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Effect of Sowing Schedules and Varieties on Productivity and Economics of Baby Corn *(Zea mays)*

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Abstract A field experiment was carried out on Research Farm of SKUAST-J, Chatha during summer season of 2011 to study the effect of sowing schedules and varieties on growth, yield and economics of baby corn *(Zea mays)*. Experiment was laid out in split plot design and replicated thrice with four sowing schedules (31st March, 15th April, 30th April and 15th May) allotted to main-plots and three varieties (VL-1, Prakash and Punjab Sathi)allotted to sub-plots. The experimental results revealed that among various sowing schedules, sowing done on 31th March recorded significantly higher baby corn yield (2167.70 kg ha^{-1}) than other sowing schedules with a benefit cost ratio of 2.76. Among varieties, VL-1 produced significantly higher baby corn yield (2101.92 kg ha^{-1})with benefit cost ratio of 2.69 followed by Prakash and Punjab Sathi. Growth parameters and yield attributes were also significantly affected due to sowing schedules. Dry matter accumulation, number of baby corns per plant, baby corn length and baby corn weight followed the trend same as baby corn yield i.e. 31th March, sowing schedule remained superior than other three (15th April, 30th April and 15th May) schedules. Succeeding sowing schedules from 31th March to 15th April showed significant reduction in baby corn yield.

Keywords Baby corn, Economics, Growth, Sowing schedules, Varieties.

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Introduction

Maize *(Zea mays)* is one of the most versatile crops having wide adaptability under varied agro-climatic conditions. In India maize is cultivated over an area of 9.43 m ha with production of 24.35 million tonnes and productivity of 25.83 q ha^{-1} while in Jammu and Kashmir it is cultivated over an area of 0.31 m ha^{-1} with production and productivity of 0.63 million tonnes and 21 q ha^{-1}, respectively [1]. Since long maize had been cultivated for grain and fodder purpose. During the recent times, it has extended its potentiality into the field of vegetable production. The corn ear used as vegetable for cooking purpose is popularly known as baby corn. Baby corn is dehusked maize ear, harvested young especially when the silk have either not emerged or just emerged and no fertilization has taken. Baby corn ears in light yellow color, 10to 12 cm long and a diameter of 1.0 to 1.5 cm arrangement are preferred in the market [2]. Baby corn is an important crop of Thailand, Taiwan and India; India has emerged as one of the potential baby corn

producing country because of the low cost of production as compared to many other countries. Sowing date and variety are very important parameters in crop production. Most of the agronomic requirements of baby corn are similar to grain maize, however, for successful production of baby corn, sowing at appropriate date and selection of suitable varieties need to be studied under local agro-climatic conditions.

Various researchers have reported that maize sown in July was found unsuitable for baby corn production because growing conditions like reduced moisture and high temperature resulted in poor seed germination and growth [3]. The optimum sowing date and suitable variety paves the way for better-use of time, light, temperature, precipitation and other factors. The efforts of this experiment will also help to provide clear guidance to farmers to find out the best combination of sowing date and variety for sub-tropical belt of Jammu division. The trial also assesses the loss in yield due to straying from those dates so keeping all these facts in view, the present study was planned and undertaken.

Materials and Methods

Field experiment was conducted at Agronomy Research Farm, SKUAST-J, Chatha, Jammu during summer 2011, the total rainfall of 244.0 mm was received during the entire crop growth period. The weekly mean maximum and minimum temperatures during crop growth period ranged from 12.5 to 41.3 ^{0}C, respectively. The mean minimum temperature of 12.5 ^{0}C was recorded in the 14th standard week and mean maximum temperature of 41.3 ^{0}C was noted in the 20th standard week during crop growth. The soil of the experimental site was sandy clay loam in texture, slightly alkaline in reaction (7.96) with EC in safe range (0.30 dSm^{-1}), low in organic carbon (3.6 g kg^{-1}) and nitrogen (238.23 kg ha^{-1}) and medium in phosphorus (12.50 kg ha^{-1}) and potassium (140.33 kg ha^{-1}). The experiment was laid out in split-plot design with three replications comprising of twelve treatment combination with four sowing schedules (31st March, 15th April, 30th April and 15th May) allotted to mainplots and three varieties (VL-1, Prakash and Punjab Sathi) allotted to sub-plots. The field was laid out manually. Crop was uniformly fertilized with recommended dose of N (120 kg ha^{-1}), P_2O_5 (60 kg ha^{-1}) and K_2O (40 kg ha^{-1}) using urea, DAP and MOP as fertilizer sources of N, P and K. Half of the total N and full P and K fertilizers were applied as basal dose. Remaining N was top-dressed in two equal splits, first at 30 days after sowing coinciding with knee high stage and second at the time of tasseling. All the agronomic practices were followed throughout the cropping period.

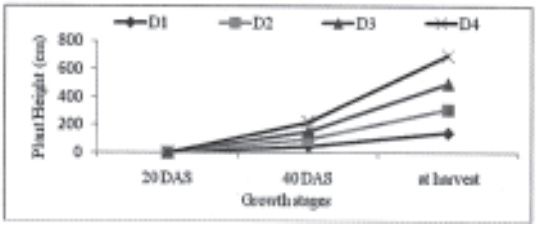

Fig. 1. Effect of sowing schedules on plant height of baby corn.

Results and Discussion

Effect of sowing schedules on growth

Plant height is an index of plant growth and offers an immediate comparison of different treatments (Fig. 1). At 20 and 40 DAS and at harvest maximum plant height of 24.02, 67.73 and 200.72 cm respectively, was recorded in crop sown on 15th May which might be due to the increase in temperature in later sowing schedules which resulted photosynthates to divert towards height instead of cobs. Similar results were also reported by Williams [4]. Whereas, dry matter accumulation recorded at various growth stages (20 and 40 DAS and at harvest) marked trend opposite to that of plant height. Plants of 31st March sown crop were relatively smaller in height but resulted in higher dry matter accumulation than later sowing schedules. Baby corn sown on later schedules experienced high temperature during later stages, which resulted in quick desiccation of leaves, unbalanced ratio of photosynthesis and respiration which ultimately resulted in low dry matter accumulation. These results are accordance with those earlier [4, 5].

The results regarding cob initiation revealed that with each succeeding sowing schedule from 31st

Table 1. Effect of sowing schedules and varieties on baby corn growth.

Treatments	Plant height (cm) at harvest	DMA (g plant^{-1}) at harvest	Days taken to tassel initiation	Days taken to cob initiation
Sowing schedules				
31st Mar	144.38	91.05	58.65	58.65
15th Apr	167.09	84.94	53.00	53.00
30th Apr	187.09	76.54	50.15	50.15
15th May	200.72	70.83	45.31	45.31
CD (p=0.05)	7.08	3.36	2.44	2.44
Varieties				
VL-1	197.90	88.69	53.28	53.28
Punjab Sathi	142.37	71.16	47.75	47.75
Prakash	184.20	82.66	54.30	54.30
CD (p=0.05)	3.56	1.23	1.42	1.42

March to 15th May, crop took significantly lesser time for cob initiation. Crop sown on 31st March took 58.65 days for cob initiation (Table 1). This was mainly due to difference in photoperios and temperature prevailing during various sowing schedules. Similar findings were also reported by Khan et al. [6].

Effect of varieties on growth

Among the different baby corn varieties, taller plants were observed in variety VL-1 followed by Prakash and Punjab Sathi (Fig. 2). A similar trend was observed in dry matter accumulation (Table 1). Significant variation in three varieties at different growth stages was due to the expression of the genetic characters which were exclusively dependent on the genetic constitution of varieties.

Regarding days taken to cob initiation VL-1 and Prakash took almost similar days for cob initiation but remained superior over Punjab Sathi (Table 1). Difference in cob initiation was correlated with maturity of genotypes. These results were also supported by Khan et al. [7].

Table 2. Effect of sowing schedules and varieties on yield attributes, yield and economics of baby corn. *Price of baby corn was Rs 50 per kg and green fodder was Rs 100 per qtl for 2011.

Treatments	Cob length (cm)	Cob per plant	Cob weight (g)	Cob yield (kg ha^{-1})	Stover yield (kg ha^{-1})	Net returns (Rs ha^{-1})	B : C ratio
Sowing sehedules							
31st Mar	9.88	2.83	9.24	2167.69	7082.29	87596.02	2.76
15th Apr	8.97	2.56	8.33	1827.67	6106.43	68885.92	2.17
30th Apr	7.68	2.22	7.63	1439.04	4991.06	48270.27	1.56
15th May	7.07	1.88	6.86	977.04	3665.17	22846.27	0.73
CD (p=0.05)	0.33	0.24	0.35	179.63	515.51		
Varieties							
VL-1	8.94	2.89	8.56	2101.92	6893.53	84361.67	2.69
Punjab Sathi	7.70	1.70	7.31	1054.01	3886.02	26696.57	0.85
Prakash	8.57	2.53	8.18	1652.65	5604.16	59639.82	1.90
CD (p=0.05)	0.60	0.18	0.26	141.24	405.35		

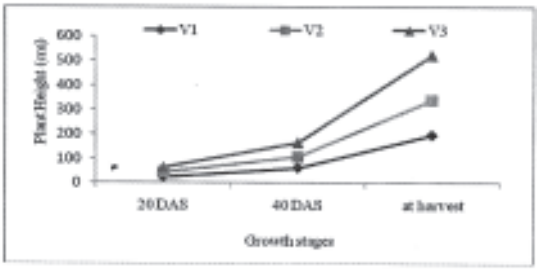

Fig. 2. Effect of varieties on plant height of baby corn.

Effect of sowing schedules on yield attributes, yield and economics

Sowing schedules had significant impact on yield attributes of baby corn as presented in (Table 2). Significant improvement in cobs per plant and cob weight was observed when the crop was sown on 31st March. It may be due to the suitable temperature under 31st March sown crop which caused general improvement in growth and development of plants with proper supply of photosynthates which favored the cob formation. Similar results were also reported by Kolawole and Samson [8].

An increase in cob yield and stover yield of baby corn sown on 31st March may be because of significant improvement of yield attributes under favorable atmospheric conditions. Higher yield obtained under 31st March sowing schedule as presented in Figure 3, was attributed to more days to maturity, extended growth and development period. Increase in cob yield and stover yield of baby corn with early sowing schedules was also reported by Pandey [9]. It was also found that crop sown on 31st March gave highest returns as well as benefit cost ratio. This was due to higher cob yield and stover yield obtained on 31st March.

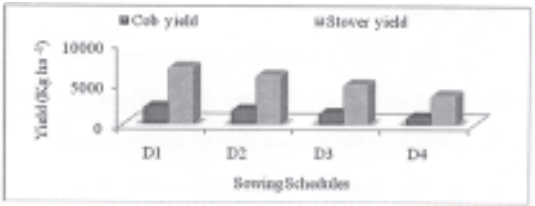

Fig. 3. Effect of sowing schedules on cob and stover yield.

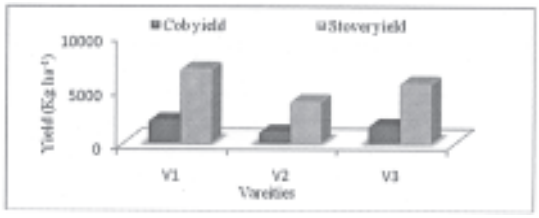

Fig. 4. Effect of varieties on cob and stover yield.

Effect of varieties on yield attributes, yield and economics

Among the three varieties evaluated, VL-1 proved more remunerative followed by Prakash and Punjab Sathi. VL-1 produced more number of cobs plant per plant (2.89) as well as higher cob weight (8.56 g) followed by Prakash and Punjab Sathi. Significant differences in respect of cob length and cobs plant per plant may be due to the growth characters of the varieties and genetic makeup of the genotypes.

Statistically higher cob and stover yield was also recorded in variety VL-1 which may due to the effect of superior attributing character which ultimately resulted in higher cob yield (2101.92 kg ha^{-1}) and stover yield (6893.53 kg ha^{-1}) as tabulated in Table 2 and presented Figure 4. Singh et al. [10] also obtained similar results. Higher net returns of 84, 361.67 Rs ha^{-1} and benefit cost ratio of 2.69 was obtained from variety VL-1.

Conclusion

Sowing on 31st March resulted in baby corn yield of 2,167.69 kg ha^{-1} which proved significantly superiority over 15th April, 30th April and 15th May. Among the tested varieties, VL-1 was the most promising variety because of its higher baby corn yield of 2,101.92 kg ha^{-1} over Prakash and Punjab Sathi. 31st March was the most suitable sowing time for baby corn for achieving economic yield advantage from baby corn variety VL-1 with a benefit cost ratio of 2.69. Hence,

31st March sowing schedule proved to be better option for sub-tropical conditions of Jammu.

References

1. Anonymous (2014) Agriculture statistics at a glance, Directorate of economics and statistics, department of agriculture and cooperation, ministry of agriculture, ministry of agriculture, GOI.
2. Golada SL, Sharma GL, Jain HK (2013) Performance of baby corn (*Zea mays* L.) as influenced by spacing, nitrogen fertilization and plant growth regulators under sub humid condition in Rajasthan, India. Afr J Agric Res 8 : 1100—1107.
3. Kotch RS, Murphy JH, Orzolek MD, Ferretti PA (1995) Factors affecting the production of baby corn. J Veg Crop Prod 1 :19—28.
4. Williams MM (2008) Sweet corn growth and yield responses to planting dates of the North Central United States. Hort Sci 43 : 1775—1779.
5. Garcia AG, Guerra LG, Hoogenboom G (2009) Impact of planting date and hybrid on early growth of sweet corn. Agron J 101 : 193—200.
6. Khan ZH, Khalil SK, Khan MY, Israr M, Basir A (2011) Selecting optimum planting date for sweet corn in Peshawar. Sarhad J Agric 27 : 341—347.
7. Khan ZH, Khalil SK, Nigar S, Khalil I, Ha1 I, Ahmad, A Ali, Khan MY (2009) Phenology and yield of sweet corn landraces influenced by planting dates. Sarhad J Agric 25 : 153—157.
8. Kolawole E, Samson U (2009) Growth and yield of maize as influenced by sowing date and poultry manure application. Not Bot Hort Agrobot Cluj Napoca 37 : 199—203.
9. Pandey AK (2004) Production potential and economics of different sowing dates for baby corn *(Zea mays)* production under mid-hill conditions of North-Western Himalayas. Ind J Agron 49 : 179—181.
10. Singh Ganesh, Kumar Satish, Singh R, Singh SS (2015) Growth and yield of baby corn (*Zea Mays* L.) as influenced by varieties, spacings and dates of sowing. Ind J Agric Res 49 : 353—357.