SYNOPSIS

Pre Dissertation

(AGR 591)

Effect of different schedules and fertilizer (Organic and Inorganic) of Baby Corn on corn yield, grain yield and economic profit value

Submitted To

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CERTIFICATE

This is to certified that the synopsis entitled **Effect of different schedules and fertilizer (Organic and Inorganic) of Baby Corn on corn yield, grain yield and economic profit value** submitted in partial fulfillment of requirements for degree of Master of Science (M.Sc.) in Agronomy by **Akanksha** to Department of Agronomy School of Agriculture, Lovely Professional University, has been formulated and finalized by the student himself on the subject.

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DECLARATION

I hereby declare that the project work entitled **Effect of different schedules and fertilizer (Organic and Inorganic) of Baby Corn on corn yield, grain yield and economic profit value** is an authentic record of my work carried at **Lovely Professional University** as requirements of project work for the award of degree of Master of Science in Agronomy, under the guidance of **Dr. Mayur S. Darvhankar**, Assistant Professor, School of Agriculture, Lovely Professional University, Phagwara, Punjab, India.

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INTRODUCTION

Maize (*Zea mays* L.) as the third most important cereal crop in the world following wheat and rice, has been cultivated for centuries as a grain crop and more recently as a vegetable crop, such as baby corn and sweet maize (*Zea mays* var.*saccharata*). (Muthukumar *et al*. 2005; Mahajan *et al*. 2007). Baby corn is the young, finger-length fresh maize ear harvested within 2 or 3 days of silk emergence but prior to fertilization (Almeida *et al*. 2005; Siliva *et al*. 2006; Mahajan *et al*. 2007; Muthukumar *et al*. 2007; Saha *et al*. 2007). Baby corn is a vegetable crop that can potentially improve the economic status of farmers (Das *et al*. 2008). In addition to its sweet, succulent, and delicious taste, baby corn's nutrient value is comparable to other vegetables such as cauliflower, cabbage, and tomato. Thavaprakaash *et al*. (2005) and Das *et al*. (2008) 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.

Globally, as an immature vegetable, baby corn has attracted an increasing number of peoples preference due to the enhancement of living standards and shift in dietary habit from non-vegetarian to vegetarian; however, the production areas are still confined to a few countries, including Thailand, Indonesia, India and Brazil. The greatest production of baby corn is in Thailand with the value of approximate $64 million (US) in 2000 (Stone *et al*. 2008; Chatuchak 2001). In addition to high nutritional value as human food, another benefit of baby corn consists of utilizing husk, silk, and stover as green herbage for feeding ruminants and swine; only 13 to 20% of fresh ear weight is for human use (Aekatasanawan 2001).

Baby corn is dehusked maize ear, harvested young especially when the silk have either not emerged or just emerged and no fertilization has taken place or we can say the shank with unpollinated silk is baby corn. Baby corn ears in light yellow colour with regular row arrangement, 10 to 12 cm long and a diameter of 1.0 to 1.5 cm arrangement are preferred in the market (Golada *et al*., 2013). Baby corn is an important crop of Thailand, Taiwan and India; Recently, baby corn has gained popularity as valuable vegetable in Delhi, Uttar Pradesh, Haryana, Maharashtra, Karnataka, Andhra Pradesh, Rajasthan and Meghalaya States of India. In India, it is grown on 9.43 m ha area with the production and productivity of 24.35 m t and 2583 kg ha-1, respectively (FAO, 2014). Baby corn production being a recent development has proved

enormously successful in countries like Thailand, Taiwan, Sri Lanka and Myanmar. The countries like Zambia, Zimbabwe and South Africa have also started cultivation. Today, Thailand and China are the world leaders in baby corn production. Attention is now being paid to explore its potential in India for earning foreign exchange besides higher economic returns to the farmers. Baby corn cultivation is now picking up in Meghalaya, Western Uttar Pradesh, Haryana, Maharastra, Karnataka and Andhra Pradesh (Kheibari *et al*., 2012).

Baby corn cultivation being a relatively new practice in India, requires the development of suitable production technology in realizing higher baby corn yield and monetary returns before it could be popularized among maize growers. Baby corn crop owing to its more profitability than grain maize may be helpful in raising the income of the farmers (Pandey et al., 1998). Since genotypes, spacing and fertilizers are most important factors in agriculture and the information on these interaction effects with other inputs is rather limited. Keeping this background in mind, the present study on Effect of different schedules and fertilizer (Organic and Inorganic) of Baby Corn on corn yield, grain yield and economic profit value with the following objectives:

1. To study the effect of plant densities on potentiality of baby corn genotypes at different fertilizer doses.
2. To study the quality parameters of baby corn genotypes
3. To ascertain economics of baby corn production

REVIEW OF LITERATURE

Thavaprakaash N., Velayudham K. and Muthukumar V.B. (2005) revealed that the correlation between NPK uptake and baby corn yield was positive and significant during both the seasons and with BEY.

Thavaprakaash N., Velayudham K. and Muthukumar V.B. (2005) perceived that substitution of 50 per cent NPK through either poultry or goat manures along with Azospirillum and phosphobacteria had significant influence on the growth and yield parameters and also yield levels of cob and fodder of baby corn. Yield levels of intercrops were higher under closer row geometry (45 cm) than 60 cm spacing. INM practices had less influence on intercrops yield. Whereas, baby corn equivalent yields were higher at 60 cm row spacing, intercropped baby corn with N_3 and N_4 than the rest.

Thavaprakaash N. and Velayudham K. (2007) revealed that the correlation between NPK uptake and baby corn yields was positive and significant however between BEY and nutrient uptake was not significant during kharif and summer season.

Fakir M.S.A. and Islam M.A. (2008) concludes that an optimum density of 10 plants/m2 for baby corn yield (c. 7.0 t/ha) was observed in the both varieties under Mymensingh condition (24°75′N 90°50′E).

Rani et al. (2011) perceived that out of all the cultivars tested VL-78 recorded significantly higher baby corns plant⁻¹ (2.92), more green ear weight (23.3 g), harvest duration (25.2 days), baby corn yield (5511 kg ha⁻¹), N and K uptake, also net returns (…36693 ha⁻¹) and B:C ratio (2.5). Significantly higher net returns were obtained by cultivar VL-78 with combined application of 75% N through fertilizer + 25% N through Neem cake.

Neupane M.P. and Mahajan Gaurav (2012) revealed that 75% N through urea + 25% N through FYM (N2) and spacing of 40 cm × 15 cm (S1) were found best source of nitrogen and spacing, respectively and their combination N2S1 (75% N through urea + 25% N through FYM + 40 cm × 15 cm spacing) emerged superior over all other treatment combinations in relation to growth, yield attribute and yield for commercial cultivation of baby corn under agro- climatic conditions of Varanasi.

Wailare Auwal Tukur (2012) recorded that substitution of some portion of chemical fertilizers along with either organic manure or biofertilizer will maintain and sustains soil health as well as improving economic stability of farmers.

Lone Ajad A, Allai B.A. and Nehvi F.A. (2013) concluded that cultivation of baby corn variety VL-78 under temperate conditions with an application of N:P:K at 90N:60P:40K, kg/ha in combination with 6 T/ha FYM revealed a maximum B:C ratio of 1:1.59.With 703 $/ha as cost of cultivation, the estimated gross returns from the cultivation practice were to the tune of 1825 $ giving a benefit of 1123 $/ha.

Ranjan *et al.* (2013) noticed that biofertilizers significantly increased yield and yield attributing characters. The best treatment identified was Vermicompost (1.92 kg/bed) + Biospirillum (10ml/kg of seed) + Biophos (10ml/kg of seed) + biopotash (10ml/kg of seed) where yield of baby corn was recorded 18.57 q/ha. This treatment also showed increase in leaf chlorophyll content.

Mahadevaiah K. and Sagar G. Karuna (2013) revealed that the cob green fodder yield, uptake of nutrients, net returns and benefit cost:ratio were highest with pre-emergence application of atrazine + one intercultivation at 30 DAS. The weedy check registered highest nitrogen, phosphorus and potassium uptake by weeds.

Golada S.L., Sharma G.L. and Jain H.K. (2013) revealed that application of nitrogen up to 90 kg ha-1 level significantly increased green cob yield and baby corn yield in tune of 20.5 and 23.6% as compared to 60 kg N ha-1. The mepiquat chloride at 200 ppm exhibited highest yield parameters viz. cob length, cob girth, cob weight, corn length, corn girth, corn weight and cobs plant-1 . The crop sprayed with mepiquat chloride produced highest green cob yield (5903 kg ha-1), baby corn yield (2083 kg ha-1) and this was comparable with application of NAA. In case of green fodder yield, NAA at 40 ppm produced significantly highest green fodder yield (26.9 t ha-1) over mepiquat chloride at 200 ppm (22.1 t ha-1).

Sarjamei Farid, Khorasani Saied Khavari and Nezhad Ahmad Jafar (2014) noticed that leaves number above ear, ear leaf length and diameter, fresh stalk weight and diameter affected by interaction between plant density and planting method respectively. D3 produced the highest de husked ear yield by ndmean of 1969 kg/h. Ear yield did not affected by planting method.

Bairagi et al. (2015) perceived that the growth and yield parameters of baby corn were clearly indicative that they were thermo- sensitive and baby corn cobs and fodder yield are higher at closer spacing.

Srichandan S., Mangaraj A.K. and Mohanty Anita (2015) found that Regarding interaction of N content of baby corn, N content of green fodder, N uptake of baby corn and N uptake of green fodder it is maximum at 90 kg N/ha and S4. Protein percentage of baby corn is highest at interaction of 90 kg N/ha and S4 i.e, 19.03%. B: C was highest at 90 kg N/ha (5.32) and S4 (5.18).

Singh et al. (2015) recorded that variety HM 4 sown on 30th October at 45×25 cm spacing resulted in maximum gross return, net return and benefit cost ratio.

Roy *et al.* (2015) observed that the maintenance of optimum moisture as well as integrated nutrient management is ideal for growing summer baby corn in West Bengal.

Shivran *et al.* (2015) discerned that application of fertilizer and vermicompost in 50:50 per cent proportion registered higher availability of N, P and K in soil after harvest.

Scaria *et al.* (2016) concluded that the baby corn variety G-5414 and a spacing of 45 x 20 cm were found to be superior for intercropping in coconut garden. In terms of yield and

economic returns, maize hybrid CO-6 also performed well when cultivated as intercrop in coconut garden.

Ravichandran *et al.* (2016) observed that among the integrated nitrogen management practices, application of 100% recommended dose of fertilizer N and 12.5 t of FYM enhanced plant population and integrated nitrogen management on yield and quality of baby corn at 60 DAS of observation during the Kharif and Rabi seasons. Higher husked baby corn and fodder yield were produced in higher plant population combined with 100% RDF N and 12.5 t ha-1 FYM during the Kharif and Rabi seasons.

Ghosh *et al.* (2017) found that baby corn grown at a density of 1,00,000 plants/ha under high fertility (100-50-50 kg N-P2O5-K2O/ha) level performed better than under other treatment combinations under the lateritic soil of eastern India.

Rekha *et al*. (2017) revealed that post-harvest soil fertility in terms of available nutrients was significantly higher under sole baby corn and among nitrogen management practices, with application of 50% RDN through goat manure + 50% RDN through poultry manure.

Kumar *et al.* (2017) observed that the application of 120 kg N ha-1 reduced the days to corn initiation but prolonged the harvesting period over 80 kg N ha-1. Application of 30 kg P ha-1 is reported to be beneficial and economical for baby corn production under the normal management. Potassium regulates the osmotic potential of cells and imparts resistance to biotic and abiotic stresses. Application of S and Zn has resulted in significant improvement for crude protein, Ca, ash in baby corn. Application of 125% RDF (187.5-93.7-75 kg ha-1) and 50 kg S ha-1 along with 10 kg Zn ha-1 has great impact on corn production in maximizing corn yield, fodder yield, nutrient content and monetary returns to the growers.

Chamroy *et al*. (2017) observed that treatment combinations P2S3 (last week Sept. + 45 × 30 cm) exhibited highest number of leaves plant-1 (13.63), leaf area (512.62 cm2) and LAI (3.62). Whereas the treatment combination P2S2 (last week Sept. + 45 × 15 cm) gives highest plant height (205.47 cm). The yield and yield attributing characters such as, number of cobs plant-1(3.43), cob weight (9.87 g)cob yield plant-1 (31.64 g) were found highest in P2S5 (last week Sept. + 60 × 30 cm). However, P2S2 (last week Sept. + 45 × 15 cm) exhibited highest yield hectare-1 (81.10 q).

Chand *et al*. (2017) concluded that increment of zinc application correspondingly improved yield and yield attributes as well as gross returns, net returns and B:C ratio of baby corn.

Neupane *et al*. (2017) discerned that HM-4 be grown using RDN 50% as B, 25% at knee height stage, 20% at tassel emergence followed by 5% foliar spray after first picking as urea solution (3%) for achieving higher yield and net returns.

Bhushan Ayush and Khare Neelam (2018) recorded that spacing pattern of 55x25 gave best results in both varieties in the treatments investigated; organic manure in the form of vermicompost was used in all the treatments. It is interesting to know that spacing pattern of 65x25 gave the worst performance in both the varieties.

MATERIAL AND METHODS

Technical programme

A. **Research topic:-** Effect of different schedules and fertilizer (Organic and Inorganic) of Baby Corn on corn yield, grain yield and economic profit value.

B. **Location:** The experiment conducted on agriculture research farm, Lovely Professional University, Phagwara

C. Experimental details:

1. Year of experiment : 2017-2018
2. Recommended dose of fertilizer : 60:60:40 kg N,P,K/hec
3. No. of treatments : 10
4. No. of replication : 4
5. Total no. of plots : 40
6. Plot size : 6m x 4m
7. Dates of sowing : June 2018
8. Experiment design : Randomized complete block design (RCBD)
9. Crop and variety : Baby corn and Parkash
10. Estimated area needed : 1080m^2

D) Treatment details

Treatment	**Details**
T_1 (30×20) Spacing	Control
T_2	100% N
T_3	75% N + 25% FYM
T_4	50% N + 50% FYM
T_5	100% FYM
T_6 (45×15) Spacing	Control
T_7	100% N
T_8	75% N + 25% FYM
T_9	50% N + 50% FYM
T_{10}	100% FYM

E. Collection of sample:

Soil sample will be taken for analysis to check soil status (pH, N, P, EC and Organic carbon) of experimental field before crop season.

Analytical method to be followed during investigation are as under

Sr. No.	Parameters	Method	References
1	pH(1:2.5)	Glass electrode	Spark (1996)
2	EC(1:2.5)	Conductivity meter	Spark (1996)
3	Organic carbon	Wet digestion	Walkely and Black (1934)
4	Available N	Alkaline potassium permagnate method	Subbiah and Asija (1956)
5	Available P	Oslen method	Oslen *et al*. (1954)
6	Available K	Flame photometer	Jackson (1973)

F) Observations to be recorded:

Observation will be recorded at 15, 30, 45 and 60 days.

1. Cob length
2. Cob girth
3. No. of cobs per plant
4. No. of kernals per cob
5. Fresh weight of cob
6. Dry weight of cob
7. Green cob yield
8. Green fodder yield

G) Statistical Analysis:

The data will be statistically analysed by using ANOVA of randomized complete block design and Perse information.

LAYOUT

R1		R2	R3		R4
T1		T3	T10		T5
T2		T1	T8		T10
T3	**C**	T2	T5	**C**	T4
T4	**H**	T5	T3	**H**	T1
T5	**A**	T7	T6	**A**	T9
T6	**N**	T8	T9	**N**	T2
T7	**N**	T10	T4	**N**	T6
T8	**E**	T6	T7	**E**	T3
T9	**L**	T4	T1	**L**	T8
T10		T9	T2		T7

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