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EVALUATION OF SWEET CORN GENOTYPES FOR GREEN COB YIELD, FODDER YIELD AND AGRONOMIC TRAITS

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SUMMARY

A trial was conducted during *Kharif* 2022 to evaluate the performance of ten sweet corn entries against two checks (CMVL sweet corn 1 and Misthi) at CCS HAU Regional Research Station, Karnal. Ten sweet corn genotypes sown in Randomized Block Design (RBD) in a plot size of 8.4 m^2 (four rows of 3.5 m with row to row spacing 0.6 m) with three replications. Observations was recorded on traits namely days to 50% anthesis, days to 50% silking, ear number/ha, ear height (cm), plant height (cm), green cob yield with husk (kg/ha), green cob yield without husk (kg/ha), fodder yield (kg/ha) and total soluble solutes (%). The genotype CSCH 16027 (14,442 kg/ha) reported maximum green cob yield with husk, CSCH 16027 (11526 kg/ha) genotype recorded second highest green cob yield without husk, genotype MSCH 2101 (29604 kg/ha) reported maximum forage yield with >12 per cent heterosis over the best check and genotype CSCH 16027 was found to be at par with best check in terms of green cob yield without husk and also showed superiority in terms of forage yield against the best check.

Key words : Sweet corn, green cob yield, heterosis and forage yield

Maize (*Zea mays* L.) commonly known as corn is third most important cereal crop after wheat and rice and mainly grown for food, feed and industrial purpose across the world. Its grains are rich in starch, protein, fat, vitamins and mineral nutrients (Arya *et al.*, 2015; Kumar *et al.*, 2021). In the past corn was grown mainly for grain purposes but now it is grown for various purposes including food, feed, fodder and as raw material for industrial products (Arya *et al.*, 2020). Rice-wheat is the main cropping system in Haryana which has resulted in lower underground water table, poor soil fertility, development of resistance problem in weed (*Phalaris minor*). Thus, for a sustainable crop production and to avoid the depletion of natural resources, it is highly recommended to use crop rotation. Maize is the main crop which may play a crucial role in crop rotation. Despite of good efforts by Haryana Government, area under maize has not increased. In Haryana normal maize is grown in 6000 ha for grain purpose, 2000-3000 ha area covered by the baby corn and sweet corn and approximately 15000 ha is utilized for fodder purpose during *kharif* season.

The corn which has some specific properties that make it suitable for particular end uses are called specialty corn. Quality protein maize (QPM), baby corn, sweet corn, popcorn, high oil corn, high starch corn, waxy corn are different types of specialty corns and among this sweet corn is most important because it fetches more returns in the market. In initial days sweet corn was imported from other countries to meet the growing demand of the country. But now the farmers have started its cultivation in India and recently it is becoming more popular in national capital region of Haryana state. The sweet corn can be cultivated in Haryana successfully in all the three seasons *i.e., Rabi, Kharif* and *Spring*. The sweet corn is used in different ways like cob is boiled, steamed, or grilled whole; the kernels are then eaten directly off the cob or cut off. Creamed corn is sweet corn served in a milk or cream sauce. It is also used as a pizza topping, mix vegetables, sweet corn soup or in salads. Farmers cultivating sweet corn earn more money even double the income they initially earning by cultivating normal maize. in addition to the end product sweet corn farmers also getting 200-250 quintals of green fodder for cattle. The sweet corn crop become ready for harvesting 16 days prior to the normal maize and in the meantime left after harvesting of sweet corn to the sowing of new crop farmer can take one additional short duration vegetable crop. Hence, cultivation of sweet corn may be helpful for economic growth, employment generation, flourish cattle industry, social upliftment and simultaneously in crop diversification in the Haryana state.

Keeping this point in mind, a study was conducted on evaluation of ten sweet corn entries against two checks.

MATERIALS AND METHODS

A trial was conducted during *Kharif* 2022 to evaluate the performance of ten sweet corn entries against two checks (CMVL sweet corn 1 and Misthi) received from ICAR-IIMR Ludhiana using Randomized Block Design (RBD). Each entry was sown in a plot size of 8.4 m^2 (four rows of 3.5 m with row to row spacing 0.6 m), keeping plant to plant spacing 20 cm with three replications. Data was recorded on traits namely, days to 50% anthesis, days to 50% silking, ear number/ha, ear height (cm), plant height (cm), green cob yield with husk (kg/ha), green cob yield without husk (kg/ha), fodder yield (kg/ha) and total soluble solutes (%).

RESULTS AND DISCUSSION

Agronomic traits : The genotype CP Sweet 2 sweet was earliest in terms of days to 50 % anthesis and days to 50 % silking both with mean values 51.3 and 51.7 days respectively. According to Dickert *et al.,* 2002, this earliness is showing heterosis over the check. Whereas, maximum mean values for days to 50% anthesis was reported in genotype FSCH144 and check Misthi (52.7 days) and maximum mean values for days to 50% silking reported in FSCH 144 (54 days) followed by check Mishti (53.3 days), FSCH 131 and FSCH 196 (53 days each). Maximum number of ears per hectare were reported in genotype FSCH 196 (99074 ears/ha) whereas, minimum value of ear per hectare was accounted by ISCH 1901. In terms of plant height, maximum value for this trait was reported by entry FSCG 196 with 230 cm of height and minimum height were reported by CSCH 16034 (186 cm). Above results were supported by Arya *et al*., 2016 & 2020.

Total Soluble Solutes : Maximum TSS value was reported by FSCH 196 (18.1) and minimum value reported by CSH 16027 (16.4). The genotypes having more soluble solutes are more preferred by the animals and enhances the milk production of animal.

Green Cob yield : Maximum green cob yield with husk was reported in the genotype CSCH 16027 (14,442 kg) and minimum in genotype CPSC-301 (11526 kg). Maximum green cob yield without husk was reported in the check Misthi (11775 kg/ha) followed by the genotype CSCH 16027 (11526 kg/ha) while minimum green cob yield with and without husk was reported in the genotype CPSC-301 (11900 kg/ha and 9625 kg/ha, respectively).

Forage yield : Maximum forage yield was reported in genotype MSCH 2101 (29604 kg/ha) followed by FSCH 196 (29499.81 kg/ha) and ISCH 1901(29399.81 kg/ha) while minimum forage yield was reported in genotype FSCH 144 (24513.73 kg/

TABLE 1

Mean performance for green cob yield, fodder yield and agronomic traits in ten genotypes of sweet corn

Entry	Days to 50% anthesis	Days to 50% silking	No. of ears/ ha	Ear height	Plant height	Green cob yield with husk (kg)	Green cob yield without husk (kg/ha)	Superiority in green cob yield with husk over the best check (%)	Superiority in green cob yield with out husk over the best check (%)	Fodder yield (kg/ha)	Superiority in fodder yield over the best check (%)	Total soluble solutes
CP Sweet 2	51.3	51.7	97685	83.3	212	12824	10322	-11.043	-12.340	25749.84	-1.90475	17.3
CPSC-301	52.0	52.3	95370	73.3	190	11900	9625	-17.453	-18.259	27937.32	6.42858	17.2
CSCH 16027	52.0	52.7	97685	82.3	225	14442	11526	0.007	0.008	28758.15	9.555564	16.4
CSCH 16034	52.0	52.7	96759	77.3	186	12193	9801	-15.420	-16.764	27624.82	5.238103	17.6
CSCH 17021	51.7	52.0	97685	78.3	195	13064	10440	-9.378	-11.338	27569.27	5.026463	17.2
FSCH 131	52.3	53.0	96296	82.0	210	13529	10925	-6.153	-7.219	28944.26	10.26456	17.4
FSCH 144	52.7	54.0	95370	92.7	227	13991	11407	0.007	0.008	24513.73	-6.61375	17.8
FSCH 196	51.7	53.0	99074	86.7	230	13851	11288	-3.919	-4.136	29499.81	12.38096	18.1
ISCH 1901	51.7	52.0	94907	83.3	206	12382	9969	-14.109	-15.338	29399.81	12.00001	16.7
MSCH 2101	52.0	52.3	95370	74.0	203	12412	10154	-13.901	-13.766	29603.98	12.77779	17.3
CMVL sweet corn 1 ©	52.0	52.7	97222	78.7	207	12744	10456	0.006	0.008	29235.92	11.37567	17.2
Misthi ©	52.7	53.3	98611	85.0	224	14416	11775	0.000	0.000	26249.83	0	17.6
Location mean	52.0	52.6	96836	81.4	209	13146	10641					
27923.9		17.3										
CV (%)	1.3	1.8	2.5	8.4	10.1	10.68	10.13			3.4		5.1
CD (5%)	1.2	1.6	4129.9	11.5	35.7	2376.31	1825.11			1380.24		1.5
CD (1%)	1.6	2.2	5603.7	15.7	48.6	3229.82	2480.65			2093.45		2.1

ha). Above results were supported by Arya *et al*., 2015 & 2021.

Heterosis : The extent of economic heterosis for green cob yield with husk over best check ranges from -17.453 to 0.007% and for green cob yield without husk over the best check ranges from -18.209 to 0.008%. The positive heterosis was reported in genotypes CSCH 16027 and FSCH 144 in terms of green cob yield with husk over the best check (%) as well as in green cob yield without husk over the best check (%) although the values were negligible. Similar results were obtained by Chohan *et al.* (2020), Sudesh *et al.* (2018) and Yuwono *et al.* (2017).

The economic heterosis for fodder yield over best check ranges from -6.61 to 12.38 %. Maximum heterosis for fodder yield was reported in genotype MSCH 2101 with 12.77 % heterosis over the best check Misthi. The genotypes which showed greater than 10 per cent of heterosis over the best check are FSCH 131 (10.26 %), FSCH 196 (12.38 %), ISCH 1901 (12.01 %) and MSCH 2101 (12.77 %). Heterosis for forage yield in sweet corn was reported by Guerrero *et al.,* 2014.

CONCLUSIONS

The genotype FSCH 196 reported highest ear number per hectare but still it was inferior to the best check in terms of green cob yield with and without husk. This indicates the number of cobs per hectare not always indication of high yield. The two genotypes namely CSCH 16027 and FSCH 144 were found at par with the best check Misthi for green cob yield without husk. Among these two genotypes only one genotype namely CSCH 16027 showed superiority in fodder yield against the best check. So, it is concluded that this hybrid may be released after multilocation trials in breeding and agronomic trials.

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