

NOTE

Genotypic and Phenotypic Correlation for Thirteen Characters of Baby Corn (*Zea mays* L.)

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Abstract

Baby corn is the ear of the maize (*Zea mays* L.) plant harvested young especially when the silks have either not emerged or just emerged (1—3 cm), and no fertilization has taken place. The dehusked young ear is eaten as a vegetable. Character associations are of great significance to the breeders where they are to exercise selection for simultaneous improvement for more than one character. Therefore, correlation coefficient between yield and other traits, which confers the efficiency of selection, was estimated from materials developed from single crosses between five sweet corn lines and six prolific maize lines. Since sweetness and prolificacy are the two main characters of preference for baby corn, sweet corn lines and prolific maize lines were taken for the study. In the study, 13 characters i.e. husked yield, dehusked yield, standard yield, ear length, ear diameter, breaking pressure, elasticity, TSS, fodder yield, plant height, ear height, days to harvest and number of ears per plant were observed. It is observed that marketable ear yield (dehusked yield) was basically associated with its components viz. husked yield, standard yield, ear length, ear diameter and ear number per plant, essentially associated with quality trait like TSS (genotypic) and associated with lower ear placement (ear height) and early maturity (days to harvest).

Key words : Baby corn, Sweet corn, Prolific maize, Genotypic correlation, Phenotypic correlation.

Baby corn is the ear of the maize (*Zea mays* L.) plant harvested young especially when the silks have either not emerged or just emerged (1—3 cm), and no fertilization has taken place. For designing an effective plant breeding program, adequate knowledge about the magnitude and direction of association between yield and its component characters is essential. The direct selection for yield and other economic characters is rendered ineffective due to its complex nature of inheritance which is also influenced by fluctuating environmental components. Since, the yield and the quality of preference for baby corn is entirely different from regular maize, selection of baby corn will depend on other different secondary characters. Character associations are of great significance to the breeders where they are to exercise selection for simultaneous improvement for more than one character. Therefore, correlation coefficient between yield and other traits, which confers the efficiency of selection, was estimated. Since, sweetness and prolificacy are the two main characters of prefer-

ence for baby corn, sweet corn lines and prolific maize lines were taken for the study.

Five sweet corn lines viz. Hawaiian Sugar (Aul), Hawaiian Sugar (Au2), Sweet corn synthetic, Hawaiian-38 and Sweet corn pool-1, and six prolific corn lines viz. S-18, S-18E, T-2, T-2E, N-3 and SNT, were grown during 2002-2003 *rabi* at District Seed Farm, Kalyani, with the spacing 75 × 25 cm, following standard cultivation practices. The five sweet corn lines were crossed with six prolific lines in a single cross mating design to obtain 30 F₁s without reciprocals. For the study of the performance of materials developed, by single cross (sweet corn × prolific maize), the experiment was laid out separately in a randomised block design with three replications. Thirty sweet corn × prolific maize hybrids along with the 11 parents and a standard check VL-42, were put in trial separately in two environments (*kharif*, 2003 and *rabi*, 2003-04). Following characters were studied in the present investigation viz. husked yield (kg/ha), dehusked yield (kg/ha), standard yield (kg/

Table 1. Phenotypic and genotypic correlation coefficient among characters studied for baby corn production over pooled environment from 30 single crosses of sweet corn × prolific corn including parents and a standard check. **Significant at 1% level of probability, *Significant at 5% level of probability. rp = Phenotypic correlation, rg = Genotypic correlation.

Characters		Husked yield	Dehusked yield	Standard yield	Ear length	Ear diameter	Breaking pressure	Elast
Husked yield	rp	1.00	0.725**	0.676**	0.273	0.336*	0.164	-0.095
Yield	rg	1.00	0.766**	0.883**	0.539**	0.514**	0.348**	-0.004
Dehusked yield	rp		1.00	0.573**	0.515**	0.513**	0.342*	0.030
Standard yield	rg		1.00	0.625**	0.892**	0.896**	0.779**	0.171
Ear length	rp			1.00	0.232	0.286	0.129	-0.099
Ear diameter	rg			1.00	0.554**	0.598**	0.423**	-0.140
Breaking pressure	rp				1.00	0.533**	0.291	-0.011
Elast.	rg				1.00	0.790**	0.594**	-0.015
TSS	rp					1.00	0.481**	-0.029
Fodder yield	rg					1.00	0.547**	-0.158
Plant height	rp						1.00	0.023
Ear height	rg						1.00	-0.227
Days to harvest	rp							1.00
No. of ears per plt.	rg							1.00

Table 1. Continued.

Characters		Husked yield	TSS	Fodder yield	Plant height	Ear height	Days to harvest	No. of ears/plant
Husked yield	rp	1.00	0.014	0.026	0.158	-0.199	-0.384*	0.363*
Dehusked yield	rg	1.00	0.299	0.159	0.168	-0.333*	-0.708**	0.532**
Standard yield	rp		0.161	-0.080	0.057	-0.285	-0.437**	0.321*
Ear length	rg		0.448**	-0.117	-0.169	-0.793**	-0.883**	0.620**
Ear diameter	rp		0.077	-0.073	0.097	-0.199	-0.339*	0.277
Breaking pressure	rg		0.245	0.044	0.020	-0.634**	-0.827**	0.461**
Elast.	rp		-0.069	-0.089	-0.079	-0.248	-0.279	0.238
TSS	rg		-0.219	-0.240	0.127	-0.467**	-0.525**	0.428**
Fodder yield	rp		-0.094	-0.088	0.007	-0.408**	-0.538**	0.111
Plant height	rg		-0.303*	-0.253	-0.210	-0.628**	-0.666**	0.185
Ear height	rp		-0.105	-0.024	0.118	-0.184	-0.359*	0.005
Days to harvest	rg		0.231	0.118	-0.100	-0.622**	-0.672**	0.000
No. of ears per plt.	rp		-0.224	0.043	0.018	0.077	-0.042	0.098
	rg		-0.251	0.037	0.017	-0.010	-0.152	0.161
	rp		1.00	0.085	-0.013	0.110	0.291	-0.063
	rg		1.00	0.182	0.163	0.697**	0.609**	-0.136
	rp			1.00	0.263	0.291	0.113	0.039
	rg			1.00	0.952**	0.548**	0.294	0.052
	rp				1.00	0.573**	0.043	-0.046
	rg				1.00	0.523**	0.095	-0.076

Table 1. Continued.

Characters	Husked yield	TSS	Fodder yield	Plant height	Ear height	Days to harvest	No. of ears/plant
Ear height	rp				1.00	0.492**	-0.150
	rg				1.00	0.857**	-0.222
Days to harvest	rp					1.00	-0.213
	rg					1.00	0.255
No. of ears per plt.	rp						1.00
	rg						1.00

ha), ear length (cm), ear diameter (cm), ear breaking pressure (gm/unit area), elasticity capacity of ear ($^{\circ}$), TSS (%), fodder yield (q/ha), plant height (cm), ear height (cm), days to first harvesting (baby corn) and number of ears per plant.

From the pooled performance data of the 30 F_1 single cross hybrids, 11 parents and a standard check (VL-42) in *kharif* 2003 and *rabi* 2003-04, the phenotypic and genotypic correlations were estimated. The phenotypic and genotypic correlations between various characters are presented in Table 1.

The data revealed that the main character dehusked ear yield of baby corn was positively and significantly correlated (phenotypically and genotypically) with husked yield, standard yield, ear length, ear diameter, breaking pressure (not desirable), and number of ears per plant whereas TSS showed genotypically significant correlation. Negative (desirable) significant correlation was observed with days to harvest and ear height.

Thus it indicates that marketable ear yield (dehusked yield) was basically associated with its all components viz. husked yield, standard yield, ear length, ear diameter and ear number per plant, essentially associated with quality trait like TSS (genotypic) and interestingly associated with lower ear placement (ear height) and early maturity (days to harvest).

However, yield was unfortunately not associated with tenderness (breaking pressure).

Similar results of positive correlation (both genotypic and phenotypic) between dehusked yield of baby corn and its component characters were observed by Tiwari and Verma (1999), Viola et al. (2003) and Koner and Prodhan (2005). Tiwari and Verma (1999) also reported negative correlation of ear length with dehusked yield, which is contrary to the result obtained in the study.

Based on this study, it is suggested that for increasing the yield of baby corn (dehusked yield) due considerations during selection should be given for related characters, i. e. husked yield, standard yield, ear length, ear diameter, number of ears per plant, TSS, ear height and days to harvest.

References

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