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EVALUATION OF SOME PEANUT PROMISING LINES UNDER DIFFERENT ENVIRONMENTAL CONDITIONS

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ABSTRACT

Seventeen peanut promising lines as well as the commercial cultivar Giza 5 were evaluated for yield and its components at six field experiments in Shandaweel Agricultural Research Stations d-uring the summer seasons of 2005 through 2008 and Assuit Agricultural Research Stations during the summer seasons of 2007 and 2008. The ordinary analyses of variance for the individual environments and its combined analysis showed that genotype mean squares were highly significant for all studied traits i.e., pod yield plant-1, seed weight plant-1, shelling percentage, 100-pod weight, 100-seed weight and pod yield plot-1. The effects of environments were highly significant on all studied traits. The interaction effect of environments x genotypes was highly significant for all studied traits. Values of studied traits showed wide differences among genotypes to give a good chance for selecting new high yielding genotypes as Suhag107 and Suhag 104. Pod yield plant-1 was significantly correlating with all studied traits except 100-seed weight.

Key words: ***Peanut, Peanut quality, Peanut productivity, Economic traits***

INTRODUCTION

Peanut (*Arachis hypogaea* L.) is a summer legume crop grown mainly for its vegetable oil and secondly its seed, used as food marks. The cultivated peanut is probably originated in Bolivia, South America along the eastern slopes of the Indies (Krapovickas 1968). The cultivated area in Egypt was 61442 hectare (147460 fadden) and produced 208835 tons in 2008 season (FAO Stat. Database Results of FAO 2008). Manivel et al (2000) reported that a peanut genotype had the highest pod yield (2886 kg/ha) outyielding all the controls for both components. Shelling percentage ranged from 58.2% to 70.7% while 100-kernel weight ranged from 53.9 to 76.7 g. Two genotypes were rated as the best based on comparable pod/kernel yield and low oil content compared to the controls. Abd-Alla and El-Sawy (2003) found that groundnut lines significantly varied in laboratory and field characters. One genotype recorded the highest values for weight of pods plant-1 and 100-seed weight while other genotypes gave the highest values for weight of seed plant-1, shelling percentage and 100-pod weight.

The main objective of this investigation was to evaluate some promising lines released in Shandaweel Research Station through peanut breeding program.

MATERIALS AND METHODS

Six field experiments were carried out during the summer seasons of 2005, 2006, 2007 and 2008 at Shandaweel and 2007 and 2008 at Assuit

Agricultural Research Stations, ARC using seventeen peanut promising lines (F13) that were selected and originated from 28 hybrid populations in a previous breeding program (Abo Elezz 1998 and 2005) and the commercial cultivar Giza 5, (Table 1).

Table1. Name of the 18 entries and the testing locations in the period from 2005 through 2008.

Genotypes						Environments	
No	Name	No	Name	No	Name	No	Name
1	Giza 5	7	Suhag119	13	Suhag115	1	Shandaweel 2005
2	Suhag123	8	Suhag120	14	Suhag101	2	Shandaweel 2006
3	Suhag116	9	Suhag111	15	Suhag102	3	Shandaweel 2007
4	Suhag106	10	Suhag112	16	Suhag103	4	Assuit 2007
5	Suhag107	11	Suhag121	17	Suhag104	5	Shandaweel 2008
6	Suhag118	12	Suhag114	18	Suhag105	6	Assuit 2008

The experimental design was a randomized complete block with three replications. Plot was 3 rows, 4 m long and 60 cm apart with an area of 7.2 m^2. Seeds were sown at 10 cm between hills on 15 May in each season. At harvest, a random sample of ten plants was taken from each plot to determine the following traits: pod yield plant-1 (g), seed weight plant-1, shelling percentage, 100-pod weight, 100-seed weight and pod yield plot-1 (kg) were recorded on plot basis. Separate analysis of variance was computed for each environment and then combined analysis was made according to Steel and Torrie (1980). LSD test was used for mean comparisons. The combined analysis for the six environments was carried out after making the homogeneity test of error. Correlation coefficient (r) was estimated for yield and yield attributes. Phenotypic coefficient of variation (P.C.V.) and genotypic coefficient of variation (G.C.V.) were also estimated.

RESULTS AND DISCUSSION

The analysis of variance for each environment and the combined analysis of the six environments for yield and its components are presented in Table (2). Environment mean squares were significant for all traits, indicating that these traits differed from one environment to another.

Genotypes mean squares were significant for yield and its components indicating that genotypes differed genetically and give a good chance to select the more suitable and highest yielding ones. Also, significant mean squares for interaction between genotypes × environments were detected for yield and yield components.

Table 2. Mean squares from ordinary analysis in the six environments for yield and its components.

Traits	S.o.V	df		Mean squares						
		Sin	Comb.	Env.1	Env.2	Env.3	Env.4	Env.5	Env.6	Comb.
pod weight plant⁻¹ (g)	Environments	-	5	-	-	-	-	-	-	42952.88**
	Reps per Env.	2	12	1.24	8.17	44.81	14.54	48.85	113.82*	38.57
	Genotypes	17	17	666.01**	1016.11**	814.99**	1278.73**	625.83**	714.72**	2563.58**
	Geno./Env.	-	85	-	-	-	-	-	-	720.14**
	Error	34	204	45.28	43.46	38.21	131.06	70.09	30.82	59.82
Seed weight plant⁻¹ (g)	Environments	-	5	-	-	-	-	-	-	21932.54**
	Reps per Env.	2	12	3.13	22.02	14.29	13.67	25.74	63.03*	23.64
	Genotypes	17	17	369.87**	573.98**	513.43**	521.80**	307.61**	357.73**	1396.36**
	Geno./Env.	-	85	-	-	-	-	-	-	249.61**
	Error	34	204	21.20	25.37	18.28	72.90	32.62	17.1	31.24
Shelling %	Environments	-	5	-	-	-	-	-	-	144.50**
	Reps per Env.	2	12	1.25	3.73	0.44	1.12	2.66	0.54	1.62
	Genotypes	17	17	5.60**	8.71**	7.51**	17.77**	9.75**	9.46**	14.55**
	Geno./Env.	-	85	-	-	-	-	-	-	8.85**
	Error	34	204	0.85	1.39	0.76	3.30	3.77	1.51	1.93
100-pod weight (g)	Environments	-	5	-	-	-	-	-	-	40059.66**
	Reps per Env.	2	12	282.08	46.82	40.88	989.54	239.67	156.82	292.64
	Genotypes	17	17	1706.59**	2247.03**	2133.91**	1367.96**	821.69**	1314.42**	5574.81**
	Geno./Env.	-	85	-	-	-	-	-	-	803.36**
	Error	34	204	538.10	128.78	110.69	432.80	259.44	273.20	290.50
100-seed weight (g)	Environments	-	5	-	-	-	-	-	-	1929.99**
	Reps per Env.	2	12	12.14	16.40	3.64	24.21	93.67	11.99	27.01
	Genotypes	17	17	190.68**	256.30**	253.45**	182.24**	130.37**	124.62**	718.23**
	Geno./Env.	-	85	-	-	-	-	-	-	83.89**
	Error	34	204	34.47	22.99	11.57	15.83	39.78	46.31	28.49
Pod yield plot⁻¹ (Kg)	Environments	-	5	-	-	-	-	-	-	130.45**
	Reps per Env.	2	12	0.66**	0.01	0.12	0.05	0.10	0.02	0.16
	Genotypes	17	17	0.82**	2.98**	2.41**	1.16**	0.37**	0.34**	1.87**
	Geno./Env.	-	85	-	-	-	-	-	-	1.24**
	Error	34	204	0.12	0.13	0.15	0.18	0.04	0.04	0.11

*,** significant and highly significant at 0.05 and 0.01 probability levels, respectively.

Env.1 = Shandaweel 2005. Env.2= Shandaweel 2006. Env.3= Shandaweel 2007.
Env.4 = Assuit 2007. Env.5= Shandaweel 2008. Env.6= Assuit 2008.

Means of yield and its components as affected by different environments and different genotypes are given in Table (3). Results showed that yield of tested genotypes were highest in environment 3 (Shandaweel 2007). The differences among genotypes regarding pod yield plant -1, seed weight plant-1, 100-pod weight, 100-seed weight, shelling percentage and pod yield plot-1 reached the significant levels (Table 3). Suhag 104 was the highest genotype for pod yield plant-1 and seed weight plant-1, Suhag 107 was the highest genotype for 100-pod weight, 100-seed weight and pod yield plot-1, while, Suhag 105 was the highest genotype for shelling percentage (Table 3). Several researches reported that peanut genotypes differed widely in their yielding ability (Sibuga et al 1989, Dwivedi and Nigam 1990, Alam 1991, Abilay and Lantlcan 1996 and Banterng et al 2006). Their results and conclusions support the present trends.

The interaction effect of environment and genotype was statistically significant for yield and its components (Table 4). These interaction effects were mainly caused by the different response of genotypes from one environment to the other. Genotype Suhag 116 had the highest values for pod yield plant-1 and seed weight plant-1 in Assiut in 2007. Suhag 107 had the highest values for shelling percentage, 100-pod weight, 100-seed weight and pod yield plot-1 in Shandaweel in 2008, (Env.4 and Comb.), (Env.1, Env.5 and Comb.) and (Env.2, Env.3, and Comb.), respectively. Suhag 118 had the highest values for pod yield plant-1 in Shandaweel in 2oo5. Suhag 119 had the highest values for shelling percentage and pod yield plot-1 in environment in Assuit in 2008. Suhag 120 had the highest values for pod yield plant-1 and seed weight plant-1 in Shandaweel in 2006. Suhag 111 had the highest values for pod yield plot-1 in Assuit in 207. Suhag 112 had the highest values for shelling percentage and pod yield plot-1 in Shandaweel in 2006 and in the same location in 2008, respectively. Suhag 121 had the highest values for shelling percentage in Shandaweel in 2005. Suhag 101 had the highest values for 100-pod weight and pod yield plot-1t in environment 5 and 1, respectively. Suhag 104 had the highest values for pod yield plant-1, seed weight plant-1, shelling percentage, 100-pod weight and 100-seed weight in environments 3, 5, 6 and the combined analysis.), (Env.3, Env.5, Env.6 and Comb.), (Env.3), (Env.1 and Env.3), and (Env.3 and Env.6), respectively. Suhag 105 had the highest values for shelling percentage, 100-pod weight and 100-seed weight in environments (Env.4 and Comb.), (Env.2 and Env.6), (Env.2), respectively, (Table 4). The differences of genotypes in different environments indicating the environmental effects on the genetic behavior of genotypes which were reported by several authors. These results were similar with that reported by El-Sawy (1988), Sibuga *et al* (1989) and Nigam and Dwevidi (1990).

Table 3. The combined main effect of environments and genotypes on yield and its components.

No.	Main effect of	pod yield plant^{-1}(g)	Seed weight plant^{-1} (g)	Shelling %	100-pod weight(g)	100-seed weight(g)	Pod yield plot^{-1} (Kg)
			Environments				
1	Shandaweel 2005	117.27	80.08	68.21	274.26	102.03	5.67
2	Shandaweel 2006	125.20	86.89	69.30	243.97	95.34	5.89
3	Shandaweel 2007	133.60	92.31	68.97	247.61	97.99	5.93
4	Assuit 2007	92.84	61.40	66.15	232.28	97.47	3.54
5	Shandaweel 2008	72.07	47.32	65.49	191.89	89.03	2.63
6	Assuit 2008	66.93	46.26	69.07	226.66	106.65	2.97
	F-test	**	**	**	**	**	**
	LSD $_{0.05}$	2.60	2.04	0.53	7.17	2.18	0.17
			Genotypes				
1	Giza4	89.28	60.18	67.42	230.50	88.18	4.09
2	Suhag123	101.18	69.04	68.01	214.31	100.74	4.15
3	Suhag 116	108.85	73.29	67.65	250.33	102.45	4.10
4	Suhag 106	108.66	74.33	68.49	244.39	97.05	4.50
5	Suhag 107	112.60	77.63	68.11	274.73	109.51	4.99
6	Suhag 118	97.30	66.60	67.87	223.01	92.51	4.77
7	Suhag 119	83.57	56.53	67.30	224.13	91.45	4.22
8	Suhag 120	102.09	70.11	68.29	222.93	93.17	4.81
9	Suhag 111	101.71	69.95	68.48	216.00	93.09	4.76
10	Suhag 112	110.84	75.84	67.98	228.23	99.78	4.58
11	Suhag 121	114.17	78.25	68.25	217.23	90.17	4.71
12	Suhag 114	98.08	66.04	67.22	239.63	96.55	4.26
13	Suhag 115	97.59	66.81	68.37	220.97	93.64	4.37
14	Suhag 101	97.95	64.72	66.21	244.60	100.30	4.58
15	Suhag 102	85.17	57.33	67.00	235.15	100.35	4.06
16	Suhag 103	84.26	55.76	66.08	239.58	101.00	3.79
17	Suhag 104	130.65	90.92	69.37	263.65	109.17	4.55
18	Suhag 105	99.77	69.42	69.42	260.59	106.41	4.56
	F-test	**	**	**	**	**	**
	LSD $_{0.05}$	4.90	3.54	0.88	10.79	3.38	0.21

*,** significant and highly significant at 0.05 and 0.01 probability levels, respectively.

Table 4. Means of the interaction effect for environments and genotypes on yield and its components in peanut.

Traits	Genotypes	Env.1	Env.2	Env.3	Env.4	Env.5	Env.6	Comb.
Pod yield plant⁻¹ (g)	Giza5	112.22	117.13	124.13	73.67	56.99	51.55	89.28
	Suhag123	108.23	116.30	132.85	101.29	76.26	72.18	101.18
	Suhag 116	107.44	114.37	121.12	145.07	92.90	72.20	108.85
	Suhag 106	126.16	135.43	140.71	89.433	86.36	73.87	108.66
	Suhag 107	141.09	147.34	162.47	66.74	90.56	67.42	112.60
	Suhag 118	141.12	105.90	147.43	80.40	57.03	51.89	97.30
	Suhag 119	91.35	97.57	111.67	73.80	49.64	77.35	83.57
	Suhag 120	103.89	163.99	120.62	84.83	65.62	73.57	102.09
	Suhag 111	118.95	126.31	135.61	109.87	50.43	59.12	101.71
	Suhag 112	125.89	131.38	134.63	107.30	76.21	89.65	110.84
	Suhag 121	129.19	136.02	142.48	116.83	87.82	72.65	114.17
	Suhag 114	110.02	115.26	128.11	100.37	81.67	53.04	98.08
	Suhag 115	123.27	133.34	142.99	77.167	59.27	39.48	97.59
	Suhag 101	116.55	120.18	119.64	82.43	59.61	89.28	97.95
	Suhag 102	97.99	103.65	119.55	77.37	56.14	54.30	85.17
	Suhag 103	99.78	105.89	114.91	74.60	62.17	48.22	84.26
	Suhag 104	140.05	158.01	174.80	120.03	96.53	94.49	130.65
	Suhag 105	117.72	125.42	131.12	89.97	69.98	64.43	99.77
LSD 0.05		**11.22**	**10.99**	**10.31**	**19.09**	**13.96**	**9.26**	**12.00**
CV		**5.74%**	**5.27%**	**4.63%**	**12.33%**	**11.62%**	**8.30%**	**7.63%**
Seed weight plant⁻¹ (g)	Giza5	74.83	80.06	83.52	49.69	34.72	36.23	60.18
	Suhag123	72.99	80.74	94.18	66.20	45.59	49.23	69.04
	Suhag 116	73.74	80.42	84.24	90.50	60.55	50.29	73.29
	Suhag 106	85.57	91.38	97.60	62.11	57.09	52.2	74.33
	Suhag 107	98.23	103.48	115.05	44.08	62.40	42.52	77.63
	Suhag 118	97.32	73.60	103.64	53.14	35.49	36.40	66.60
	Suhag 119	61.64	67.28	75.68	48.33	31.43	54.84	56.53
	Suhag 120	71.32	116.02	81.84	57.14	42.62	51.71	70.11
	Suhag 111	81.96	89.34	94.11	73.53	40.93	39.82	69.95
	Suhag 112	87.36	94.38	92.36	70.77	48.88	61.26	75.84
	Suhag 121	90.62	95.92	98.84	77.[illegible]4	54.27	50.33	78.25
	Suhag 114	73.93	78.95	87.46	66.60	53.19	36.09	66.04
	Suhag 115	85.19	93.42	97.08	52.15	45.54	27.50	66.81
	Suhag 101	75.33	77.48	78.39	55.53	39.22	62.38	64.72
	Suhag 102	67.10	71.63	82.79	46.47	38.33	37.66	57.33
	Suhag 103	66.19	71.04	77.01	47.81	39.25	33.26	55.76
	Suhag 104	9[illegible].04	111.35	125.38	79.74	65.56	66.45	90.92
	Suhag 105	81.01	87.49	92.34	63.81	47.36	44.52	69.42
LSD 0.05		**7.68**	**8.40**	**7.13**	**14.24**	**9.52**	**6.89**	**8.67**
CV		**5.75%**	**5.80%**	**4.63%**	**13.91%**	**12.07%**	**8.94%**	**8.10%**
Shelling %	Giza5	66.79	68.30	67.28	67.45	64.45	70.26	67.42
	Suhag123	67.41	69.38	70.92	65.25	66.83	68.24	68.01
	Suhag116	68.61	70.35	69.60	62.34	65.33	69.68	67.65
	Suhag 106	67.85	67.50	69.37	69.51	66.05	70.66	68.49
	Suhag 107	69.62	70.22	70.83	66.01	68.87	63.10	68.11
	Suhag 118	68.96	69.54	70.30	66.11	62.20	70.12	67.87
	Suhag 119	67.48	68.95	67.79	65.53	63.16	70.88	67.30
	Suhag 120	68.69	70.66	67.81	67.30	65.02	70.25	68.29
	Suhag 111	68.91	70.75	69.39	66.85	67.61	67.37	68.48
	Suhag 112	69.38	71.82	68.60	65.73	64.15	68.21	67.98
	Suhag 121	70.13	70.48	69.36	66.36	63.99	69.19	68.25
	Suhag 114	67.16	68.48	68.30	66.17	65.09	68.10	67.22
	Suhag 115	69.18	70.09	67.90	67.6[illegible]	65.75	69.68	68.37
	Suhag 101	64.64	64.46	65.54	67.33	65.53	69.83	66.21
	Suhag 102	68.50	69.12	69.23	59.9[illegible]	65.90	69.33	67.00
	Suhag 103	66.33	67.06	67.04	63.87	63.33	68.85	66.08
	Suhag 104	69.30	70.45	71.73	66.40	68.03	70.33	69.37
	Suhag 105	68.80	69.72	70.43	70.90	67.51	69.16	69.42
LSD 0.05		**1.54**	**1.97**	**1.45**	**3.03**	**3.24**	**2.05**	**2.15**
CV		**1.35%**	**1.70%**	**1.26%**	**2.74%**	**2.96%**	**1.78%**	**2.05%**

Table 4: Cont.

Traits	Genotypes	Env.1	Env.2	Env.3	Env.4	Env.5	Env.6	Comb.
100pod weight (g)	Giza5	292.00	242.77	242.87	221.17	192.87	191.33	230.50
	Suhag123	277.17	203.04	209.28	218.71	159.28	218.39	214.31
	Suhag 116	308.2	246.85	247.60	256.26	197.62	245.45	250.33
	Suhag 106	308.23	238.17	242.84	244.85	187.95	244.31	244.39
	Suhag 107	309.27	292.91	295.57	281.13	213.75	255.76	274.73
	Suhag 118	250.77	231.76	234.92	194.18	208.29	218.13	223.01
	Suhag 119	254.30	231.08	235.37	210.38	171.39	242.27	224.13
	Suhag 120	258.40	235.08	240.28	218.30	189.96	195.53	222.93
	Suhag 111	245.20	221.75	224.63	217.15	195.57	191.71	216.00
	Suhag 112	252.27	235.10	237.66	227.74	175.73	240.91	228.23
	Suhag 121	265.57	210.70	216.78	206.89	201.11	202.31	217.23
	Suhag 114	255.17	269.05	272.25	233.06	171.34	236.93	239.63
	Suhag 115	293.83	206.00	212.93	230.36	166.26	216.46	220.97
	Suhag 101	262.60	253.41	257.76	248.60	213.80	231.41	244.60
	Suhag 102	247.90	251.41	254.22	228.90	202.77	225.72	235.15
	Suhag 103	262.83	241.88	243.87	261.39	198.25	229.27	239.58
	Suhag 104	312.50	285.18	299.00	244.43	205.02	235.76	263.65
	Suhag 105	280.50	295.23	289.13	237.49	202.99	258.19	260.59
LSD 0.05		**38.68**	**18.92**	**17.54**	**34.69**	**26.86**	**27.56**	**26.44**
CV		**8.46%**	**4.65%**	**4.25%**	**8.96%**	**8.39%**	**7.29%**	**7.22%**
100seed weight (g)	Giza5	93.45	90.80	88.69	85.36	78.97	91.81	88.18
	Suhag123	105.66	97.93	101.84	95.29	92.09	111.63	100.74
	Suhag 116	112.38	91.37	96.50	110.79	92.12	111.52	102.45
	Suhag 106	99.65	89.92	95.44	104.81	88.46	104.06	97.05
	Suhag 107	120.56	104.50	111.69	104.89	99.89	115.53	109.51
	Suhag 118	93.62	92.95	95.48	89.27	82.84	100.88	92.51
	Suhag 119	98.57	85.80	89.41	90.85	79.12	104.97	91.45
	Suhag 120	94.29	88.29	89.80	98.67	86.90	101.09	93.17
	Suhag 111	94.86	89.37	90.76	93.35	83.69	106.50	93.09
	Suhag 112	97.47	105.38	106.63	100.24	83.34	105.63	99.78
	Suhag 121	98.23	75.90	82.37	102.52	83.64	98.35	90.17
	Suhag 114	91.46	98.40	102.07	89.27	87.55	110.58	96.55
	Suhag 115	104.68	91.12	93.15	82.67	90.14	100.05	93.64
	Suhag 101	106.62	96.48	96.95	95.59	98.62	107.51	100.30
	Suhag 102	101.61	100.67	101.31	100.89	86.43	111.19	100.35
	Suhag 103	112.44	93.45	94.61	100.03	94.04	111.43	101.00
	Suhag 104	109.72	108.23	119.54	102.55	98.41	116.55	109.17
	Suhag 105	101.20	115.55	107.62	107.37	96.38	110.36	106.41
LSD 0.05		**9.79**	**7.99**	**5.67**	**6.63**	**10.52**	**11.35**	**8.28**
CV		**5.75%**	**5.03**	**3.47%**	**4.08%**	**7.08%**	**6.38%**	**5.44%**
Pod yield plot^{-1} (Kg)	Giza5	6.00	5.18	5.60	3.00	2.10	2.67	4.09
	Suhag123	5.27	5.28	5.25	3.57	3.03	2.53	4.15
	Suhag 116	5.10	4.59	4.55	4.73	2.88	2.77	4.10
	Suhag 106	4.35	6.93	6.72	3.64	2.27	3.1	4.50
	Suhag 107	5.30	7.89	7.66	3.36	2.66	3.07	4.99
	Suhag 118	5.93	6.95	6.80	3.14	2.49	3.30	4.77
	Suhag 119	5.84	4.72	5.19	3.65	2.05	3.87	4.22
	Suhag 120	5.70	7.23	6.58	3.47	2.70	3.17	4.81
	Suhag 111	5.60	6.32	5.82	5.18	2.75	2.87	4.76
	Suhag 112	6.07	5.98	5.65	3.62	3.21	2.97	4.58
	Suhag 121	5.87	6.79	6.53	3.57	2.56	2.97	4.71
	Suhag 114	5.53	5.44	5.46	3.34	2.62	3.17	4.26
	Suhag 115	6.20	5.88	5.73	3.75	2.41	2.27	4.37
	Suhag 101	6.40	5.77	5.54	3.79	2.83	3.13	4.58
	Suhag 102	4.87	5.74	5.79	3.04	2.08	2.83	4.06
	Suhag 103	5.80	4.66	4.29	2.42	2.60	2.97	3.79
	Suhag 104	6.17	4.45	7.42	3.33	3.15	2.80	4.55
	Suhag 105	6.03	6.23	6.08	3.04	2.95	3.03	4.56
LSD 0.05		**0.58**	**0.59**	**0.65**	**0.70**	**0.34**	**0.34**	**0.51**
CV		**6.11%**	**6.04%**	**6.55%**	**11.90%**	**7.72%**	**6.78%**	**7.45%**

Env.1 = Shandaweel 2005. Env.2= Shandaweel 2006. Env.3= Shandaweel 2007.
Env.4 = Assuit 2007. Env.5= Shandaweel 2008. Env.6= Assuit 2008.

Several researchers had examined procedures that could be used in peanut breeding to evaluate the significant interaction between a genotype and an environment. Procedures identified include pattern analysis (Shorter and Hammons 1985), moving mean covariance adjustments (Shorter and Butler 1986) and distance parameters and regression analysis for stability estimates (Anderson et al 1989).

Simple correlation coefficients among yield and its components are presented in Table (5). Besides, phenotypic and genotypic correlation coefficients are given in Table (6). Pod yield plant-1 showed significant correlation with seed weight plant-1, shelling percentage, 100-pod weight and Pod yield plot-1, indicating that these characters can be taken into consideration in selecting high yielding peanut lines. These results were in accordance with those reported by El-Sawy and El-Mandoh (2003).

Table 5. Correlation coefficients among yield and its components (combined over all environments).

Traits	Pod yield plant^{-1} (g)	Seed weight plant^{-1} (g)	Shelling %	100-pod weight (g)	100-seed weight (g)	Pod yield plot^{-1} (kg)
Pod yield plant^{-1}	--	0.994**	0.355**	0.487**	0.110	0.840**
Seed weight plant^{-1}		--	0.447**	0.488**	0.126	0.846**
Shelling %			--	0.229**	0.238**	0.397**
100 pod weight				--	0.540**	0.532**
100 seed weigh					--	0.089

*,** significant and highly significant at 0.05 and 0.01 probability levels, respectively.

Table 6. Phenotypic coefficient of variation (P.C.V.) and genotypic coefficient of variation (G.C.V.) for yield and its components on the six environments.

Traits		Env.1	Env.2	Env.3	Env.4	Env.5	Env.6	Comb.
Pod yield plant^{-1} (g)	P.C.V.	12.27	14.38	12.04	21.07	18.89	22.56	28.51
	G.C.V.	13.54	15.32	12.90	24.41	22.17	24.04	29.52
Seed weight plant^{-1} (g)	P.C.V.	13.46	15.56	13.92	19.98	20.24	23.03	30.90
	G.C.V.	14.64	16.61	14.67	24.30	23.57	24.71	31.94
Shelling %	P.C.V.	1.84	2.25	2.17	3.32	2.16	2.36	3.02
	G.C.V.	2.29	2.82	2.52	4.31	3.66	2.95	3.65
100 pod weight(g)	P.C.V.	7.20	10.89	10.49	7.60	7.13	8.22	17.78
	G.C.V.	11.10	11.84	11.32	11.75	11.02	10.99	19.19
100 seed weight(g)	P.C.V.	7.07	9.25	9.16	7.64	6.17	4.79	15.46
	G.C.V.	9.12	10.53	9.80	8.66	9.40	7.98	16.39
Pod yield plot^{-1} (kg)	P.C.V.	8.52	16.56	14.63	16.17	12.59	10.63	17.26
	G.C.V.	10.48	17.63	16.03	20.07	14.76	12.63	18.81

REFERENCES

Abd-Alla, M.M. S. and W.A. El-Sawy (2003). Laboratory and yield evaluation of peanut seed quality. Annals of Agric. Sci., Moshtohor 41 (2) 537-553.

Abilay, R.M. and L.A. Lantlcan (1996). On farm trials in peanut (Arachis hypogaea, L.). Philippine J. of Crop Sci. 12 (1) 6

Abo Elezz A.A. (1998). Studies of combining ability and gene action in peanut (Arachis hypogaea, L.). M.Sc. Thesis, Fac. Agric. Assiut University, Egypt.

Abo Elezz A.A. (2005). Comparative studies on pedigree and bulk selection in peanuts. Ph.D. Thesis, Fac. Agric. Assiut University, Egypt.

Alam, M.S. (1991). Varietal improvement of groundnut through selection breeding. Proceedings of the workshop on Bangladesh Agric. Univ. Res. Progress. (Bangladesh). BAU: 63-66.

Allard, R.W. (1999). Principles of plant breeding. 2nd ed. New York London; John Liviiey and Sons, Inc.

Anderson, W.F., R.W. Mozingo and J.C. Wynne (1989). Comparison of stability statistics as criteria for cultivar development in peanut. Peanut Sci. 16: 21-25.

Banterng, P., A. Patanothai, K. pannangpetch, S. Jogloy and G. Hoogenboom (2006). Yield stability evaluation of peanut lines: a comparison of an experimental versus a simulation approach. Field Crops Research 96 (1) 168-175.

Dwivedi, S.L. and S.N. Nigam (1990). Groundnut breeding progress report 2/90. Third international confectionery groundnut varietal trial, January 1987 - December 1989. Patancheru, A.P. (India). ICRISAT48.

El-Sawy, W.A. (1988). Evaluation of some peanut varieties. M. Sc. Thesis, Fac. Agric. Moshtohor, Zagazig University. Benha Branch. Egypt.

El-Sawy, W.A. and El-Mandoh, M.E. (2003). Screening some peanut genotypes for yield potentiality, pod and seed characters. Proc. 10th Conf. Agron., Suez Canal Univ., Fac., Environ., Agric., Sci. El-Arish. Egypt Soc. Agron.: 673-688.

Http//:FAO Stat.Fao.org. Database Results of FAO 2008.

Krapovickas, (1968). The origin, variability and spread of the groundnut (Arachis hypogaea, L). P.427-441. In P. J. Ucko and I. S. Falk (eds)

Manivel, P., R. K. Mathur, A. Bandyopadhyay, M. y. Samdur and J. B. Misra (2000). Evaluation of some confectionery type advanced breeding lines of groundnut. International Arachis Newsletter 20: 20-22.

Nigam, S.N. and S.L. Dwivedi (1990). Third international medium and late maturing groundnut varietal trial. Groundnut breeding progress report 1/ 90. Patancheru, A.P. (India). ICRISAT, 48 P.

Shorter, R. and D. Butler (1986). Effect of moving mean covariance adjustments on error and genetic variance estimates and selection of superior lines in peanuts (Arachis hypogaea, L.). Euphytica 35: 185-192.

Shorter, R. and R.O. Hammons (1985). Pattern analysis of genotype adaptation and genotype x environment interactions in the uniform peanut performance tests. Peanut Sci. 12: 35-41.

Sibuga, K.P., S.O.W.M. Reuben and A.L. Doto (1989). A progress report on the performance of advanced groundnut breeding lines in various agro-ecological zones of Tanzania. International Crops Research Inst. for the Semi Arid Tropics, Patancheru, A.P. (India). Proceedings of the third Regional Groundnut Workshop for Southern Africa, 13-18 Mar. 1988, Lilongwe.alawi. Patancheru, A.P. (India) ICRISAT: 99-103

Steel, R.G.D. and J.H. Torrie (1980). Principles and Procedures of Statistics. Mc Graw-Hill Book Company inc., New York, 280.

تقييم بعض السلالات المبشرة للفول السوداني تحت ظروف بيئية مختلفة

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قسم بحوث المحاصيل الزيتية – معهد بحوث المحاصيل الحقلية – مركز البحوث الزراعية

أجريت ست تجارب حقلية أربع منها بمحطة بحوث شندويل خلال الموسم الصيفي لأعوام 2005، 2006،2007 و 2008 واثنتان بمحطة بحوث أسيوط خلال الموسم الصيفي لعامي 2007 و 2008 وذلك لتقييم ثمانية عشرة تركيب وراثي منها سبعة عشرة سلالة مبشرة مقارنة بالصنف التجاري جيزة 5، لتحديد أفضل التراكيب الوراثية المبشرة للفول السوداني توافقا مع ظروف بيئية مختلفة. وقد تم في كل تجربة تسجيل البيانات على عشرة نباتات من كل قطعة تجريبية لدراسة الصفات الآتية: محصول القرون للنبات (بالجرام)، وزن بذور النبات (بالجرام)، نسبة التصافي (%)، وزن 100 قرن (بالجرام)، وزن 100 بذرة (بالجرام) ومحصول القطعة التجريبية (بالكيلوجرام).

وأوضحت نتائج الدراسة ما يلي:

أظهر التأثير البيئي اختلاف معنوي لكل الصفات تحت الدراسة في جميع البيئـــات. وأوضـــح متوســـط مربعات التباين للتراكيب الوراثية وجود إختلافاً معنوياً بين التراكيب الوراثية لكل الصفات تحت الدراسة، ومن ذلك يتضح أن هذا التباين بين التراكيب الوراثية كان كافياً لإجراء الإنتخاب بين هذه التراكيب بغية التوصل إلي أفضلها.

أظهر التفاعل بين التراكيب الوراثية والبيئات وجود إختلافاً معنوياً في صفات المحصول ومكوناته نتيجة الاستجابة المختلفة للتراكيب الوراثية من بيئة لأخرى .

السلاله المبشره سوهاج 104 كانت اعلى التراكيب الوراثية بالنسبة لصفتى محصول القرون للنبات و وزن بذور النبات، السلاله المبشره سوهاج 107اعلى التراكيب الوراثية بالنسبة لصفات وزن 100 قرن (بالجرام)، وزن 100 بذرة (بالجرام) ومحصول القطعة التجريبية (بالكيلوجرام). بينما السلاله المبشره سوهاج 105 كانت اعلى التراكيب الوراثية بالنسبة لصفة نسبة التصافي (%).

من دراسة الإرتباط البسيط تبين أن هناك ارتباط معنوي موجب بين صفة محصول القرون للنبات وكل من صفات وزن بذور النبات ونسبة التصافي ووزن 100 قرن ومحصول القطعة التجريبية من القرون (كجم) عبر جميع البيئات.

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