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CORRELATION, PATH COEFFICIENT AND REGRESSION ANALYSIS TO DETERMININE THE RELATIVE CONTRIBUTIONS OF SOME AGRONOMIC TRILS WITH GRAIN YIELD IN TEN MAIZE (*Zea Mays, L*) GENOTYPES

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ABSTRACT

This investigation was carried out at Mazora(West Elfashen) Agriculture Res.st. ,Beni-Swef Governorate during 2002 and 2003 growing seasons the aime of this investigation estimate the relative contributions of some agronomic traits ten maize single crosses; SC10, 120, 122, 123, 124, 129, Watania 4, Bashaier, SC155 and SC161. These hybrids were evaluated under five planting dates i.e. March 10th , March 30th , April 20th ,May 10th and May 30th in two seasons. Randomized complete blocks design with four replications was used. The studied traits in both seasons were grain yield (ard/fad), days to 50% tasseling, days to 50% silking, plant height, ear height, number of plants per plot at harvest, ear length and ear diameter.

Correlation, path coefficient and stepwise multiple regression analysis were calculated for yield and its attributes in each planting date in the two seasons Results for grain yield showed significant positive correlation coefficient with plant height, ear height, ears number at harvest and ear length . Furthermore stepwise multiple regression and path coefficient with respect path analysis results in indicated that ears number and ear length were contributed by 21.77% and 9.38% respectively in the first season and by 14.11% and 7.84% respectively in the second season as an overages plating date in direct effects. analysis showed that ears number at harvest and ear length had the highest direct and indirect influences on yield. which contributed by 19.16% and 7.34% respectively in the first season and by 34.62% and 9.10% respectively In the second season as an average of planting dates.

It could concluded that ear number and ear length are the important characters contribution to grain yield

INTRODUCTION

The relationships among maize Grain yield and yield components are complex. Yield attributes are influenced by genetical and environmental variations as well as, genotype X environment interaction. In their selection criteria for yield, breeders place more emphasis on some attributes than other, with the degree of importance varying among breeders. Meanwhile, to determine the relative importance of such attributes to the potential Grain yield, different statistical techniques such as correlation, path coefficient and regression analysis are successfully applied.

However, the problem arises when the purposes are to construct prediction equations. In some cases, several yield components have a high correlation coefficients with yield, but it may contribute a little to the accuracy of the prediction equation. With this point of view, the stepwise multiple regression analysis might be the appropriate technique due to its sequence in analyzing data of such breeding materials. Stepwise program computes a sequence of multiple linear regression in a stepwise manner. One variable is added to the regression equation at each step. The variable added is the one, which makes the greatest reduction in the error sum of esquires. It is also the variable which has the highest partial correlation with the dependent variable for fixed values of those variables already added and the variable which would have the highest F value (Snedecor and Cochran, 1982; Draper and Smith, 1996). Therefore, this study was taken up, utilizing stepwise multiple regression and path-coefficient analysis on a number of maize hybrids grown at every planting dates in two successive growing seasons. The aims of this study were to determine the order of importance of the yield attributes as well as to detect the influence of the environmental variation (5 planting dates) on the relationships between yield and its attributes. In addition a prediction model for maize Grain yield that includes accepted variables can be set up.

MATERIALS AND METHODS

Five field experiments were conducted at Mazora(West Elfashen), Beni-Swef Governorate in 2002 and 2003 growing seasons to determine the relative contributions of some agronomic traits to yield of ten maize single crosses hybrids, SC10, 120, 122, 123, 124, 129, 155, 161, Watania 4, and Bashaier. These hybrids were evaluated under five planting dates, i.e. March 10^{th} , March 30^{th} , April 20^{th} ,May 10^{th} and May 30^{th} for the two seasons(2002&2003).

Randomized complete blocks design with four replications was used. Plot size was of four rows, 6 m long and 80 cm apart. Planting was done in hills spaced 25 cm along the row. Two kernels were planted per hill to provide a population of approximately 22.000 plants/faddan(faddan 4200 m^2). All cultural practices were applied as recommended. Data were recorded on the two inner rows for number of days to 50% tasseling (X_1), number of days to 50% silking (X_2), Plant height in cm (X_3), ear height (X_4), ears number at harvest (X_5), ear length in cm (X_6), ear diameter in cm (X_7), and Y grain Yield ardab/Faddan.

Path-coefficient analysis was performed to partition the correlation coefficient, r_{ij} unto direct and indirect effects. The following simultaneous equations were solved to determine the path coefficient, P_{ij} (with subscripts indicating yield and characters):

$$-r_{iy} = P_{iy} + r_{ij} P_{jy} + \dots + r_{kk} P_{ky.} \text{ ,which } i\&j=1,2,\dots,k .$$

the residual effect is obtained by the relation

$$P_{ry} = SQR.\{1-(P_{1y}r_{1y} + \dots + P_{ky}r_{ky})\}$$

The above mentioned traits were computed according to Dewey and Lu (1959), Duarte and Adams (1972), Singh and chaudhary (1979) Snedecor and Cochran (1982), Brame *et al* (1991), Chawdhry *et al* (1991) and Mitkees *et al* (1992).

RESULTS AND DISCUSSION

The studied traits mean values of the evaluated maize hybrids and their standard deviation for each planting date in both seasons are recorded in Table (1). It is worthy to mention that genotypes of diversity in their growth nature and grain yield potentiality were used as plant materials to represent most of maize types (determinate, indeterminate, minor and major types).

Table 1 :Mean values(X) and standard deviation(S.D) maize characters measured in 2002 and 2003 .

Characters		D1		D2		D3		D4		D5	
		X	S.D.	X	S.D.	X	S.D.	X	S.D.	X	S.D
2002											
Days To 50% tasseling.	X_1	76.90	02.15	66.60	01.74	63.90	02.37	61.40	02.72	61.00	01.75
Days To 50% silking.	X_2	78.60	03.08	69.10	02.01	66.10	02.75	62.70	02.88	63.90	02.05
Plant height in cm.	X_3	201.0	15.60	200.0	15.20	201.0	15.20	214.0	20.20	212.0	15.70
Ear height in cm.	X_4	100.0	12.70	101.0	16.20	104.0	11.90	114.0	16.50	114.0	10.90
Ears number at harvest.	X_5	30.30	03.10	31.10	05.05	31.30	04.00	33.60	03.84	32.00	03.79
Ear length in cm.	X_6	19.20	01.93	20.80	01.44	20.60	01.76	20.60	02.07	22.40	02.10
Ear diameter in cm.	X_7	05.04	00.51	05.24	0.28	04.77	00.23	04.74	00.19	04.84	00.18
Yield Ard./Fed.	Y	27.20	07.67	34.50	05.39	34.40	06.56	33.60	05.86	32.10	06.11
2003											
Days To 50% tasseling.	X_1	78.60	01.97	68.60	03.05	64.20	01.55	60.30	02.92	62.90	03.37
Days To 50% silking.	X_2	81.70	02.33	71.20	02.98	66.90	02.39	64.30	02.96	64.50	02.89
Plant height in cm.	X_3	207.0	15.80	203.0	13.60	215.0	19.40	216.0	15.30	201.0	21.40
Ear height in cm.	X_4	105.0	10.20	102.0	09.58	116.0	13.30	111.0	10.70	105.0	16.30
Ears number at harvest.	X_5	31.10	03.73	29.60	03.32	30.40	03.69	29.40	04.07	30.30	05.80
Ear length in cm.	X_6	20.80	01.39	20.40	01.90	20.90	01.83	19.30	01.86	19.60	02.08
Ear diameter in cm.	X_7	05.04	00.21	04.84	00.25	04.86	00.19	04.50	00.22	04.50	00.21
Yield Ard./Fed.	Y	33.60	04.77	26.70	07.66	30.30	05.83	24.80	06.36	23.30	07.20

Because of the great differences between genotypes under investigation, great deal of variation was observed as high values of standard deviation for all characters relative to their mean values as shown in Table 1. Simple correlation coefficient between grain yield (Y) and some agronamic characters (X_1-X_7) of maize for both every planting dates in two growing seasons are given in Table (2). Highly significant correlations were found between grain yield and most of the studied characters. Furthermore, in order to assess the relative contributions of these characters to yield, stepwise regression and path coefficient analysis were utilized.

Table 2 : Simple correlation coefficients between Grain yield and some agronomic characters

Characters		D1	D2	D3	D4	D5
		2002				
Days To 50% tasseling.	X_1	-0.759^{**}	0.141	0.027	-0.175	0.340^{*}
Days To 50% silking.	X_2	-0.751^{**}	0.150	-0.075	-0.140	0.354^{*}
Plant height in cm.	X_3	0.427^{**}	0.334^{*}	0.447^{**}	0.452^{**}	0.588^{**}
Ear height in cm.	X_4	0.368^{**}	0.207	0.479^{**}	0.475^{**}	0.503^{**}
Ears number at harvest.	X_5	0.565^{**}	0.655^{**}	0.532^{**}	0.657^{**}	0.630^{**}
Ear length in cm.	X_6	0.685^{**}	0.368^{**}	0.592^{**}	0.448^{**}	0.332^{*}
Ear diameter in cm.	X_7	0.530^{**}	0.183	-0.121	0.350^{*}	0.303^{*}
		2003				
Days To 50% tasseling.	X_1	-0.237^{*}	-0.322^{*}	0.054	-0.286^{*}	-0.001
Days To 50% silking.	X_2	-0.220	-0.291^{*}	-0.069	-0.262^{*}	0.079
Plant height in cm.	X_3	0.364^{**}	0.333^{*}	0.665^{**}	0.064	0.419^{**}
Ear height in cm.	X_4	0.360^{*}	0.409^{**}	0.629^{**}	0.009	0.420^{**}
Ears number at harvest.	X_5	0.636^{**}	0.483^{**}	0.390^{**}	0.595^{**}	0.092
Ear length in cm.	X_6	0.327^{*}	0.430^{**}	0.460^{**}	0.320^{*}	0.545^{**}
Ear diameter in cm.	X_7	-0.022	0.175	0.350^{*}	0.093	-0.131

***& ** Significance at 5% and 1% levels of probability, respectively.**

The relative contribution (R^2 %) and the prediction equations for the full model and stepwise regression are shown in Tables (3 and 4). The accepted variable had the highest coefficient of multiple determination with the grain yield adjusted for variables already added.

Table 3 :The prediction equations for the case of all variables .

The	The prediction equation	S. E	R^2 %
	2002		
D_1	$\hat{Y}_{11} = 63.8-1.01X_1-0.46X_2+0.18X_3-0.16X_4+0.6X_5+1.97X_6+0.075X_7$	2.792	89.1%
D_2	$\hat{Y}_{12} = -69.2+0.17X1+0.16X_2+0.06X3+0.01X_4+0.8X_5+0.7X_6+5.55X_7$	3.401	67.3%
D_3	$\hat{Y}_{13} = 0.725-0.004X_1-0.56X_2+0.12X_3-0.10X_4+0.8X_5+2.5X_6-4.07X_7$	3.757	73.1%
D_4	$\hat{Y}_{14} = -73.1-0.58X_1+0.71X_2+0.01X_3+0.07X_4+0.93X_5+0.66X_6+8.78X_7$	3.416	72.1%
D_5	$\hat{Y}_{15} = -109.8+0.20X_1+0.35X_2+0.02X_3+0.18X_4+0.91X_5-0.004X_6+11X_7$	3.66	70.5%
	2003		
D_1	$\hat{Y}_{21} = -70.1+0.47X_1-0.13X_2+0.03X_3+0.12X_4+0.95X_5+0.96X_6+1.63X_7$	3.065	66.1%
D_2	$\hat{Y}_{22} = -0.33-0.28X_1-0.29X_2-0.13X3+0.50X_4+1.20X_5+1.33X_6-4.01X_7$	5.270	61.2%
D_3	$\hat{Y}_{23} = -152.5+2.65X_1-1.18X_2+0.07X_3+0.08X_4+0.64X_5+0.8X_6+6.19X_7$	3.585	69.0%
D_4	$\hat{Y}_{24} = -30.57-0.59X_1+0.29X_2-0.14X_3+0.26X_4+0.96X_5+0.97X_6+6.08X_7$	4.969	49.9%
D_5	$\hat{Y}_{25} = 5.74-0.02X_1-0.18X_2+0.03X_3+0.05X_4+0.09X_5+1.61X_6-3.04X_7$	6.418	34.4%

Table 4 :The prediction equations for the case of all variables .

The	The prediction equation	S. E	R^2 %
	2002		
D_1	$\hat{Y}_{11}$ =85.15-1.65X_1+0.07X_3+0.59X_5+1.94X_6	2.834	87.8%
D_2	$\hat{Y}_{12}$ =-47.57+0.09X_3+0.75X_5+0.71X_6+5.07X_7	3.389	63.5%
D_3	$\hat{Y}_{13}$ =-10.1-0.52X_2+0.85X_5+2.53X_6	3.781	69.4%
D_4	$\hat{Y}_{14}$ =-61.3+0.08X_4+0.89X_5+0.76X_6+8.38X_7	3.324	71.1%
D_5	$\hat{Y}_{15}$ =-83.52+0.22X_4+0.93X_5+12.4X_7	3.607	67.9%
	2003		
D_1	$\hat{Y}_{21}$ =-34.08+0.1X_3+0.85X_5+0.99X_6	2.982	63.9%
D_2	$\hat{Y}_{22}$ =-69.85+0.31X_4+1.22X_5+1.39X_6	5.267	56.4%
D_3	$\hat{Y}_{23}$ =-38.23+0.148X_3+0.46X_5+1.07X_6	3.848	59.8%
D_4	$\hat{Y}_{24}$ =-20.07+0.90X_5+0.95X_6	4.922	43.2%
D_5	$\hat{Y}_{25}$ =-13.518+ 1.88X_6	6.098	29.7%

The results indicate that environmental conditions might change the magnitude of the relationships between grain yield and the other plant characters. The accepted and removed variables and the relative contribution R^2% in yield variance among the different planting dates are illustrated in Table 5, (X_6, X_3, X_5 and X_1) for D_1 (87.8% accepted), (X_6, X_3, X_5 and X_7) for D_2 (63.5% accepted), (X_6, X_5 and X_2) for D_3 (69.4% accepted), (X_6, X_4, X_5 and X_7) for D_4 (71.1% accepted) and (X_4, X_5 and X_7) for D_5(67.9% accepted) (87.8% accepted)in the first season, (X_6, X_5 and X_3) for D_1 (63.9% accepted), (X_6, X_5 and X_4) for D_2 (56.4% accepted), (X_6, X_5 and X_3) for D_3 (59.8% accepted), (X_6, and X_5) for D_4 (43.2% accepted) and (X_6) for D_5 (29.7% accepted) in the second season , were accepted to their contributions of reduction the yield variance.

Table 5 : Accepted and removed variables according to stepwise and their relative contributions (R^2 %) in Grain yield over the tow seasons.

Variables	D1		D2		D3		D4		D5	
	Var.	R^2%	Var.	R^2%	Var.	R^2%	Var.	R^2%	Var.	R^2%
					2002					
Accepted	X_1	57.6%	X_5	42.9%	X_6	35.0%	X_5	43.2%	X_5	39.7%
	X_6	24.1%	X_6	13.6%	X_5	30.2%	X_7	13.3%	X_4	14.6%
	X_5	04.4%	X_7	04.6%	X_2	04.1%	X_6	10%	X_7	13.6%
	X_3	01.6%	X_3	05%			X_4	04.5%		
TOTAL		87.8%		63.5%		69.4%		71.1%		67.9%
Removed	X_1		X_1		X_1		X_1		X_1	
	X_2		X_2		X_2		X_2		X_2	
	X_4		X_4		X_4		X_3		X_3	
	X_7				X_7				X_6	
Residual		02.7%		03.8%		03.7%		01.0%		02.6%
All variables		89.1%		67.3%		73.1%		72.1%		70.5%
					2003					
Accepted	X_5	40.5%	X_5	23.3%	X_3	44.2%	X_5	35.4%	X_6	29.7%
	X_3	15.5%	X_4	21.7%	X_6	07.7%	X_6	07.8%		
	X_6	08.0%	X_6	11.4%	X_5	07.9%				
TOTAL		63.9%		56.4%		59.8%		43.2%		29.7%
Removed	X_1		X_1		X_1		X_1		X_1	
	X_2		X_2		X_2		X_2		X_2	
	X_4		X_3		X_4		X_3		X_3	
	X_7		X_7		X_7		X_4		X_4	
							X_7		X_5	
									X_7	
Residual		02.2%		04.8%		09.2%		06.7%		04.7%
All variables		66.1%		61.2%		69.0%		49.9%		34.4%

However, the relative importance of this accepted variable that contributed to grain yield could be placed. the (X_6) ear length in cm. had (R^2%) of (24.1, 13.6, 35 and 10) for D_1, D_2, D_3 and D_4 respectively, for the first season and (8, 11.4, 7.7, 7.8 and 29.7) for D_1, D_2, D_3, D_4 and D_5 respectively in the second season. Meanwhile, the stepwise multiple regression analysis was undertaken to determine the best variables that mostly reduce the variance of yield. This is done by introducing the variables, into the regression analysis in order to their importance.

These results are in agreement with the path coefficient analysis data given in Tables (6&7). The data show that (X_5) ears number at harvest and (X_6) ear length in cm., had the highest direct effect (X_5) (42.44, 19.67, 29.36%) respectively for D_2, D_4 and D_5, (X_6) (14.82, 26.23 %) respectively for D_1 and D_3 in the first season. (X_5) (30.45, 14.01, 19.40%) respectively for D_1, D_2 and D_4, (X_6) (6.94, 20.8 %) respectively for D_1 and D_5 in the second season..

Table 6 : Components (direct and indirect effect) in percentages of Grain yield in 2002.

Source of variation	D_1		D_2		D_3		D_4		D_5	
	C.D	%	C.D	%	C.D	%	C.D	%	C.D	%
Direct. X_1	0.080	4.913	0.004	0.358	0.000	0.001	0.069	3.691	0.004	0.341
X_2	0.034	2.069	0.003	0.214	0.054	3.133	0.118	6.260	0.013	1.249
X_3	0.129	7.934	0.029	2.374	0.075	4.354	0.002	0.110	0.002	0.235
X_4	0.065	3.966	0.001	0.117	0.031	1.804	0.041	2.210	0.099	9.189
X_5	0.058	3.573	0.514	42.44	0.239	13.84	0.370	19.67	0.318	29.36
X_6	0.242	14.82	0.036	2.944	0.454	26.23	0.055	2.925	0.000	0.000
X_7	0.000	0.005	0.083	6.871	0.021	1.192	0.083	4.439	0.108	10.01
TOTAL	0.608	37.28	0.670	55.32	0.874	50.55	0.738	39.30	0.544	50.38
Indirect.X_1*X_2	0.094	5.739	0.006	0.532	0.002	0.095	0.176	9.355	0.012	1.075
*X_3	0.051	3.171	0.009	0.787	0.000	0.003	0.005	0.282	0.002	0.206
*X_4	0.028	1.730	0.001	0.120	0.000	0.004	0.025	1.313	0.015	1.387
*X_5	0.072	4.391	0.004	0.304	0.000	0.002	0.098	5.215	0.003	0.240
*X_6	0.078	4.813	0.003	0.264	0.001	0.091	0.043	2.307	0.000	0.001
*X_7	0.002	0.147	0.007	0.584	0.000	0.013	0.045	2.372	0.002	0.225
Indirect.X_2*X_3	0.041	2.504	0.006	0.536	0.017	0.989	0.006	0.335	0.002	0.222
*X_4	0.023	1.415	0.001	0.073	0.016	0.918	0.031	1.629	0.013	1.179
*X_5	0.043	2.659	0.001	0.084	0.033	1.936	0.123	6.525	0.009	0.848
*X_6	0.052	3.212	0.002	0.195	0.101	5.838	0.057	3.030	0.000	0.001
*X_7	0.001	0.109	0.005	0.420	0.001	0.514	0.053	2.815	0.019	1.783
Indirect.X_3*X_4	0.173	10.61	0.009	0.752	0.085	4.922	0.017	0.929	0.027	2.473
*X_5	0.029	1.821	0.005	0.381	0.084	4.828	0.009	0.479	0.021	1.958
*X_6	0.096	5.921	0.024	1.972	0.077	4.467	0.004	0.244	0.000	0.004
*X_7	0.002	0.146	0.002	0.170	0.002	0.105	0.007	0.367	0.002	0.150
Indirect.X_4*X_5	0.019	1.152	0.001	0.107	0.063	3.628	0.045	2.386	0.073	6.767
*X_6	0.072	4.386	0.002	0.198	0.063	3.632	0.026	1.393	0.000	0.017
*X_7	0.002	0.102	0.000	0.016	0.005	0.281	0.028	1.485	0.009	0.863
Indirect.X_5*X_6	0.029	1.805	0.001	0.045	0.020	1.181	0.038	2.048	0.001	0.047
*X_7	0.000	0.010	0.087	7.206	0.007	0.439	0.008	0.448	0.031	2.881
Indirect.X_6*X_7	0.004	0.250	0.036	2.995	0.002	0.112	0.017	0.915	0.000	0.014

C.D. coefficient of determination ,% percentage contributed.

The above results are in agreement with Katta (1976), Omar *et al* (1970), Nuttal *et al* (1992), Selim *et al* (1970), Ramsey and Callinan (1994), Mason and Brennan (1998).

Table 7 : Components (direct and indirect effect) in percentages of Grain yield in 2003.

Source of variation	D_1		D_2		D_3		D_4		D_5	
	C.D	%	C.D	%	C.D	%	C.D	%	C.D	%
Direct. X_1	0.021	1.518	0.009	0.483	0.644	16.12	0.063	2.872	0.000	0.005
X_2	0.017	1.227	0.012	0.652	0.439	10.99	0.025	1.127	0.006	0.565
X_3	0.069	4.911	0.051	2.681	0.001	0.023	0.061	2.818	0.008	0.746
X_4	0.007	0.536	0.380	19.99	0.132	3.311	0.126	5.760	0.009	0.889
X_5	0.429	30.45	0.266	14.01	0.251	6.299	0.424	19.40	0.004	0.431
X_6	0.098	6.945	0.112	5.882	0.105	2.644	0.065	2.977	0.220	20.80
X_7	0.001	0.072	0.018	0.958	0.016	0.392	0.039	1.797	0.008	0.732
TOTAL	0.642	45.66	0.848	44.66	1.588	39.78	0.803	36.75	0.255	24.17
Indirect.X_1*X_2	0.034	2.454	0.014	0.736	0.986	24.7	0.065	2.990	0.001	0.084
*X_3	0.004	0.278	0.002	0.141	0.007	0.176	0.030	1.371	0.000	0.023
*X_4	0.004	0.279	0.001	0.056	0.092	2.294	0.028	1.318	0.000	0.029
*X_5	0.067	4.773	0.024	1.286	0.294	7.358	0.111	5.077	0.000	0.009
*X_6	0.002	0.136	0.014	0.721	0.076	1.894	0.008	0.398	0.000	0.039
*X_7	0.000	0.034	0.010	0.529	0.029	0.739	0.024	1.117	0.000	0.011
Indirect.X_2*X_3	0.006	0.452	0.004	0.209	0.008	0.197	0.007	0.317	0.003	0.295
*X_4	0.003	0.211	0.014	0.751	0.064	1.616	0.003	0.137	0.004	0.414
*X_5	0.036	2.591	0.014	0.713	0.244	6.123	0.074	3.386	0.001	0.077
*X_6	0.011	0.764	0.009	0.505	0.012	0.291	0.001	0.070	0.017	1.652
*X_7	0.001	0.085	0.001	0.521	0.023	0.589	0.001	0.034	0.001	0.055
Indirect.X_3*X_4	0.041	2.909	0.247	13.00	0.020	0.503	0.168	7.680	0.016	1.512
*X_5	.029	2.079	0.013	0.662	0.007	0.189	0.041	1.893	0.003	0.304
*X_6	0.038	2.733	0.027	1.446	0.006	0.145	0.039	1.802	0.043	4.086
*X_7	0.000	0.027	0.014	0.721	0.004	0.093	0.036	1.665	0.000	0.003
Indirect.X_4*X_5	0.004	0.250	0.071	3.749	0.102	2.549	0.124	5.688	0.003	0.327
*X_6	0.011	0.783	0.092	4.836	0.067	1.669	0.051	2.352	0.046	4.296
*X_7	0.000	0.007	0.038	2.021	0.041	1.014	0.046	2.123	0.002	0.232
Indirect.X_5*X_6	0.052	3.723	0.002	0.127	0.024	0.604	0.023	1.079	0.003	0.359
*X_7	0.007	0.519	0.016	0.857	0.014	0.358	0.001	0.342	0.001	0.062
Indirect.X_6*X_7	0.003	0.203	0.021	1.092	0.010	0.263	0.004	0.203	0.006	0.592

C.D. coefficient of determination ,% percentage contributed.

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تحليل الارتباط و معامل المرور و الانحدار المتعدد التتابعي لتحديد الأهمية النسبية لمكونات المحصول في عشرة هجن فردية من الذرة الشامية

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** برنامج بحوث الذرة الشامية –معهد بحوث المحاصيل الحقلية –مركز البحوث الزراعية –الجيزة .

أجريت هذه الدراسة خلال موسمي٢٠٠٢ ، ٢٠٠٣ للمحصول و مكوناته لعشرة هجن فردية من الذرة الشامية (هـ ف ١٠، هـ ف ١٢٠، هـ ف ١٢٢، هـ ف ١٢٣، هـ ف ١٢٤، هـ ف ١٢٩، هـ ف وطنية ٤ ، هـ ف بشاير، هـ ف ١٥٥ و هـ ف ١٦١) وذلك من خلال خمس مواعيد زراعة وموسمين باستخدام تصميم قطاعات كاملة العشوائية في أربع مكررات. حيث تمت الزراعة في خمس مواعيد هي ١٠ مارس، ٣٠ مارس، ٢٠ أبريل، ١٠ مايو و ٣٠ مايو) خلال موسمي٢٠٠٢ و ٢٠٠٣ وذلك بمنطقة مزورة غرب الفشن محافظة بنى سويف، و كان الهدف من هذا العمل هو تقدير الأهمية النسبية لمكونات المحصول على محصول الذرة باستخدام معاملات الارتباط و المرور و الانحدار المتعدد المرحلي لكل ميعاد من مواعيد الزراعة الخمس خلال العامين (٢٠٠٣،٢٠٠٢) ، و قد أوضحت النتائج وجود ارتباط موجب معنوي بين المحصول و مكوناته و خاصة ارتفاع النبات و ارتفاع الكوز و عدد الكيزان عند الحصاد و طول الكوز و اتفقت نتائج الانحدار المرحلي المتعدد و معامل المرور علي ان عدد الكيزان عند الحصاد و ارتفاع الكوز أهم مكونات المحصول تأثيرا في المحصول.