carried out to study the effect of detasseling and organic nutrient management on growth and yield of baby corn under coastal parts of West Bengal. The experiment having 3 detasseling in main plots, viz. D<sub>1</sub>: no detasseling (Control), D<sub>2</sub>: detasseling immediately after tassel emergence and D<sub>3</sub>: detasseling at 7 days after tassel emergence and 3 different level of organic nutrient management in sub-plots, namely, N<sub>1</sub>: 4 t vermicompost/ha, N<sub>2</sub>: 4 t vermicompost/ ha + Jeevamrut (at 30 says interval) and N<sub>3</sub>: 4 t vermicompost/ha + Jeevamrut + Amrutpani (at 60 says interval), allotted randomly in 3 replications to study the growth attributes, yield attributes of baby corn variety VNR 4226.

Vermicompost, Jeevamrut and Amrutpani were used as a source of nutrient in baby corn field. Weeding was done manually with the help of khurpi, i.e., hand weeding. 1st weeding is done at 30 DAS and 2nd at 45 DAS. The observations were recorded form 10 randomly selected plants. The data were subjected to statistical analysis using analysis of variance method (Gomez and Gomez, 1984) and the significance of different sources of variations were tested by error mean square using Fisher and Snedecor's 'F' test at a probability level of 0.05.

## RESULTS AND DISCUSSION

Detasseling significantly influenced the plant height (cm.), dry matter accumulation (g/m<sup>2</sup>), leaf area index and crop growth rate (g/m<sup>2</sup>/day) of baby corn. Among the detasseling treatments, the treatment D<sub>3</sub>, i.e. detasseling at 7 days after tassel emergence recorded highest plant height (89.91 cm), dry matter accumulation (1505.60 g/m<sup>2</sup>), leaf area index (0.57) and crop growth rate (22.73 g/m<sup>2</sup>/day) of baby corn. Among the organic nutrient management practices, application of 4 t vermicompost/ha + Jeevamrut + Amrutpani (at 30 days interval), i.e., N<sub>3</sub> recorded highest values of plant height (88.77 cm.), dry matter accumulation (1339.50 g/m<sup>2</sup>), leaf area index (0.54) and crop growth rate (20.16 g/m<sup>2</sup>/day) (Table 1). Application of vermicompost along with other organic manures leads to better growth of baby corn as vermicompost is a rich source of available nutrients (Sangeetha *et al.* 2013; Santosh *et al.* 2022) and can improve the physico-chemical and biological properties of the soil.

The enhancement of plant growth due to the combined application of vermicompost along with other organic manures may not only be the nutritional effect but also due to the content of active plant growth-promoting ingredients. It might have increased the mineralization of native N and mobilization/ solubilization of occluded soil P, and also release of growth regulators from vermicompost. The results are in conformity with the findings of Warman and Anglopez (2010) and Atiyeh *et al.* (2002). The beneficial effect of vermicompost on plant growth could be attributed to the presence of relatively readily available plant nutrients, growth enhancing substances and the presence of beneficial micro-organisms, i.e.,

**Table 1:** Effect of detasseling and organic nutrient management on the growth attributes of baby corn

Treatments	Plant height at harvest (cm.)	Dry matter accumulation height at harvest (g/m <sup>2</sup> )	Leaf area index (LAI)		crop growth rate (CGR) (g/m <sup>2</sup> /day)		
			30 DAS*	60 DAS*	30 DAS*	60 DAS*	At Harvest
Detasseling							
D <sub>1</sub>	76.83	1007.00	0.13	0.42	7.72	14.57	11.85
D <sub>2</sub>	82.50	1316.60	0.14	0.54	8.56	18.44	18.55
D <sub>3</sub>	89.91	1505.60	0.14	0.57	9.08	18.64	22.73
S. Em (±)	1.91	60.19	0.004	0.02	0.38	1.14	0.77
C. D. (9=5) (p=0.05)	5.31	167.12	NS	0.08	NS	NS	2.15
C.V. (%)	6.92	14.14	—	16.77	—	—	13.16
Organic nutrient Management							
N <sub>1</sub>	79.06	1192.00	0.14	0.47	8.22	17.12	15.39
N <sub>2</sub>	81.19	1297.60	0.13	0.53	8.53	14.73	17.58
N <sub>3</sub>	88.77	1339.50	0.14	0.54	8.61	19.80	20.16
S. Em (±)	2.54	27.92	0.01	0.01	0.26	1.12	0.75
C. D. (p=0.05)	5.53	60.84	NS	0.03	NS	2.44	1.65
C.V. (%)	9.18	6.56	—	10.53	—	19.56	12.86

D<sub>1</sub>: no detasseling (control), D<sub>2</sub>: detasseling immediately after tassel emergence and D<sub>3</sub>: detasseling at 7 days after tassel emergence, N<sub>1</sub>: 4 t vermicompost/ha, N<sub>2</sub>: 4 t vermicompost/ha + Jeevamrut (at 30 says interval) and N<sub>3</sub>: 4 t vermicompost/ha + Jeevamrut + Amrutpani (at 60 days interval); \*DAS: days after sowing.

**Table 2:** Effect of detasseling and organic nutrient management on yield attributes and yield of baby corn

Treatments	Cob per plant	Cob length (cm.)	Cob girth (cm.)	Cob with husk (g)	Cob without husk (g/cob)	Cob yield (q/ha)	Stover yield (q/ha)
Detasseling							
D <sub>1</sub>	1.38	7.20	2.93	17.86	8.12	16.30	30.76
D <sub>2</sub>	1.66	8.11	4.22	23.68	10.91	19.53	33.16
D <sub>3</sub>	1.52	7.65	3.01	21.12	9.92	18.10	33.76
S. Em (±)	0.03	0.29	0.11	1.23	0.42	0.36	0.82
C. D. (p=0.05)	0.09	NS	0.31	3.42	1.17	1.00	NS
C.V. (%)	6.49	—	9.94	17.90	13.10	6.06	—
Organic nutrient Management							
N <sub>1</sub>	1.43	7.30	3.02	17.86	8.70	16.66	29.85
N <sub>2</sub>	1.53	7.05	3.21	20.38	9.44	17.67	32.42
N <sub>3</sub>	1.61	8.61	3.93	23.72	10.81	19.58	35.42
S. Em (±)	0.04	0.34	0.22	0.93	0.50	0.58	0.73
C. D. (p=0.05)	0.09	0.74	0.48	2.03	1.09	1.28	1.60
C.V. (%)	8.78	13.34	15.87	13.57	15.67	9.81	6.78

Table 1 can be referred for treatment details.

nitrogen-fixing, phosphate solubilizing, cellulose decomposing, and other beneficial microbes. These results confirmed the findings of Ranjan *et al.* (2013), Kalra and Sharma (2015), Shiyam *et al.* (2017) and Yogananda *et al.* (2017).

Detasseling also influenced the yield attributes and yield of baby corn significantly (Table 2). Highest cob per plant (1.66), cob length (8.11 cm.), cob girth

(4.22 cm.), cob with husk (23.68 g/cob), cob without husk (10.91 g/cob) and cob yield (19.53 q/ha). The percentage increase on cob yield of D<sub>2</sub> over D<sub>3</sub> and D<sub>1</sub> were 7.90% and 19.81%, respectively.

The increased husked and dehusked corn yields may be due to a favourable increase of yield attributes by the adaption of detasseling immediately after tassel emergence (Kumar *et al.* 2024). Among the organic



nutrient management practices, N<sub>3</sub> i.e. application of 4 t vermicompost ha<sup>-1</sup> + Jeevamrut + Amrutpani (at 30 days interval) recorded the highest cob per plant (1.61), cob length (8.61 cm.), cob girth (3.93 cm.), cob with husk (23.72 g/cob), cob without husk (10.81 g/cob), cob yield (19.58 q/ha) and biological yield (35.42 q/ha).

Conjoint application of vermicompost + Jeevamrut + Amrutpani enabled higher availability of photosynthates, metabolites and nutrients and produced maximum cob yield of baby corn than other nutrient management treatments. It might be due to better supply of nutrients to the plants for the entire growing period and providing favourable soil condition for better root growth. The results confirmed the findings of Jinjala *et al.* 2016; Babu *et al.* 2020.

The general improvement reflected within the better source-sink relationship, which successively enhanced the yield and yield attributes. Additionally, the availability of plant nutrients through the organic source provided externally, the formation of organic acids through decomposition process also provide the native nutrients within the soil and increases their availability to plants (Khariche *et al.* 2020).

## CONCLUSION

Detasseling and application of organic nutrient management significantly influenced the growth attributes and productivity of baby corn. The highest values of plant height, dry matter accumulation, leaf area index, crop growth rate and the highest economic (cob) yield were achieved by detasseling at 7 days after tassel emergence, and the application of 4 t vermicompost/ha with Jeevamrut + Amrutpani (at 60 days interval).

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