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Response of sweet corn (*Zea mays* var. *saccharata* L.) to split application of nitrogen and harvesting schedule under South Saurashtra condition

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Abstract
An experiment was conducted during *rabi* season of 2019-20. The experiment was laid out in a split plot design with three replication. The main plots consisted of two varieties (V_1- Sugar- 75 and V_2- Sweet-16) and three split application of nitrogen (N_1- 50.0% N as basal + 50.0% N at knee height stage, N_2- 25.0% N as basal + 50.0% N at knee height stage + 25.0% N at tasseling stage and N_3- 33.3% N as basal + 33.3% N at knee height stage + 33.3% N at tasseling stage), whereas sub plot consisted of three harvesting schedule (T_1- 20 days after silking, T_2- 30 days after silking and T_3- 40 days after silking).
The results indicated that variety Sugar-75 recorded significantly higher values of plant height, number of leaves plant^{-1}, length of cob, weight of cob, green cob yield, fresh kernel yield, green fodder yield, gross and net realization**.** Whereas, variety Sweet-16 produced maximum girth of cob. N_1 recorded significantly higher values of plant height at 45 DAS and number of leaves plant^{-1}. Whereas, N_2 produced maximum plant height at 60 DAS and at harvest, number of internode, length of internode, dry matter accumulation, length of cob, weight of cob, fresh kernel weight cob^{-1}, green cob yield, fresh kernel yield, green fodder yield, higher gross and net realization. Girth of cob, weight of cob, fresh kernel weight cob^{-1}, green cob yield, fresh kernel yield and green fodder yield were found significantly higher when crop was harvested at 30 days after silking followed by 40 days after silking. Whereas, length of cob was found significantly higher when crop was harvested at 30 days after silking followed by 20 days after silking. Maximum gross realization (₹ 171062 ha^{-1}) and net realization (₹ 102070 ha^{-1}) along with higher B:C ratio of 2.48 were observed under harvesting at 30 days after silkig followed by harvesting at 40 days after silking. Interaction effect between varieties and split application of nitrogen were observed significant for length of cob. Interaction effect between varieties and harvesting schedule were obtained significant for length of cob. This study recommends the use of variety Sugar-75, split application of 25.0% N as basal + 50.0% N at knee height stage + 25.0% N at tasseling stage and harvest at 30 days after silking to produce the greatest sweet corn cob per hectare.

Keywords: Sweet, nitrogen, harvesting, schedule, South Saurashtra

Introduction
Maize (*Zea mays* L.) is an important and third most important cereal food crop of the world with highest production and productivity as compared to rice and wheat. Globally, maize is known as "Queen" of cereals because it has the highest genetic yield potential among the cereals. It is cultivated on nearly 150 million hectares in about 160 countries having wider diversity of soil, climate, biodiversity and management practices (Meena *et al.*, 2019) [15]. Maize contributing almost 9% to India's food basket and 5% to World's dietary energy supply as human food (Kumar *et al*., 2012) [12]. Its production has increased more than 12 times from a mere 1.73 million tons in 1950-51 to 21.73 million tons in 2010-11 and presently, it occupies 9.22 million hectare area with the mean yield of 2.92 t/ha (ASG, 2011) [6]. In India, production of maize is 21.81 million tonnes from 8.69 m ha with a productivity of 2509 kg ha^{-1}. Projected demand for maize production by 2050 in India is around 121 million tonnes (Amarasinghe and Singh, 2008) [4].
Sweet corn (*Zea mays* L.) is special type of corn used for table purpose. It is one of the most popular vegetables in USA, Europe and other advanced countries of the world. Approximately 40 per cent of such corn is frozen and the rest is canned while processing. Now-a-days sweet corn is becoming popular and is being cultivated in maize growing areas of India. Being a high value crop, there is growing demand for sweet corn in star hotels for soup making. The farmers dwelling at the outskirts of the cities can take up this crop for better profits. Added advantage of sweet corn is that after the harvest of green ears, the crop remains at green stage and it is fit

for feeding cattle as green fodder. Due to its short duration, it is finding place in different cropping systems. It has been tried in different low canopy crops like groundnut, green gram, black gram and high canopy crops like red gram of varying durations as intercrop and found most improved cultivars, adequate plant stand and optimum plant nutrition have the profound bearing on yield, nutrient uptake and quality characters of maize (Massey and Gaur, 2013) [14].

Emphasis needs to be given for early maturity varieties, considering the fact that many crops can be taken under the Indian conditions due to reasonably favourable weather across the year in most of the states. Thus, *kharif*, *rabi* and spring crop can be taken even for the normal field corn and this can certainly be extended/enlarged for sweet corn. The delay of the maize harvest may promote quantitative and qualitative losses to the grain yield, caused by physiological and morphological factors. The grain yield and seed quality are potentially higher when the harvest is carried out right after physiological maturity. However, when maize grains are stored in the field and harvested with less than 20% moisture content, they may lose weight due to respiration (Lauren *et al*., 2007). In addition, the removal of grain with low moisture from the field promotes mechanical damage at harvest. Keeping this in view, an experiment was planned to study the response of sweet corn *(Zea mays* var. *saccharata* L.*)* to split application of nitrogen and harvesting schedule under South Saurashtra condition at Instructional Farm, JAU, Junagadh.

Material and Methods

The field experiment was carried out during *Rabi* seasons of 2019-20 at Instructional Farm, College of Agriculture, Junagadh Agricultural University, Junagadh (Gujarat). The area is situated in southern part of Gujarat, which falls under South Saurashtra agro-climatic zone. It lies between the parallels of 20º51' N latitudes and 70º31' E longitudes with an average elevation of 83 meters above mean sea level.

The field experiment was carried out to study the response of sweet corn (*Zea mays* var. *saccharata* L.) to split application of nitrogen and harvesting schedule under South Saurashtra condition. The soil of experimental field was medium black in texture, medium in available nitrogen, phosphorus and potassium with slightly alkaline in reaction (pH 7.70). The net plot area of 4.00 m x 3.60 m. It consisted eighteen treatment combinations. The main plots consisted of two varieties (V_1- Sugar-75 and V_2- Sweet-16) and three split application of nitrogen (N_1- 50.0% N as basal + 50.0% N at knee height stage, N_2- 25.0% N as basal + 50.0% N at knee height stage + 25.0% N at tasseling stage and N_3- 33.3% N as basal + 33.3% N at knee height stage + 33.3% N at tasseling stage), whereas sub plot consisted of three harvesting schedule (T_1- 20 days after silking, T_2- 30 days after silking and T_3- 40 days after silking) were tested under split plot design with three replications. Sweet corn varieties (Sugar-75 and Sweet-16) was raised as per recommended package of practices. During the experimental period, no infestation of serious pests and diseases were observed. The recommended dose of fertilizer (RDF) for Sweet corn is @ 120-60-00 kg NPK/ha respectively. Uniform fertilizer dose of 60 kg P_2O_5 ha^{-1} was applied in the field. All P along with part of N, as per treatment, were applied as basal in the furrows. Urea (46% N) and Di-ammonium phosphate (46% P_2O_5) were used as source of nitrogen and phosphorus, respectively. Nitrogen was given in 3 splits as basal, at knee height stage and at tasseling stage.

Result and Discussion

Effect of varieties

Growth parameters

The results showed that between two sweet corn varieties, Sugar-75 produced significantly taller plants at harvest (213.4 cm) and recorded maximum number of leaves plant^{-1} at 60 DAS (12.5) and at harvest (16.0). Sweet corn varieties had no any significant effect on number of internodes plant^{-1}, length of internode and periodical dry matter accumulation plant^{-1} recorded at 30. 45, 60 DAS and at harvest had no any significant effect of sweet corn varieties (Table 2). Sweet corn varieties had non-significant influence on days to tasseling and silking (Table 3). These results are in conformity with the findings of those reported by Banotra *et al*. (2017) [7], Dekhane and Dumbre (2017) [9], Saleem *et al*. (2017) [22], Muhammad *et al*. (2018) [16], Nawaz *et al*. (2019) [17], Olaiya *et al*. (2020) [18] and Adhikari *et al*. (2021) [1].

Yield attributes and yield

Sweet corn variety Sugar-75 produced significantly longer cob (21.6 cm), weight of cob (240.1 g). Whereas, sweet corn variety Sweet-16 recorded maximum cob girth (28.5 cm).

Numerically highest number of kernel rows cob^{-1}, fresh kernel weight cob^{-1} and test weight were observed under sweet corn variety Sugar-75. The marked improvement in most of the yield components in Sugar-75 manifested increase in productivity in terms of green cob, fresh kernel and green fodder yields (Table 3). The significant increase in yield attributes in sweet corn variety Sugar-75 over variety Sweet-16 seems to be on account of overall improvement in growth as evidenced from higher values of growth parameters *viz*., plant height, number of leaves plant^{-1}, number and length of internode. It is well established fact that number and growth of yield components are outcome of complimentary interaction between vegetative and reproductive growth of the crop. The greater availability of photosynthates as evinced from higher biomass accumulation along with availability of nutrients particularly N, P and K in variety Sugar-75 might resulted in enhancing cob length, cob weight and number of kernel rows cob^{-1}. Besides this, greater availability of growth inputs has promoted test weight, fresh kernel weight cob^{-1} and kernel weight cob^{-1} in variety Sugar-75. The higher biomass accumulation and improvement in yield attributes resulted in improved green cob and green fodder yields of Sugar-75. The results of the present investigation are in close accordance with the findings of Riliang Gu *et al.* (2017) [20], Ahmad *et al.* (2018) [3], Muhammad *et al.* (2018) [16], Nawaz *et al.* (2019) [17], Olaiya *et al.* (2020) [18] and Adhikari *et al.* (2021) [1].

Effect of split application of nitrogen

Growth parameters

The results indicated that sweet corn fertilized with 25.0% N as basal + 50.0% N at knee height stage + 25.0% N at tasseling stage significantly improved various growth parameters *viz.*, plant height at 60 DAS and at harvest, while number of leaves plant^{-1} at 45, 60 DAS and at harvest recorded significantly maximum when crop was fertilized with 50.0% N as basal + 50.0% N at knee height stage than rest of the split application of nitrogen levels (Table 1). Number of internodes plant^{-1} at 60 DAS and at harvest, length of internode at 60 DAS and dry matter accumulation plant^{-1} at

45, 60 DAS and at harvest (Table 2) were noted maximum when sweet corn was fertilized N_2.

The concomitant effect of these improvements ultimately led to production of higher biomass by plant at harvest. Various levels of split application of nitrogen did not influenced plant population (Table 1), days to tasseling and silking (Table 3). The nutrients are harvestable plant parts and are mostly translocated from vegetative to reproductive parts. Thus, better nutritional environment in plants with the N_2 or N_3 application seems to have promoted plant height, number of leaves, number of internodes plant^{-1}, length of internode by way of active cell division and their elongation. The larger canopy development and plant height with the N_2 or N_3 application could be responsible for increased interception, absorption and utilization of radiant energy which in turn overall growth, photosynthesis and finally dry matter at successive growth stages. The more or less similar results were also reported by Adhikari *et al.* (2016) [2], Anjum *et al.* (2018) [5], Shrestha *et al.* (2018) [24], Gharge *et al.* (2020) [11], Olaiya *et al.* (2020) [18] and Adhikari *et al.* (2021) [1].

Yield attributes and yield

It is evident from results (Table 3) that fertilizing the sweet corn with N_2 improved yield attributes *viz.*, no. of cobs plant^{-1}, length of cob, girth of cob, cob weight, Number of kernel rows cob^{-1}, fresh kernel weight cob^{-1} and test weight consequently green cob yield, fresh kernel yield and green fodder yield. The results showed that various split application of nitrogen levels failed to produce significant variation in number of cobs plant^{-1}, girth of cob, number of kernel rows cob^{-1} and test weight (Table 3).

Marked increased in yield attributes of crop with the fertilizing the crop with N_2 appears to be on account of vigorous growth in individual plant as reflected by increasing plant height, no. of leaves, no. and length of internode, dry matter accumulation, length of cob, cob weight, kernel rows cob^{-1}, cob weight and fresh kernel weight cob$^{-1.}$ Besides these, increased uptake of N, P and K clearly suggests their better availability. These improvements seems to have facilitated plants to express their genetic capabilities for yield formation.

Split application of nitrogen as per crop requirement play an important role in different metabolic activities and in improving nutritional status of plant both in vegetative and reproductive parts. These improvements suggest greater availability of metabolites and nutrients synchronized to demand for growth and development of each reproductive structure. Thus, higher availability of all these inputs as evinced from plant height, no. of leaves plant^{-1}, no. and length of internode plant^{-1}, cob girth and length, dry matter accumulation, cob weight and kernel weight cob^{-1} demonstrate reduced competition of these between developing structure. Consequently improving functional activity of each reproductive structure.

Significant increase in green cob and fodder yields (Table 3) are due to split application of nitrogen could be ascribed to the fact that green cob and fodder yields are the function of several growth and yield components further affirms the role of growth and yield attributing characters in improving green cob and fodder yields.

It has been well emphasized that split application of nitrogen play an important role in improving these major aspects of yield determination, i.e., formation of vegetative structure for nutrient absorption, photosynthesis and strong sink length through development of reproductive structure and production of assimilates to fill economically improved sink. Thus, cumulative effect of split application of N seems to maintained balanced source-sink relation through improving both the events of crop development (vegetative and generative) ultimately resulted in increased green cob and fodder yields.

The significant increase in green fodder yield with the N_2 application seems to be its direct effect on dry matter production at successive stages by virtue of increased photosynthetic efficiency. While, indirect effect seems to be due to increase in plant height, no. of leaves plant^{-1}, no. and length of internode and dry matter production. Further, biological yield is a function of green cob and green fodder yields representing reproductive and vegetative growth of the crop. The potential effect of time of split application of nitrogen on both these characters mediated via increased photosynthesis efficiency and nutrient accumulation might have ultimately led to production of higher biological yield under split application of nitrogen. The results of present study indicated higher production of sweet corn with split application of nitrogen are in close conformity with findings of Zerihun and Feyisa Hailu (2017), Anjum *et al.* (2018) [5], Shrestha *et al.* (2018) [24], Umesh *et al.* (2018) [26], Olaiya *et al.* (2020) [18] and Adhikari *et al.* (2021) [1].

Effect of harvesting schedule

Growth parameters

The results on growth parameters showed that different harvesting schedule of sweet corn green cob failed to produce their significant effect on growth parameters *viz.*, plant height, number of leaves plant^{1} (Table 1), number of internodes plant^{-1}, length of internode, dry matter accumulation (Table 2) and days to tasseling and silking (Table 3). The results confirms the findings of Shaheb *et al.* (2009) [23], Panison *et al.* (2016) [19] and Riliang Gu *et al.* (2017) [20].

Yield attributes and yield

The harvesting schedule of sweet corn green cob had significant effect on yield attributes and yield. Amongst harvesting schedule, harvesting of sweet corn green cob 30 days after silking exert their significant effect on length of cob, cob girth, weight of cob, fresh kernel weight cob^{-1}, green cob yield, fresh kernel yield and green fodder yield (Table 3). Delayed harvest crop gets more time for photosynthesis, which reflected improvement in yield and yield attributes. In delayed harvest crop, more assimilates get accumulated in the plant system there by enhancing the yield of green cob and green fodder. Daynard *et al.* (1969) reported a linear relationship between kernel yield and duration of grain filling period. The length and girth of cob increased with time of harvest and length and girth of cob, weight of cob and fresh kernel weight cob^{-1} were at a plateau after 30 days of silking. The green cob yield and green fodder yield were in the same trend attaining optimum level with harvesting of sweet corn green cob 30 days after silking. These factors resulted in optimum yield of sweet corn green cob (12289 kg ha^{-1}) and green fodder yield (24084 kg ha^{-1}) with harvesting of crop 30 days after silking. Harvesting beyond this date did not significantly increase the yield which may be due to senescence of lower leaves. The more or less similar results were also reported by Shaheb *et al.* (2009) [23], Barary *et al.* (2014) [8], Panison *et al.* (2016) [19], Riliang Gu *et al.* (2017) [20] and Sahu (2018) [21].

Interaction effect

Fertilizing the sweet corn variety Sugar-75 with 25.0% N as basal + 50.0% N at knee height stage + 25.0% N at tasseling stage (V_1N_2) recorded maximum cob length (Table 4) and it was closely followed by treatment combination V_1N_3. Significantly maximum cob length (Table 5) was recorded when sweet corn variety Sugar-75 harvested 30 days after silking (V_1T_2) which was on par with treatment combination V_1T_1. Maximum fresh kernel and green fodder yield of 13463 and 28472 kg ha^{-1} was recorded (Table 7) when sweet corn variety Sugar-75 fertilized with 25.0% N as basal + 50.0% N at knee height stage + 25.0% N at tasseling stage ($V_1N_2T_2$). These results confirms the findings of Subaedah *et al.* (2021).

Economics

Economics play an important role in deciding the adoption of a particular treatment by the farmers. The gross and net realization as well as B: C ratio were calculated for sweet corn varieties, split application of nitrogen and harvesting schedules and results furnished in Table 6 and Table 7.

Growing of sweet corn variety Sugar-75 gave maximum gross and net realization of ₹ 169707 and ₹ 99008 ha^{-1} along with B:C ratio of 2.40. Minimum gross realization, net return and B:C ratio of ₹155231 ha^{-1}, ₹ 87948 ha^{-1} and 2.31, respectively were noted under sweet corn variety Sweet-16.

The economical evaluation of different levels of split application of nitrogen showed that sweet corn fertilized with 25.0% N as basal + 50.0% N at knee height stage + 25.0% N at tasseling stage registered maximum gross and net realization as well as B:C ratio of ₹172224 and ₹ 102948 ha^{-1} as well as 2.49, respectively. Minimum gross (₹152134 ha^{-1}) and net (₹83712 ha^{-1}) realization as well as B:C ratio of 2.22 were observed when sweet corn fertilized with 50.0% N as basal + 50.0% N at knee height stage.

Harvesting of green cobs of sweet corn 30 days after silking gave maximum gross realization (₹ 171062 ha^{-1}), net return (₹102070 ha^{-1}) along with B:C ratio of 2.48. While, minimum gross and net return as well as B:C ratio were noted when sweet corn green cobs were harvested 20 days after silking.

The data presented in Table 7 revealed that the maximum gross (₹191573 ha^{-1}) and net (₹ 120589 ha^{-1}) realization along with B:C ratio of 2.70 were obtained under treatment combination $V_1N_2T_2$ *i.e.* sweet corn variety Sugar-75 fertilized with 25.0% N as basal + 50.0% N at knee height stage + 25.0% N at tasseling stage and green cobs of sweet corn harvested 30 days after silking followed by treatment combination $V_2N_2T_2$ i.e. sweet corn variety Sweet-16 fertilized with 25.0% N as basal + 50.0% N at knee height stage + 25.0% N at tasseling stage and green cobs of sweet corn harvested 30 days after silking. These results on economics are in close vicinity with those obtained by Dhaka *et al.* (2014) [10], Adhikari *et al.* (2016) [2], Wadile *et al.* (2016) [27], Sahu (2018) [21], Shrestha *et al.* (2018) [24] and Adhikari *et al.* (2021) [1].

Table 1: Plant population, plant height and no. of leaves plant^{-1} as influenced by varieties, split application of nitrogen and harvesting schedule

Treatments	Plant population at (ha^{-1})		Plant height at (cm)				No. of leaves plant^{-1}			
	Initial	Harvest	30 DAS	45 DAS	60 DAS	Harvest	30 DAS	45 DAS	60 DAS	Harvest
Varieties -(V)										
V_1- Sugar-75	82206	81041	59.5	91.0	201.1	213.4	8.1	8.7	12.5	16.0
V_2- Sweet-16	81921	80756	57.9	85.9	200.0	201.1	8.1	8.5	11.9	15.4
S.Em.±	1401	1401	1.2	1.8	3.1	2.9	0.14	0.13	0.17	0.17
C.D. at 5%	NS	NS	NS	NS	NS	9.2	NS	NS	0.54	0.54
Split application of nitrogen - (N)										
N_1- 50.0% N as basal + 50.0% N at knee height stage	81341	80176	58.9	94.8	198.2	202.3	8.2	9.0	12.8	16.3
N_2- 25.0% N as basal + 50.0% N at knee height stage + 25.0% N at tasseling stage	82096	80931	57.3	82.2	210.1	217.8	7.9	8.4	11.9	15.4
N_3- 33.3% N as basal + 33.3% N at knee height stage + 33.3% N at tasseling stage	82753	81588	59.8	88.4	193.3	201.8	8.2	8.5	11.9	15.4
S.Em.±	1715	1715	1.4	2.2	3.8	3.6	0.17	0.16	0.21	0.21
C.D. at 5%	NS	NS	NS	6.9	12.1	11.2	NS	0.5	0.7	0.7
C.V. %	8.87	9.0	10.5	10.4	8.1	7.3	8.97	7.68	7.4	5.71
Harvesting schedule – (T)										
T_1- 20 days after silking (DAS)	82529	81364	58.3	89.0	202.3	207.4	8.1	8.7	12.4	15.9
T_2- 30 days after silking (DAS)	82336	81171	60.3	88.7	197.0	203.7	8.3	8.6	12.1	15.6
T_3- 40 days after silking (DAS)	81326	80161	57.4	87.7	202.2	210.7	7.9	8.6	12.1	15.6
S.Em. ±	1125	1125	1.2	2.1	3.5	3.4	0.16	0.14	0.17	0.17
C.D. at 5%	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
C.V. %	5.82	5.9	8.7	10.2	7.5	6.9	8.5	7.1	5.9	4.5
Significant interaction	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 2: No. of internodes plant-1, length of internode and dry matter accumulation plant-1 as influenced by varieties, split application of nitrogen and harvesting schedule

Treatments	No. of internodes plant-1 at				Length of internode at (cm)				Dry matter accumulation plant-1 (g) at			
	30 DAS	45 DAS	60 DAS	Harvest	30 DAS	45 DAS	60 DAS	Harvest	30 DAS	45 DAS	60 DAS	Harvest
Varieties -(V)												
V_1- Sugar-75	3.6	5.1	7.3	10.6	4.8	7.17	11.83	13.39	4.50	16.51	48.69	90.35
V_2- Sweet-16	3.4	4.9	7.2	10.5	4.8	7.10	11.61	13.12	4.28	16.28	52.35	86.69
S.Em.±	0.1	0.1	0.1	0.1	0.1	0.14	0.23	0.33	0.15	0.32	1.46	1.46
C.D. at 5%	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Split application of nitrogen - (N)												
N_1- 50.0% N as basal + 50.0% N at knee height stage	3.4	4.9	7.1	10.4	4.9	7.2	11.23	13.21	4.45	15.28	45.48	83.48
N_2- 25.0% N as basal + 50.0% N at knee height stage + 25.0% N at tasseling stage	3.3	4.8	7.6	11.0	4.6	6.96	12.38	13.32	4.28	17.18	53.86	91.86
N_3- 33.3% N as basal + 33.3% N at knee height stage + 33.3% N at tasseling stage	3.8	5.3	7.1	10.4	4.9	7.2	11.53	13.24	4.43	16.72	52.22	90.22
S.Em.±	0.1	0.1	0.1	0.2	0.2	0.17	0.28	0.41	0.18	0.39	1.79	1.79
C.D. at 5%	NS	NS	0.4	0.5	NS	NS	0.87	NS	NS	1.23	5.65	5.65
C.V.%	17.54	12.27	8.21	7.00	15.15	10.18	9.99	12.98	17.75	10.06	15.07	8.60
Harvesting schedule – (T)												
T_1- 20 days after silking (DAS)	3.6	5.1	7.2	10.5	4.8	7.1	11.92	13.09	4.46	15.89	51.01	89.01
T_2- 30 days after silking (DAS)	3.3	4.8	7.1	10.5	5.0	7.3	11.76	13.68	4.29	16.65	50.26	88.26
T_3- 40 days after silking (DAS)	3.6	5.1	7.4	10.8	4.6	6.9	11.48	13.00	4.42	16.64	50.28	88.28
S.Em. ±	0.1	0.1	0.1	0.2	0.2	0.16	0.26	0.28	0.12	0.38	1.32	1.32
C.D. at 5%	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
C.V. %	11.2	7.8	6.2	6.6	14.34	9.63	9.27	8.98	11.44	9.88	11.05	6.31
Significant interaction	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 3: Days to tasseling, days to silking, no. of cobs plant-1, length of cob, girth of cob, weight of cob, no. of kernel rows cob-1, fresh kernel weight cob-1, test weight of fresh kernel and green cob yield, fresh kernel yield and green fodder yield as influenced by varieties, split application of nitrogen and harvesting schedule

Treatments	Days to tasseling	Days to silking	No. of cobs plant-1	Length of cob (cm)	Girth of cob (cm)	Weight of cob (g)	No. of kernel rows cob-1	Fresh kernel weight cob-1 (g)	Test weight of fresh kernel (g)	Green cob yield (kg ha-1)	Fresh kernel yield (kg ha-1)	Green fodder yield (kg ha-1)
Varieties -(V)												
V_1- Sugar-75	56.38	61.03	1.1	21.6	19.5	240.1	16.9	154.5	31.17	12080	6547	24448.8
V_2- Sweet-16	55.41	60.06	1.1	19.7	28.5	225.7	16.7	151.2	30.28	11100	6014	22114.5
S.Em.±	0.78	1.21	0.02	0.33	0.26	2.87	0.34	3.03	0.59	307	164.7	512.37
C.D. at 5%	NS	NS	NS	1.04	0.82	9.04	NS	NS	NS	968	518.8	1614.51
Split application of nitrogen - (N)												
N_1- 50.0% N as basal + 50.0% N at knee height stage	54.59	59.24	1.0	19.5	18.9	227.5	16.8	153.1	29.12	10755	5880.4	22290.2
N_2- 25.0% N as basal + 50.0% N at knee height stage + 25.0% N at tasseling stage	56.11	60.76	1.1	21.2	19.2	241.6	16.8	160.2	31.96	12275	6782	24737.1
N_3- 33.3% N as basal + 33.3% N at knee height stage + 33.3% N at tasseling stage	56.98	61.63	1.1	21.1	19.0	229.6	16.8	145.2	31.09	11741	6180	22817.5
S.Em.±	0.95	1.49	0.03	0.41	0.32	3.51	0.41	3.71	0.72	376	201.7	627.52
C.D. at 5%	NS	NS	NS	1.28	NS	11.07	NS	11.69	NS	1185	635.4	1977.36
C.V.%	7.22	10.41	10.84	8.35	7.03	6.40	10.41	10.29	9.94	13.77	13.62	11.44
Harvesting schedule – (T)												
T_1- 20 days after silking (DAS)	55.88	60.53	1.1	20.3	18.6	227.7	16.6	147.8	29.68	11066	5996	21720.5
T_2- 30 days after silking (DAS)	56.87	61.52	1.1	21.3	19.9	242.2	17.1	160.4	31.24	12289	6665	24084.4
T_3- 40 days after silking (DAS)	54.93	59.58	1.1	20.2	18.6	228.8	16.6	150.3	31.25	11416	6181	24040.0
S.Em. ±	0.78	1.15	0.02	0.33	0.28	3.42	0.32	3.51	0.71	333	178.9	495.42
C.D. at 5%	NS	NS	NS	0.98	0.80	9.97	NS	10.24	NS	974	522.2	1446.04
C.V. %	5.96	8.03	8.90	6.89	6.13	6.22	8.04	9.74	9.83	12.22	12.09	9.03
Significant interaction	NS	NS	NS	VxN and VxH	NS	NS	NS	NS	NS	NS	NS	NS

Table 4: Interaction effect of variety and split application of nitrogen on length of cob (cm)

Split application of nitrogen \ Variety	V_1	V_2
N_1	19.62	19.38
N_2	23.12	19.31
N_3	21.99	20.29
S.Em. ±		0.57

C.D. at 5%	1.81
C.V.%	8.35

Table 5: Interaction effect of variety and harvesting schedule on length of cob (cm)

Harvesting schedule \ Variety	V_1	V_2
T_1	21.70	19.00
T_2	22.76	19.93
T_3	20.28	20.04
S.Em. ±		0.47
C.D. at 5%		1.38
C.V. %		6.89

Table 6: Mean gross and net realization along with benefit cost ratio of sweet corn as influenced by varieties, split application of nitrogen and harvesting schedule

Treatments	Yield (kg ha^{-1})		Gross return (₹ ha^{-1})	Total cost (₹ ha^{-1})	Net return (₹ha^{-1})	B: C ratio
	Cob	Fodder				
Variety -(V)						
V_1- Sugar-75	12081	24449	169707	70699	99008	2.40
V_2- Sweet-16	11100	22115	155231	67284	87948	2.31
Split application of nitrogen - (N)						
N_1- 50.0% N as basal + 50.0% N at knee height stage	10755	22290	152134	68422	83712	2.22
N_2- 25.0% N as basal + 50.0% N at knee height stage + 25.0% N at tasseling stage	12275	24737	172224	69276	102948	2.49
N_3- 33.3% N as basal + 33.3% N at knee height stage + 33.3% N at tasseling stage	11741	22818	163049	69276	93774	2.35
Harvesting schedule – (T)						
T_1- 20 days after silking (DAS)	11066	21721	154104	68991	85113	2.23
T_2- 30 days after silking (DAS)	12289	24084	171062	68991	102070	2.48
T_3- 40 days after silking (DAS)	11416	24040	162242	68991	93251	2.35

Table 7: Economics of sweet corn production as influenced by varieties, split application of nitrogen and harvesting schedule

Treatment Combinations	Yield (kg ha^{-1})		Gross return (₹ ha^{-1})	Total cost (₹ ha^{-1})	Net return (₹ ha^{-1})	B: C Ratio
	Fresh kernel	Green fodder				
$V_1N_1T_1$	9873	25231	149189	70130	79059	2.13
$V_1N_1T_2$	12009	19907	159906	70130	89777	2.28
$V_1N_1T_3$	10937	23976	157326	70130	87196	2.24
$V_1N_2T_1$	12831	25000	178309	70984	107325	2.51
$V_1N_2T_2$	13463	28472	191573	70984	120589	2.70
$V_1N_2T_3$	12981	26389	182591	70984	111608	2.57
$V_1N_3T_1$	12329	21759	166804	70984	95821	2.35
$V_1N_3T_2$	12153	24305	170138	70984	99154	2.40
$V_1N_3T_3$	12153	25000	171527	70984	100543	2.42
$V_2N_1T_1$	9722	18055	133332	66714	66618	2.00
$V_2N_1T_2$	11574	23286	162312	66714	95598	2.43
$V_2N_1T_3$	10417	23286	150738	66714	84024	2.26
$V_2N_2T_1$	11227	21991	156249	67568	88681	2.31
$V_2N_2T_2$	13194	23286	178516	67568	110947	2.64
$V_2N_2T_3$	9954	23286	146108	67568	78540	2.16
$V_2N_3T_1$	10417	18287	140740	67568	73172	2.08
$V_2N_3T_2$	11343	25250	163925	67568	96357	2.43
$V_2N_3T_3$	12055	22304	165163	67568	97595	2.44

Conclusion

On the basis of one year field experimentation, it seems quite logical to conclude that under clayey soil of South Saurashtra Agro-climatic zone for getting higher fresh kernel yield, green fodder yield, gross and net realization, variety Sugar-75 should be fertilised with nitrogen in three splits (25.0% N as basal + 50.0% N at knee height stage and 25.0% N at tasseling stage) and harvesting of green cobs of sweet corn 30 days after silking along with other recommended package of practices.

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