



RESEARCH ARTICLE

EFFECT OF SOWING DATES ON PLANT GROWTH AND YIELD OF HYBRID SWEET CORN

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ABSTRACT

The study was conducted at Tansa Farm, ASPEE Agricultural Research and Development Foundation, Maharashtra during 2015-16. The four sowing dates viz. 15th December, 30th December, 15th January, 30th January and three hybrid sweet corn varieties viz. Hibrix 39, Madhu 5 and Sugar 75 was studied. The experiment was laid out in Randomized Block Design (RBD) with three replications having net plot size 6.6 m x 4.5 m. Yield components and plant growth parameters such as plant height, cob length, cob weight, seeds per cob, test weight and grain yield of sweet corn varieties were significantly affected by different sowing dates. All quantity traits were promising when the sowing was carried out on 15th December. Further delay of the sowing had negative effects on the performance of quantity of sweet corn varieties. Hybrid sweet corn var. Sugar 75 was recorded promising variety which gave higher grain yield of 2381 kg ha⁻¹.

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INTRODUCTION

Maize (*Zea mays* L.) is the third most important food grain crop after wheat and rice. Maize growers are shifting to specialty corn production due to higher returns and also opening opportunities for employment generation specially in urban areas. Among specialty corns, sweet corn has a very big market potential and has great genetic variability and scope to improve its nutritive value. It is grown extensively in temperate, tropical and sub-tropical regions of the world. Maize grain is valuable source of protein (10.4%), fat (4.5%), starch (71.8%), vitamins and minerals like calcium, phosphorous and sulfur (Shah, 2007). It also provides raw materials to starch industry and is used in the preparation of many products. India is the seventh largest producer of maize in an area of 8.11 mha with a production of 18.9 mt and 2335 kg ha⁻¹ productivity. Planting date and variety selection, including soil fertility, temperature regimes and irrigation are the major factors affecting Sweet corn production and productivity (Ramankutty et al., 2002). For optimization of yield, planting at the appropriate time is very critical as delay in planting date can lead to a linear decrease in grain yields (Anapalli et al., 2005). They further contended that early planting in the spring is optimum and more efficient than delayed planting as through early planting germination occurs when days are longer and

sun shines impact is more by way of an acute angle; whereas delaying planting date results in decrease in maize grain yields. Farmer's choice on improved varieties is one of the most crucial factors affecting the productivity of a crop. High yielding varieties are of primary importance for potential yield positively. Yield can be increased to a greater extent through high yielding varieties and appropriate time of sowing, with advanced agronomic practices (Qureshi et al., 2007). Therefore, it was felt necessary to conduct this experiment for determination of appropriate time of sowing of newly introduced sweet corn hybrids and their performance under North Konkan Coastal zone of Maharashtra.

MATERIALS AND METHODS

The experiment was conducted at ASPEE Agricultural Research and Development Foundation Farm, Village- Nare, Taluka- Wada, District- Palghar during the early *rabi* season of 2015-16. The tested varieties are Hibrix 39, Madhu 5 and Sugar 75. Twelve treatment combinations of three sweet corn varieties (Hibrix 39, Madhu 5 and Sugar 75) and four planting dates (15th December, 30th December, 15th January and 30th January), were tried in randomized block design with factorial concept in three replications. Each treatment was imposed in a plot size of 6.6 m x 4.5 m. Entire dose of phosphorous and potassium along with half of the nitrogen as per the recommended dose 120:60:40 kg NPK ha⁻¹ was applied as basal. The remaining half of the nitrogen was top dressed in

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two split doses at knee high stage and tasselling and silking stage of crop. Plant protection measures were taken as per the recommended schedule. Five plants were selected randomly from each treatment for recording observations on yield and yield components like plant height, cob length, cob weight, seeds per cob, test weight and grain yield per ha. Data were compiled and analyzed using appropriate statistical methods.

RESULTS AND DISCUSSION

Plant height of various hybrid sweet corn varieties varied significantly due to sowing dates (Table 1). The maximum height plant⁻¹ (170.8 cm) was noted in Sugar-75 sown on 15th December. The early sowing had significant effect on plant stature, where plants with increased height were obtained by sowing maize earlier as compared to late planting. Sarvari *et al.* (2007) Abdel-Rahman *et al.* (2001) also confirmed the same findings in maize. A significant influence of sowing dates was observed on cob length of various sweet corn varieties. Maximum cob length (20.5 cm) was noted in Sugar-75 sown on 15th December and which was at par with Hibrix-39 sown on the same date. However, the lowest cob length (19.8 cm) was recorded in Madhu-5. It is observed that hybrid sweet corn variety Sugar-75 gave maximum cob weight than other varieties (Table 1).

Table 1. Effect of different dates of sowing on plant growth parameters and yield of different sweet corn hybrids

Treatments	Plant height (cm)	Cob length (cm)	Cob weight (g)	Seed per cob	Test weight (g)	Seed yield (kg ha ⁻¹)
Sowing date						
15/12/2015	170.8	20.5	227.0	341.6	25.8	2412
30/12/2015	168.0	19.8	223.7	338.2	25.1	2341
15/01/2016	167.3	20.0	223.2	337.5	25.3	2362
30/01/2016	167.0	19.7	222.7	337.3	24.9	2325
C.D. (P=0.05)	1.0	0.5	1.2	6.2	0.6	150.7
Varieties						
Hibrix-39	168.4	20.0	224.1	338.6	25.3	2364
Madhu-5	167.6	19.8	223.6	338.0	25.0	2335
Sugar-75	168.8	20.2	224.9	339.4	25.5	2381
C.D. (P=0.05)	0.8	0.3	1.0	5.4	0.5	130.5

The maximum cob weight (227.0) was observed with Sugar-75 sown on 15th December. The results are also similar to findings of Maryam *et al.* (2011) who reported delay planting reduces cob length and weight in corn. A significant variation in number of seed per cob of sweet corn varieties and sowing dates was observed; the hybrid variety sugar-75 proved to be most superior in bearing more numbers of seeds per cob (341.6) when sowing was done on 15th December. Similar findings also reported by Khan *et al.* (2009) who reported that delaying planting would lead to a lesser row number and less grain numbers in the rows. A significant variation in test weight of different sweet corn varieties was observed under various sowing dates. Maximum test weight (25.8 g) was recorded in Sugar-75 when sown on 15th December. However, minimum test weight (24.9 g) was noticed in Madhu-5 sown on 30 January. This indicates that the delay sowing of sweet corn after 15th December resulted decreased quantity of hybrid sweet corn grains. Environmental changes associated with different sowing dates (sunshine & temperature) have a modifying effect on growth and development of maize plants. In present study, it

was observed that maize hybrids gave highest grain yield, when planted in the third week of December. However when sowing was delayed, the reduction in crop yield became substantial. In case of maize varieties, the highest grain yield (2412 kg ha⁻¹) was obtained in Sugar-75 which may be due to its genetically superiority over the rest of varieties when sown on 15th December. For optimization of yield, sowing high yielding hybrids at the appropriate time is very critical. Our findings are in agreement with the findings of Annapalli *et al.* (2005) and Khan *et al.* (2009) according to whom the yield can be increased to a greater extent provided high yielding varieties are identified and sown at appropriate time.

Conclusion

It was concluded from the findings of present study that all quantitative traits were promising, when the sowing of hybrid maize varieties was completed up to 15th December. Delay in sowing adversely affected yield components which ultimately induced a significant decline in grain yield. However, Sugar-75 proved to be superior to other hybrids in the sense of all quantity contributing factors followed by Hibrix-39 and Madhu-5. It is, therefore suggested that maize Sugar-75 should be sown on 15th December to obtain higher grain yield.

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