

(2)

(1)

15

RCBD

( × ) ( × )  
( × )  
( × )

(%142.6)

4

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6091 . . (1)

(2)

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## Study of genetic behavior of some early maturing and high yielding mutant lines of soybean in different locations

Nizar Mir Ali<sup>(1)</sup> and Mohammad Moualla<sup>(2)</sup>

### ABSTRACT

This study aimed at checking the stability of some mutant lines from soybean varieties in different locations and to select the best performing lines in each location.

These lines 15 were selected according to previous experiments as being early maturing and/or that yield higher than the control. The study lasted three years, the experiment plants were grown in 3 locations: Raqa, Idleb and Lattakia. The experiment was designed as RCBD with 3 replicates for each variety.

Results showed significant difference between lines, Locations and year in both earliness and yield, A significant interaction was realized between (line X location) and (line X year) for earliness and yield. For earliness (line X year) was not significant. The reverse situation was realized for yield. Location. X year of yield and earliness was significant. Earliness was correlated positively with all characters (except for 100-seed-weight).

Yield was positively and significantly correlated with characters of all lines. Three lines with higher yield than the control (142.61%) and same maturity time were selected.

**Key words:** Soybean, Mutations, Lines, Precocity, Productivity.

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Interaction Genotypic Environmental (GXE)

% 45 23

Dashiell *et al.*, (1994)  
18

: 1

A3803

15 (C.y 200 150 100)

77, 205, 531, 619, 634, 69, 157, 638, 496, 346, 193, 90,

534, 321, 12b

M3

(IV-VI)

A3803

.M4

: 2

/ 1.5

RCBD

60

:

4/22 4/19

16 % 33

10

12 (%46) TSP

.%50

.  
:  
4/23 4/19  
90 .  
30  
%46  
%33 8  
15-13 :  
26-24 :  
28  
15  
100

. Stepwise regression analysis

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:  
4/29 4/26  
5-1 . / 30

ANOVA

2 way ANOVA

. 12 31 11

: 1

ANOVA  
 (P<0.001) .(1a,b )  
 (P<0.05)  
 (P<0.05) ( )  
 477 90 157 638

ANOVA (1a)  
 A3803

	DF	Sum of Squares	Mean Square	F-Value	P-Value		
	15	15.389	1.026	3.078	.0002	***	
	2	97.799	48.899	146.698	<.0001	***	
×	30	15.090	.503	1.509	.0527	*	
	1	98.000	98.000	294.000	<.0001	***	
×	15	6.333	.422	1.267	.2266	NS	
×	2	25.521	12.760	38.281	<.0001	***	
×	×	30	15.146	.505	1.515	.0511	*
	192	64.000	.333				

	1	18	3.000	.907	.214
477	2	18	2.889	.963	.227
205	3	18	2.722	1.274	.300
351	4	18	2.889	1.023	.241
619	5	18	3.056	.938	.221
638	6	18	2.222	1.003	.236
496	7	18	3.167	.985	.232
346	8	18	3.111	1.132	.267
193	9	18	3.000	1.138	.268
90	10	18	2.778	1.114	.263
534	11	18	2.944	1.211	.286
12b	12	18	2.944	1.162	.274
634	13	18	3.111	1.367	.322
157	14	18	2.667	1.138	.268
69	15	18	3.167	.985	.232
321	16	18	2.778	.943	.222

LSD (5%) 0.380

**A.3808**

**(1b)**

4	3.00	5	3.50	3	3.17	2	2.33	CON
3	3.05	3	3.83	3	3.17	3	2.17	477
6	2.89	5	3.50	4	2.83	2	2.33	205
10	2.22	7	2.67	6	2.50	5	1.50	351
8	2.72	2	4.00	7	2.17	4	2.00	619
1	3.17	4	3.67	2	3.33	1	2.50	638
6	2.89	5	3.50	5	2.67	1	22.50	496
2	3.11	2	4.00	3	3.17	3	2.17	346
4	3.00	5	3.50	2	3.33	3	2.17	193
2	3.11	1	4.17	5	2.67	1	2.50	90
7	2.78	5	3.50	6	2.50	2	2.33	534
9	2.67	6	3.33	6	2.50	3	2.17	12b
5	2.95	2	4.00	5	2.67	3	2.17	634
1	3.17	3	3.83	1	3.50	3	2.17	157
5	2.95	4	3.67	3	3.17	4	2.00	69
7	2.78	6	3.33	4	2.83	3	2.17	321
	2.90		3.62		2.88		2.19	
	0.71		0.95		1.46		0.65	LSD
	NS		NS		NS		NS	

NS

(2a,b )

634 496 69

.193

**ANOVA (2a)**

**A3803**

	DF	Sum of Squares	Mean Square	F-Value	P-Value	
	15	1093.006	72.867	3.628	<.0001	***
	2	485.803	242.901	12.094	<.0001	***
×	30	1275.203	42.507	2.116	.0013	***
	1	824.248	824.248	41.040	<.0001	***
×	15	755.807	50.387	2.509	.0021	***
×	2	721.215	360.607	17.955	<.0001	***
× ×	30	1791.285	59.709	2.973	<.0001	***
	192	3856.166	20.084			

...

**Means Table for yield f      Effect: no**

	1	18	11.712	2.940	.693
477	2	18	11.230	3.973	.936
205	3	18	10.839	3.457	.815
351	4	18	9.024	4.598	1.084
619	5	18	11.789	4.924	1.161
638	6	18	11.467	3.482	.821
496	7	18	15.355	7.585	1.788
346	8	18	11.979	5.739	1.353
193	9	18	14.633	6.670	1.572
90	10	18	12.716	4.318	1.018
534	11	18	12.394	4.343	1.024
12b	12	18	12.176	6.604	1.557
634	13	18	14.998	9.372	2.209
157	14	18	14.434	6.505	1.533
69	15	18	16.704	10.614	2.502
321	16	18	11.187	4.291	1.011

LSD (5%) 2.95

**A.3808**

**(2b)**

.( / )

11	11.71	10	13.21	10	11.27	10	10.66	
13	11.23	11	12.88	15	9.74	9	11.08	477
15	10.84	14	11.26	11	11.14	12	10.12	205
16	9.02	16	9.31	7	11.76	16	6.03	351
10	11.79	9	13.27	6	12.18	13	9.93	619
12	11.47	7	13.8	4	12.84	15	7.76	638
2	15.36	1	23.21	13	10.02	5	12.84	496
9	11.98	13	11.93	12	10.33	4	13.69	346
4	14.63	5	17.04	9	11.39	3	15.47	193
6	12.72	15	11.22	1	14.88	8	12.05	90
7	12.39	8	13.52	2	13.03	11	10.64	534
8	12.18	6	14.67	16	9.55	7	12.31	12b
3	15	3	18.58	14	9.99	2	16.42	634
5	14.43	2	18.67	5	12.18	6	12.46	157
1	16.7	4	17.07	3	12.95	1	20.1	69
14	11.19	12	12.19	8	11.73	14	9.64	321
	12.67		14.49		11.56		11.95	
	2.95		5.21		3.31		6.49	LSD
	***		***		NS		*	

0.001 0.05

\*\*\*

NS



(3)

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(3)

(n = 288) .

	ht	Br	nod m	nod s	pod m	pod s	100 seed wt	t pod	Seed pod	Yield	Seed No.
Br	0.02										
	NS										
nod m	0.48	0.12									
	***	*									
nod s	0.08	0.87	0.20								
	NS	***	***								
pod m	0.55	0.33	0.73	0.46							
	***	***	***	***							
pod s	0.08	0.77	0.20	0.95	0.48						
	NS	***	***	***	***						
100 seed wt	0.26	-0.19	0.09	-0.20	0.03	-0.18					
	***	***	NS	***	NS	**					
t pod	0.33	0.67	0.50	0.85	0.82	0.90	-0.10				
	***	***	***	***	***	***	NS				
Seed pod	0.14	0.32	-0.03	0.33	0.14	0.25	0.02	0.23			
	**	***	NS	***	**	***	NS	***			
Yield	0.42	0.42	0.49	0.53	0.75	0.58	0.20	0.67	0.31		
	***	***	***	***	***	***	***	***	***		
Seed No	0.29	0.70	0.43	0.87	0.75	0.90	-0.11	0.97	0.41	0.78	
	***	***	***	***	***	***	NS	***	***	***	
Earlines	0.42	0.45	0.18	0.48	0.41	0.43	0.01	0.48	0.34	0.39	0.52
	***	***	***	***	***	***	NS	***	***	***	***

0.001 0.01 0.05 \*\*\* \* \* NS

T pod	Br	Yield
100-seed wt.	100	Nod .m
Pod.S	Nod.S	Earlines
	Pod .m	Seed/pod /
		Seed no

Stepwise regression analysis

(4)

Stepwise regression analysis

(4)

A3803

R2			
0.42	1		-1
0.55	2		
0.58	3		
0.61	4	100	
0.64	5		
0.64	6		
0.61	1		-2
0.66	2	100	
0.69	3		
0.73	4		
0.43	1		-3
0.61	2		
0.74	3		
0.78	4		
0.3	1		-4
0.43	2	100	
0.5	3		
0.57	4		
0.59	5		

F

(5)

A3803

(AXB)

(AXBXC)

(BXC)

(AXC)

الجدول (5) نتائج اختبار F لمعوية مربعات المتوسطات من تحليل التباين لسلاسل الصنف A3803 المزروعة في جميع المواقع .

الإنتاجية الباكورية	عدد البذور بالقرون	عدد القرون الكلية	وزن المعنة بذرة الكلية	عدد البذور الكلية	عدد القرون الثانوية	عدد القرون بالأساق الرئيسية	عدد القرون بالأساق الرئيسية	عدد العقد بالأساق الرئيسية	عدد العقد بالأساق الرئيسية	عدد التفريعات	الطول (سم)	درجة الحرية	مصدر الاختلافات
***	***	***	***	NS	***	***	**	NS	***	**	NS	15	A
***	***	***	***	***	***	***	***	***	***	***	***	2	(B)
*	***	***	***	NS	***	*	*	NS	NS	NS	NS	30	(B)×(A)
***	***	***	***	NS	***	***	***	NS	NS	***	***	1	(C)
NS	***	***	***	NS	***	*	**	NS	NS	NS	NS	15	(C)×(A)
***	***	***	***	***	***	***	***	***	***	***	***	2	(C)×(B)
*	***	***	**	NS	***	**	**	*	NS	NS	NS	30	A×B×C

NS غير معنوي، \*، \*\*، \*\*\* معنوي على درجة ثقة 0.05، 0.01، 0.001 على التوالي

)  
 ( )  
 ( × ) ( × × )  
 (1a ) ( × )  
 .(2a )  
 AXB AXC ( )  
 A3803 AXBXC BXC

13 496 90  
 .69  
 Residual effect

(R2 = 0.1\*\*\*) (R2 = 0.56\*\*\*)  
 . (R2=0.01 Ns 0.04\*\*\*)

12 Board *et al* (1996)  
 (91 50)

Akhter and Sneller

(Isolines)

Ashley and Boerma (1988)

.(r=-0.55)

( )

Kane and Grabau (1992)

.Boeram and Ashley (1988)

Hartwig (1970)

45

Board (1985)

42 37

( )

Hanson (1992)



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