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EVALUATION OF YIELD AND YIELD COMPONENTS OF NEWLY DEVELOPED FABA BEAN (*Vicia faba* L.) LINES AS AFFECTED BY SOME FOLIAR DISEASES

BY

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ABSTRACT

The present study was carried out during 2003/2004 and 2004/2005 growing seasons at Etay El-Baroud Agric. Res. St. Farm. Four faba bean (*Vicia faba* L.) lines named Etay L1, Etay L2, Etay L3 and Etay L4 produced from crosses (T.W x Nubaria 1), L502 x G 714, G 461 x (G 461 x R 40) and L 884 x (G461 x L 884), respectively and six commercial cultivars (Nubaria 1, Giza 843, Giza 461, Giza 716, Sakha 1 and Misr1) were evaluated for its resistance against chocolate spot and rust diseases severity and its agronomic characters under field conditions. Results cleared significant differences between the all tested genotypes. Etay L1 was promising for chocolate spot resistance and agronomic characters, so it would be exploited in faba bean improvement program.

INTRODUCTION

Faba bean (*Vicia faba* L.) is the most important leguminous crops in Egypt, where it is widely grown for seed production over the country (Anonymous, 2002).

Although faba bean in the Mediterranean region is attacked by more than 100 pathogens (Hebblethwaite, 1983), it is widely accepted that chocolate spot (*Botrytis fabae* Sard.), broomrape (*Orbanche crinata* Forsk.), stem nematode (*Ditylechus dipsaci* (Kuhn) Filipjev) and rust (*Uromyces vicia fabae* (Pres.) Schroet.), are the important limiting factors which cause great annual losses and sometimes complete crop failures (Hashim,1979; Ibrahim *et al.*, 1979; Hanounik and Sikora, 1980; Hanounik, 1982; Mohammed, 1982 and Cubero, 1983).

Normally, chocolate spot disease takes place early in the season before rust. Faba bean rust is of major importance in warm dry climates (Herath *et al.*,2001) and the Middle East and North Africa (Liang, 1986 and Rashid and Bernier, 1991) where moderate to substantial yield losses can occur particularly if the disease starts early in the season. Yield losses of both diseases was positively correlated with disease severity (Williams, 1975 and 1978). Seed yield loss due to chocolate spot disease was found to be 58 % (Abd El - Hak *et al.*, 1984). In

general, rust appears late in the season and causes an estimated 20 % loss in faba bean production (Bekhit *et al.*, 1970 and Mohammed, 1982). However, these losses could go up to 45 % (Williams, 1978) and from 27 to 80 % (Yeoman *et al.*, 1987 and Dobson and Giltrap, 1991) if severe infections occur early in the season.

Several strategies can be employed to control chocolate spot, including crop hygiene and breeding for disease resistance, but fungicides application is the most effective and widely used (Harrison, 1988). There are many pesticides which discarded due to their phytotoxicity (Fawcett and Spencer, 1970), long persistence period (Beye, 1978), teratogenicity (Javoraska, 1978), carcinogenicity (Epstein *et al.*, 1967) and pollutive effects (Dubey and Mall, 1972). These factors emphasize the need for new methods to control diseases (Williams *et al.*, 1978).

The recent strategy is directed toward minimizing the fungicidal use to reduce environmental pollution and keep human health. Faba bean resistant varieties is an important alternative way to be used (Hanounik, 1982; Khalil and Nassib, 1984; Salem *et al.*, 1992 and Khalil *et al.*, 1993). The efficiency of using host – resistant to increase and stabilize faba bean yield depends on well planned and coordinated germplasm evaluation and hybridization programs. Moreover, using appropriate procedures of breeding and selection would help to identify disease resistant segregates (Hamdi *et al.*, 2003). El-Hady (1988) referred to the presence of dominant genes for chocolate spot resistance in faba bean. Also, Hamdi *et al.*, (2003) reported that three faba bean crosses in F 5 named Giza 716 x Giza 843, Giza 461 x Giza 643 and Giza 716 x Giza 3 showed low chocolate spot disease and high yield/plant.

Several *Vicia faba* sources of incomplete resistance to *Uromyces vicia fabae* have been reported. In these sources, resistance is expressed as a reduction of disease severity without any macroscopically visible necrosis (Bernier and Conner, 1982; Furgal *et al.*, 1985; Khalil *et al.*, 1985; Rashid and Bernier, 1986 a, b and 1991 and Sillero, *et al.*, 2000). Also, Salliro and Rubiales (2002) reported that resistance was mainly due to a restriction of haustorium formation with varying levels of early abortion of the colonies, a reduction in the number of haustoria per colony, and smaller colony size.

The purpose of the present study to evaluate 4 faba bean lines and 6 commercial varities to resist both chocolate spot and rust diseases and have the best agronomic characters.

MATERIALS AND METHODS

The field experiments were carried out at Etay El – Baroud Agric. Res. Station Farm during seasons 2003/2004 and 2004/2005. Four faba bean lines and 6 commercial cultivars were evaluated under field conditions (Table1). Randomized complete block design with three replicates was used. Each experimental plot (9.0 m^2) had five ridges, 60 cm in between and three meters long. Planting took place on two sides/ridge with two seeds/hill, 20 cm a part.

Table (1): List of crosses and commercial varieties of faba bean (*Vicia faba* L.) used.

Genotype	Pedigree
Etay Line 1	T.W x Nubaria 1
Etay Line 2	L 502 x G 714
Etay Line 3	G 461 x (G 461 x R 40)
Etay Line 4	L 884 x (G 461 x L 884)
Nubaria 1	Selection from Giza Blanca
Giza 843	L 561/2076/85 x G 461/854/83
Giza 461	G 3 x ILB 938
Giza 716	461/842/83 x CARNS
Sakha 1	G 716 x H 620/283/85
Misr 1	G 3 x 123 P/45 76

Severity of chocolate spot and rust diseases due to natural infection were determined at 15th January and 1st March, respectively and each two weeks according to the key of Gondran (1977) for chocolate spot and the key of Bernier *et al.*, (1984) for rust disease as follows:

Chocolate spot disease severity:

1 = Healthy plants; 2 = Primitive spot; 3 = Increasing spots number; 4 = Spreading spots; 5 = Coalesce spots together; 6 = Some leaves fall; 7 = Half of plants 'leaves fall; 8 = Most of plants' leaves fall and 9 = All plants' leaves fall.

Rust severity:

1 = No pustules or very small non- sporulating flecks; 3 = Few scattered pustules covering less than 1 % of leaf area, and few or no pustules on stem; 5 = Pustules common on leaves covering 1 - 4 % of leaf area, little defoliation and some pustules on stem; 7 = Pustules very common on leaves, covering 4 - 8 % of leaf area, some defoliation, and many pustules on stem; 9 = Extensive pustules on leaves, petioles and stems, covering 8 - 10 % of leaf area, many dead leaves and severe defoliation.

$$D.S = \frac{\sum (\text{Number of infected plants} \times \text{Numerical grades})}{\text{Higher degree in the category} \times \text{Total number of the tested plants}} \times 100$$

During growing season some agronomic characters were estimated as: number of days to inflorescence, number of days to maturity, plant height (cm), number of branches/plant, first flower height (cm), first pod height (cm) and shedding %. At harvest, five guarded plants were taken at random from each experimental plot, on which the following characters were recorded: number of pods/plant, number of seeds/pod, 100 seed weight (g), seed yield/plant (g). Seed yield/plot (kg) was converted to seed yield/feddan (Ardab).

Statistical analyses of experimental data were done using the statistical software package SYSTAT 6. Analysis of variance was followed by comparison

of means for significant effect using LSD. Differences were considered to be significant at $P \leq 0.05$.

RESULTS AND DISCUSSION

The average disease severity (DS) with faba bean chocolate spot was significantly increased from 1st to 4th record period. Results revealed that, the differences between genotypes were significant and the lowest (DS) was obtained with G 716 in the first season and G 461 in the second one, but without significant superiority over Nubaria 1 in both seasons. The (DS) ranged from 2.38 with G 716 to 3.32 (Etay L4) in the first season and from 2.42 (G 461) to 3.28 (Etay L4) in the second season (Table 2).

Table (2): Chocolate spot disease severity of some faba bean genotypes under field conditions.

Season	2003/2004					2004/2005				
Period / Genotypes	1st	2nd	3rd	4th	$\bar{x}$	1st	2nd	3rd	4th	$\bar{x}$
Etay L1	1.30	2.67	3.40	4.40	2.94	1.97	2.57	2.97	3.97	2.87
Etay L2	1.23	3.17	3.33	3.90	2.91	1.63	2.47	3.50	4.07	2.92
Etay L3	1.43	3.00	2.93	4.50	2.97	1.90	2.77	3.47	3.90	3.01
Etay L4	1.60	3.83	3.00	4.83	3.32	1.70	2.97	3.67	4.77	3.28
Nubaria 1	1.03	3.00	2.57	3.30	2.48	1.37	2.07	3.03	3.97	2.61
Giza 843	1.37	3.10	3.00	4.17	2.91	1.57	3.37	3.47	3.90	3.08
Giza 461	1.70	3.07	2.73	3.97	2.87	1.23	1.90	2.90	3.63	2.42
Giza 716	1.57	2.33	2.53	3.10	2.38	1.80	3.07	3.57	3.77	3.05
Sakha 1	1.73	2.90	2.80	4.13	2.89	1.57	2.97	3.13	3.67	2.84
Misr 1	1.60	3.17	3.37	4.10	3.06	2.00	2.77	3.33	4.00	3.03
Mean	1.46	3.02	2.97	4.04	2.87	1.67	2.69	3.30	3.97	2.91
	A	B	AB			A	B	AB		
L.S.D. 0.05	0.27	0.42	N.S			0.19	0.31	0.61		

A: Period B: Genotype AB: Period x Genotype

C.V %: 17.90

Results revealed that chocolate spot severity level was markedly mild and did not reach the aggressive stage in the tested seasons, it may be due to the genotypes under study involved sources of resistance either as direct parental genotypes or ancestor of the previous stages of crossing exhibited high level of chocolate spot resistance as mentioned by El–Hady (1988) and El–Hady *et al.*, (1997). In addition to the different genetic sources, the reduction of the relative humidity (%) and the rainfall rate (mm) as it clear in Table (3) played an important role in decreasing the severity of chocolate spot (Harrison, 1988). Also, this result is in agreement with the results obtained by Hamdi *et al.*, (2003). The effect of interaction between period and genotypes was significant only in the second season. The lowest values were recorded by Nubaria 1 (1.03) in the 1st record period and G 716 (3.10) in the 4th one, in the first season and G 461 in the 1st and 4th record periods (1.23 and 3.63) in the second season, respectively.

Table (3): Maximum and minimum of temperature°C, average of relative humidity (%) and rainfall rate (mm) during 2003/2004 and 2004/2005 growing seasons@.

Month	Temperature °C		Relative humidity (%)	Rainfall rate (mm)
	Maximum	Minimum		
January 2004	17.5	8.8	59	56
February	19.6	8.8	63	27
March	21.7	10.4	58	--
April	25.5	12.2	55	--
Mean	**21.5**	**10.1**	**58.8**	**20.8**
January 2005	20.0	10.8	65	46
February	19.8	9.9	63	10
March	23.6	11.5	61	7
April	26.7	14.1	61	8
Mean	**22.5**	**11.6**	**62.5**	**17.8**

@ Central Laboratory of Agricultural Climate, Agric. Res. Center (2004 No. 85-88 and 2005 No. 98-101).

Results presented in Table (4) showed rust severity of faba bean. This severity was significantly increased from the 1st to the 3rd record period in both seasons, also the differences between genotypes were significant. The cultivars Nubaria 1 and G 716 gave the lowest values in the first and second seasons, respectively, but without significant superiority over those Etay L4, G 461 and Sakha 1. In this respect, Hanounik and Bisri, 1991 reported several rust resistant lines, where BPL, 1179, 261, 710, 8, 406, 417 and 484 have been found to be resistant in Syria, Egypt and Canada. The faba bean lines L 82009, L 82001, L 82011 and L 82010 have been rated as resistant to both rust and chocolate spot (ICARDA, 1987).

Table (4): Rust disease severity of some faba bean genotypes under field conditions.

Season	2003/2004				2004/2005			
Period / Genotypes	1st	2nd	3rd	$\bar{x}$	1st	2nd	3rd	$\bar{x}$
Etay L1	3.00	4.13	5.77	4.30	3.03	5.27	5.90	4.77
Etay L2	1.80	2.87	3.23	2.63	1.63	4.53	5.23	3.80
Etay L3	2.17	2.83	4.17	3.06	2.00	3.90	4.83	3.58
Etay L4	1.67	2.90	4.13	2.90	1.77	3.50	4.30	3.19
Nubaria 1	1.43	2.67	3.17	2.42	1.50	3.37	4.00	2.96
Giza 843	1.77	2.97	3.80	2.84	2.30	3.73	4.50	3.51
Giza 461	1.53	2.67	3.60	2.60	1.90	3.43	4.00	3.11
Giza 716	1.90	2.73	3.37	2.67	1.73	3.13	3.57	2.81
Sakha 1	1.67	2.80	3.43	2.63	1.77	3.17	3.67	2.87
Misr 1	2.17	4.43	6.43	4.34	2.73	4.33	5.40	4.16
Mean	**1.91**	**3.10**	**4.11**	**3.04**	**2.04**	**3.84**	**4.54**	**3.47**
	A	**B**	**AB**		**A**	**B**	**AB**	
L.S.D 0.05	0.27	0.49	0.84		0.25	0.45	0.78	

A: Period **B:** Genotype **AB:** Period x genotype

C.V %: 16.94

The effect of interaction between genotypes and record period was significant in both seasons. The lowest values were detected by Nubaria1 at the 1st record period in the both seasons, and the highest values were obtained by Misr1 and Etay L1 at the 3rd record period in the first and second seasons, respectively.

Results given in Table (5) show significant differences between some agronomic characters of the studied faba bean genotypes. It is clear that, in the first season Etay L1 had the least number of days to inflorescence followed by G 843 and Sakha1 with averages 48.67, 50.00 and 51.33 days, respectively and the same trend was cleared in the second season and the combined analysis. In case of the number of days to maturity, in the first, second seasons and in the combined data Etay L1 had the first grade where it had the least days followed by Etay L3, Giza 843 and Sakha 1. The best grade which had Etay L1 for these parameters may be due to its parent T.W where Bastawisy and Rahhal (1998) reported that T.W variety was the earliest genotype they tested which its maturity date was 140 days. With regard to plant height (cm), Nubaria 1 had the tallest plants followed by Etay L3 and Etay L4 with averages122.00, 120.17 and 118.67 cm in the combined data, respectively, but the differences between them were not significant. The same trend was obtained in the first and second seasons separately whereas the three genotypes gave the tallest plants. On the other hand, Nubaria 1, Etay L4, and Giza 716 produced the most number of branches/plant which were 3.57, 2.87 and 2.33, respectively in the first season. The same trend was cleared in the second season, but Etay L1 replaced Giza 716 in its order with an average 2.27. In the combined data, the highest number of branches/plant was recorded by Nubaria 1 followed by Etay L4 and then Etay L1 while the lowest values were detected by Giza 843 and Misr1 with averages 1.47 and 1.48, respectively.

Results presented in Table (6) show that there are significant differences between genotypes in first flower height (cm), first pod height (cm), number of pods/plant and number of seeds/plant. Etay L1, Giza 843 and Giza 716 had the lowest flower in both seasons. The same trend was obtained in the combined data. On the other hand, Etay L1 had the lowest first pod (cm) followed by Misr1 and Giza 716 in the two seasons. In the combined data Etay L1 had the first order followed by Misr 1 but without significant superiority between them. Etay L1, Giza 843, Etay L4 and Sakha 1 recorded the much estimates of pods number/plant in both seasons. The same order was recorded in the combined data while Nubaria 1 gave the lowest number of pods/plant. In case of number of seeds/pod, Nubaria1, Etay L1 and Etay L4 had the first three grades, respectively and data in the second season closed to the first one except in case of Giza 461 which replaced Etay L1. The combined data showed that Etay L4 and Nubaria 1 gave the highest number of seeds/pod but without significant superiority over Giza 461 while Sakha 1 gave the lowest one.

Generally, from Table (6) it is noticed that Etay L1)TW x Nubaria 1)showed the best estimates of the first flower height (cm), first pod height, number of pods/plant and detectable order in the number of seeds/pod. These results can be explained by an increasing homogeneity among its crosses by consecutive selection in every generation (Hamdi *et al.*, 2003).

Table (5): Means of number of days to inflorescence, number of days to maturity, plant height (cm) and number of branches/plant for some faba bean genotypes in the field experiment in two seasons and the combined of them.

Genotypes	Number of days to inflorescence			Number of days to maturity		
	2003/04	2004/05	Comb.	2003/04	2004/05	Comb.
Etay L1	48.67	48.33	48.50	146.7	144.3	145.50
Etay L2	55.33	54.00	54.67	153.5	151.7	152.33
Etay L3	55.00	54.00	54.50	151.7	150.0	150.83
Etay L4	57.67	56.00	56.83	153.0	152.0	152.50
Nubaria 1	73.33	74.00	73.67	162.7	160.7	161.67
Giza 843	50.00	48.33	49.17	152.3	151.7	152.00
Giza 461	57.33	54.00	55.67	158.0	155.7	156.83
Giza 716	57.67	53.33	55.50	156.0	153.7	154.83
Sakha 1	51.33	50.67	51.00	152.3	151.3	151.83
Misr 1	51.67	50.67	51.17	154.3	154.0	154.17
L.S.D 0.05	2.96	2.57	1.89	2.64	2.29	1.69
C.V %	3.10	2.76	2.94	1.00	0.88	0.94
	Plant height (cm)			Number of branches/plant		
Etay L1	112.7	117.3	115.00	2.13	2.27	2.20
Etay L2	108.7	108.7	108.67	2.23	1.37	1.80
Etay L3	121.7	118.7	120.17	1.97	1.27	1.62
Etay L4	120.7	116.7	118.67	2.87	2.67	2.77
Nubaria 1	120.0	124.0	122.00	3.57	2.70	3.13
Giza 843	110.7	124.0	117.33	1.37	1.57	1.47
Giza 461	117.7	111.3	114.50	2.27	2.47	1.87
Giza 716	100.0	103.0	101.50	2.33	1.60	1.97
Sakha 1	109.0	116.0	112.50	2.07	1.77	1.92
Misr 1	114.0	118.3	116.17	1.63	1.33	1.48
L.S.D 0.05	6.69	4.51	3.90	0.34	0.28	0.21
C.V %	3.44	2.27	2.90	8.80	8.99	8.93

From Table (7) it is clear that Nubaria 1 had the first grade either in 100 seed weight (g), seed yield/plant (g), seed yield/plot (kg) or seed yield/feddan (ardab) in both seasons as well as the combined of them. At the same time L1 Etay had the second grade either in the two seasons or the combined of them.

Etay L1 had the first grade in earliness of the number of days to inflorescence or maturity, height of the first flower or pod (cm), number of pods/plant and shedding %. Also, it had the second one in seed yield/plant (g), seed yield/plot (kg) and seed yield/feddan, but without significant differences than Nubaria1 for seed yield/plant, plot and feddan. These results may be due to the heavy seed of Nubaria1 where it is classified as large seed and Etay L1 produced from cross (T.W x Nubaria 1) had these traits from its parent. The highest seed yield of Etay L1 may be due to high number of pods/plant. Etay L1 was considered the best line for earliness and high potentiality of yield.

Generally, the C.V% of all traits under study was low, revealing that increasing homogeneity among plants in all genotypes under test especially new lines by consecutive selection in every generation.

Table (6): Means of first flower height, first pod height, number of pods/plant and number of seeds/pod for some faba bean genotypes in the field experiment in two seasons and the combined of them.

Genotypes	First flower height (cm)			First pod height (cm)		
	2003/04	2004/05	Comb.	2003/04	2004/05	Comb.
Etay L1	36.67	36.00	37.33	31.00	3o.33	31.67
Etay L2	46.83	46.67	47.00	40.17	39.00	41.33
Etay L3	48.33	48.33	48.33	41.00	39.67	42.33
Etay L4	50.33	50.00	50.67	36.00	35.67	36.33
Nubaria 1	57.83	56.33	59.33	50.67	50.33	51.00
Giza 843	46.33	44.33	48.33	31.50	31.33	31.67
Giza 461	45.83	45.67	46.00	38.33	38.33	38.33
Giza 716	42.83	41.67	44.00	32.83	32.67	33.00
Sakha 1	44.00	42.33	45.67	36.17	35.00	37.33
Misr 1	37.50	36.33	38.67	37.00	36.33	37.67
L.S.D 0.05	3.62	7.16	2.21	2.52	4.36	2.86
C.V %	6.77	9.33	2.77	5.74	6.90	4.38
	Pods number/plant			Seeds number/pod		
Etay L1	3.23	3.07	3.40	19.33	18.63	20.03
Etay L2	3.07	2.97	3.17	14.52	13.67	15.37
Etay L3	3.07	3.23	2.90	15.50	14.30	16.70
Etay L4	3.48	3.57	3.40	17.47	16.03	18.90
Nubaria 1	3.47	3.47	3.47	12.38	11.63	13.13
Giza 843	2.90	2.73	3.07	18.17	16.77	19.57
Giza 461	3.32	3.43	3.20	15.88	14.53	17.23
Giza 716	3.15	3.23	3.07	13.93	12.60	15.27
Sakha 1	2.75	2.70	2.80	17.20	15.80	18.60
Misr 1	3.05	3.27	2.83	16.38	15.03	17.73
L.S.D 0.05	0.23	0.33	0.34	1.11	1.50	1.74
C.V %	6.22	6.17	6.28	5.89	5.85	5.88

Table (7): Means of 100 seed weight, seed yield/plant, seed yield/plot, seed yield/feddan and shedding% for some faba bean genotypes in the field experiment in two seasons and the combined of them.

Genotypes	100 seed weight (g)			Seed yield/plant (g)			Seed yield/plot (kg)			Seed yield/feddan (ardab)			Shedding %		
	1st	2nd	Comb.	1st	2nd	Comb.	1st	2nd	Comb.	1st	2nd	Comb.	1st	2nd	Comb.
Etay L1	74.35	73.40	73.87	48.00	51.80	49.90	4.02	4.47	4.25	13.53	15.15	14.34	81.83	80.90	81.37
Etay L2	82.95	81.57	82.26	32.47	35.13	33.80	3.17	3.48	3.33	10.69	11.74	11.22	87.53	84.47	86.00
Etay L3	82.79	77.87	80.33	34.00	38.20	36.10	3.20	3.52	3.36	10.76	11.96	11.36	86.57	83.10	84.83
Etay L4	86.62	83.27	84.94	43.83	45.00	44.42	3.67	4.05	3.86	12.36	13.65	13.01	85.20	83.00	84.10
Nubaria 1	111.70	108.60	110.17	49.90	52.33	51.12	4.22	4.52	4.37	14.21	15.30	14.75	87.70	84.87	86.28
Giza 843	82.87	80.40	81.64	45.73	46.73	46.23	3.88	4.18	4.03	13.11	14.10	13.61	84.43	81.00	82.72
Giza 461	86.62	84.13	85.38	36.07	38.93	37.50	3.20	3.82	3.51	10.78	12.86	11.82	86.10	82.20	84.15
Giza 716	93.54	91.93	92.74	30.57	31.70	31.13	3.02	3.38	3.20	10.16	11.40	10.78	88.17	83.17	85.67
Sakha 1	82.08	80.20	81.14	41.17	41.70	41.43	3.33	3.70	3.52	11.23	13.33	12.28	84.10	80.77	82.43
Misr 1	72.51	68.67	70.59	38.17	40.87	39.52	3.25	3.87	3.56	10.92	13.03	11.97	85.80	81.87	83.83
L.S.D 0.05	1.98	2.21	1.67	2.67	2.20	1.67	0.27	0.36	0.22	0.92	0.79	0.59	1.89	3.02	0.60
C.V %	1.35	1.55	3.47	3.89	3.04	3.47	4.52	5.47	5.07	4.58	3.48	4.01	1.28	2.13	1.74

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تقييم بعض السلالات الجديده للفول البلدي محصوليا وتاثرها ببعض أمراض المجموع الخضري

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أجريت هذه الدراسه خلال موسمي ٢٠٠٣/٢٠٠٤، ٢٠٠٤/٢٠٠٥ في مزرعة محطة البحوث الزراعيه بإيتاي البارود لتقييم بعض السلالات الجديده للفول البلدي لمقاومة مرضي التبقع البني والصدأ بالإضافه إلي تقييم بعض الصفات المحصوليه لها مقارنة بالأصناف التجاريه مثل نوباريه ١، جيزه ٨٤٣، جيزه ٤٦١، جيزه ٧١٦، سخا ١، مصر ١.

أظهرت النتائج فروقا معنويه بين هذه التراكيب الوراثيه من حيث درجة مقاومة مرضي التبقع البني والصدأ بالإضافه إلي عدد القرون/نبات، عدد البذور/قرن، وزن ١٠٠ بذره (جم)، محصول البذور/نبات (جم)، محصول البذور/قطعه تجريبيه (كجم)، محصول البذور/فدان (أردب). وتشير النتائج إلي أن السلاله إيتاي ل ١ مبشره من حيث درجة مقاومتها لمرض التبقع البني وصفاتها المحصوليه لذلك فإنه يمكن التوصيه بإدخالها في برامج تحسين محصول الفول البلدي.