THE STUDY OF SOME GRAIN GENOTYPES (*VICIA FABA* L.) FROM THE WORLD AND LOCAL ASSORTMENT, IN THE CONDITIONS OF THE MOUNTAIN AREA FROM OBCINILE BUCOVINEI

Gheorghe SAGHIN[1], Dumitru BODEA[1]
E-mail: g.saghin@yahoo.com

Abstract

The researches were made in the period 2005-2007 at the Agricultural Research Development Station Suceava, the Agricultural Research Center Pojorata, located in the mountain area from Obcinile Bucovinei, on the first terrace of Moldova river, on an altitude of 700 m, on a lithic alluvial soil with pH (water) of 5.3, mobile Phosphorus of 65.6 ppm, mobile Potassium of 71.4 ppm, humus content of 3.8% and nitrogen coefficient of 4.79. In the paper are presented the results obtained regarding the behavior of 60 grain genotypes (*Vicia faba* L.) from the world and local collection under the aspect of precocity, of some morpho-productive elements, of the resistance to diseases and of the production capacity. The studies made refer to the plant's height, to the number of fertile siblings, to the height of the insertion of the first pod, the number of pods on the plant, the number of grains in the pod, the number of grains on the plant, the weight of the grains on the plant, the weight of 1000 grains (virosis, *Uromices fabae, Botrytis fabae, Ascochyta fabae*) and the seed production. The grain genotypes from the verified range, which succeeded to mark out by their great capacity of production, by high resistance to the disease attack or other morpho-physiological features, represent a valuable source of germplasm for the amendment works that can be used as genitors in the hybridization process for creating new grain genotypes.

Key words: genotype, morpho-productive features, genitor, germplasm, evaluation, conservation

In our country, in the culture technology of the grain, it is registered a very narrow biodiversity expressed by a reduced assortment of cultivated varieties represented by three local varieties, Cluj 84 (*Vicia faba* L., minor var.) for fodder purpose, Moldovita and Montana (*Vicia faba* L., major var.) for food and fodder purpose. Besides these, we also meet, more frequently, in the culture, some local populations, characterized by a large fluctuation of production and a reduced ecological stability (Saghin Gh., 1996).

The grain is a Mediterranean origin culture with an important role in the agricultural system of this country, which covers almost 25% from the total cultivated surface and from the total of the grain varieties and the average realized production is very close to the average on a world plan (Saxena, M.C., 1991). In all the grain cultivator countries there are now major preoccupations referring to the growth of the productive efficiency (Carrouee B., 1993), to the resistance regarding the pathogen agents (Tivoli B. 1993, Bond D.A, 1993) to the action of the physiological factors which limit or influence positively the plants' growth and grain production (Karamanos A.L. 1991). In this area were also made further studies regarding the evaluation, conservation and use of the grain germplasm (Perino P., Robertson L.D., 1991).

Starting from the necessity of knowing and using in the amendment process of the grain of a larger genetic background, at the Agricultural Research Development Suceava (CCA Pojorata), was organized in 1984 a research program regarding the grain culture, which started through the collection and study of the initial material. Thus, this material is composed from 178 foreign genotypes from different eco-geographical areas and 130 varieties and local populations, a material which presently is conserved at the Genetic Resources Bank from Suceava (table 1).

In the present paper, in the second part is presented the behavior of some grain genotypes from the world and local range (first part, Saghin Gh., 1996).

MATERIAL AND METHOD

The researches were made at the Agricultural Researches Center Pojorat, Suceava County in the period 2005-2007, the altitude of 700 m on a lythic alluvial soil, located on the first terrace of Moldova river, having the following characteristics: pH (water) 5.3, P (Al) 65.6 ppm, K

[1] Agricultural Research Station Suceava Development

(Al) 71.4 ppm, humus content of 3.8% and nitrogen coefficient of 4.9%. It was followed the behavior of 60 grain genotypes from the world and local collection from the point of view of some morpho productive characters, of the precocity, of the disease resistance and production capacity. The experience made after the method of the blocks randomized in three repetitions, the seeding was done every year in the optimal era for the area, by insuring a density of 200 000 plants for ha. The predecessor plant was the potato every year. The data processing was made through the variance analysis. The grading methods for disease resistance were made after the following classes: resistant-0-10%, average resistant -10-20%, sensible -20-50%, very sensible- over 50% attack. Referring to virosis, the appreciation was made as a whole, the purpose being to know the behavior of this type to virosis.

Under climatic aspect, the respective area is characterized by a multiannual average of the precipitations of 726.2 mm, from which 531.0 mm in the vegetation period (table 1). From the point of view of the precipitations, the year 2007 located above the multiannual average with 31.5 mm for the whole year and close to the normal but very insignificant during the whole year and significant values above the normal during the vegetation period with 83 mm respectively 106.9 mm. The average multiannual temperature in this area is 6.4°C for the whole year and of 12.7°C in the vegetation period. Under this aspect the years 2005 and 2006 were normal during the whole year and a little above the multiannual average in the vegetation period. The year 2007 located above the normal with 2.5°C during the whole year and with 3.4°C in the vegetation period.

Table 1

Climatic conditions from the research period (2005-2007)

Year	Months												
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Sum/ Average
rainfall (mm)													
2005	18,8	16,8	13,4	53,6	99,1	104,2	121,8	224,5	10,8	11,6	13,2	4,9	692,7
2006	5,5	10,1	14,7	29,7	105,3	218,6	92,7	166,7	24,9	30,8	0,2	0,3	699,5
2007	6,6	14,7	57,5	31,8	155,4	45,8	93,2	146,8	47,8	113,1	22,4	22,9	757,7
the average yearly	13,6	21,8	56,5	37,2	109,1	88,2	118,0	113,1	65,4	50,8	28,1	23,9	726,2
average monthly temperatures (° C)													
2005	0,5	-5,4	0,3	6,2	12,4	14,7	16,5	17,1	12,1	1,3	1,1	-0,9	6,3
2006	-6,8	-0,1	0,1	7,0	11,4	14,5	17,4	17,9	12,8	1,2	1,2	-0,6	6,4
2007	2,7	-0,6	4,9	8,2	14,3	17,9	19,5	18,7	18,5	7,8	0,5	1,0	8,9
the average yearly	-4,3	-2,7	0,9	6,5	11,3	15,0	17,0	15,4	12,0	7,0	1,0	0,5	6,4

RESULTS AND DISCUSSIONS

The grain collection, located at Pojorata, represents the germplasm from 5 continents and 34 countries, Europe 248 genotypes, Asia 17 genotypes, Africa 13 genotypes, America 5 genotypes, Australia 1 genotype and 24 genotypes with unknown origin (table 2).

Morpho-productive characteristics

The 60 genotypes taken into study present a great variability of some morphological characteristics like: the plant's height, the insertion height of the first pod and the number of fertile layers, and also of some productivity elements as the number of pods on the plant and the weight of 1000 grains (table 3). Therefore, the height of the plants varies, on average on the years of study, between 49.8 cm and 109.0 cm, according to the genotype, the variety and provenience. There have been distinguished from this point of view the Romanian grain varieties- Moldovita, Cluj 84 and Montana which exceeded the height of 100 cm and the smallest size of the plants were registered by those coming from Italy 1626, Aquadulce, Greece 4390, Argentina, Israel 4483 and Holland 36407 which didn't exceed 60 cm. Between the insertion height of the first pod, very important for the mechanized cropping, and the height of the plant didn't exist a positive correlation, this one varying as an average between 15.0 cm and 37.6 cm, distinguishing especially the proveniences: Mexico 47302, Timovo, Africa 4504, Turkey 4418, Greece 4379 and Omar. Referring to the average number of fertile layers at a plant, succeeded to distinguish the genotypes Turkey 4415, with 2.1 layers, Montana and Moldovita with 2.0 layers, Mexico 47301 with 1.9 layers, Serbia 4478 and Italy 103252 with 1.8 layers, Italy 103266 and Argentina 4464 with 1.7 fertile layers at a plant.

.

Table 2

The studied grain collection

Eco-geographical area	Country	Number of analyzed genotypes	The production's amplitude (kg/ha)
1	2	3	4
EUROPA			
South Eastern	România	130	2175 – 3760
Central	Polonia	3	1700 – 2483
	Ceho-Slovacia	6	1600 – 2150
	Ucraina	1	2600
	Ungaria	3	1775 – 2375
	Austria	3	1540 – 2623
	Germania	12	2200 – 3016
Eastern	Rusia	4	1675 – 3019
1	2	3	4
Southern	Italia	21	2025 – 3467
	Grecia	9	1925 – 3785
	Serbia	6	1800 – 3750
South Western	Spania	15	1925 – 3570
Western	Franţa	8	1080 – 3015
Northern	Danemarca	1	1571
North Western	Anglia	1	3000
	Olanda	7	1750 – 3680
	Belgia	4	1900 – 2280
South Eastern	Turcia	14	1750 -3475
ASIA			
Eastern	Japonia	1	2500
Southern	India	1	1100
Western	Cipru	4	1800 – 3535
South Western	Iran	1	1000
	Irak	3	1950 -2916
	Siria	2	2000 – 2700
	Iordania	1	1800
	Yemen	1	1993
	Israel	2	2000 – 2451
	Afganistan	1	1800
AFRICA			
Eastern	Etiopia	2	1450 – 2920
Northern	Tunisia	2	1860 – 2157
North Eastern	Egipt	3	2100 – 2615
North Western	Maroc	6	1270 – 3000
AMERICA			
Central	Mexic	4	1350 – 3390
Southern	Argentina	1	2153
AUSTRALIA			
	Australia	1	3243
Unknown origin		24	1400-3895
TOTAL		308	

Regarding the number of pods in the plant, the average values situated between 4.3 and 14.4. They were distinguished through a high number of pods on a plant- genotypes Irak 4480 with 14.4 pods, Moldovita with 13.2 pods, Africa 4504 with 12.1 pods, Cluj 84 with 11.9 pods, Montana with 11.8 pods, Boss with 11.2 pods and Australia 4494 with 10.0 pods on a plant. The number of grains in the pod varied sensibly at the genotypes taken into study, the average values being included between 1.9 and 3.3. They distinguished with high values of this productivity element, genotypes Minica, Spain 15533, Prerovky, Turkey 4430, Freya, Greece 4379, Crotone, Arrigliano, Holland 36407, Marschenfrud, Turkey 4425, Gobe and Kisvardai-29, the differences towards the value of the witness being very significant. The weight of the grains on the plant varied between 8.5 g and 28.3 g, this happened according to the number of the grains in the pod and to the weight of 1000 grains. It succeeded to distinguish the Romanian varieties Montana and Moldovita and also the genotypes Africa 4504, Australia 4494, Turkey 4418 with 24 g above on the plant. The climatic conditions of the experimenting years influenced a little less the weight of 1000 grains, this being a character widely connected by variety and genotype, the average values oscillating between 320 g and 1082.

Table 3

Morpho productive features

Genotype	Plant's height (cm)	Number of fertile layers	Insertion height of the first pod (cm)	Number of pods on the plant	Number of grains in the pod	Number of grains on the plant	Grain weight on the plant (g)	MMB
Cluj 84	105.3	1.0	23.0	11.9	2.4	28.5	14.2	524
Montana	98.1	2.0	24.6	11.8	2.2	25.9	24.8	960
Moldoviţa	109.0	2.0	25.2	13.2	2.0	26.4	28.3	1075
Omar	70.7	1.0	28.4	8.2	2.5	20.5	10.0	488
Kisvardai – 29	71.7	1.0	24.7	6.8	2.8	18.8	10.0	532
Timovo	62.2	1.2	33.4	10.1	2.5	25.0	9.5	380
Gobe	69.8	1.0	25.5	8.3	2.8	23.6	10.5	445
Exelle	64.2	1.0	21.1	9.7	2.6	25.6	9.5	371
Irak 4481	59.8	1.0	25.1	7.1	2.4	17.1	10.5	614
Egipt 27705	60.9	1.2	20.7	7.2	2.3	16.5	12.5	757
Czechnichi	81.0	1.2	22.3	7.9	2.6	20.8	12.0	576
Serbia 4478	82.4	1.8	22.2	9.2	2.6	23.9	12.5	523
Boss	71.8	1.2	17.6	11.2	2.6	29.0	14.0	483
Africa 4504	87.5	1.3	30.9	12.1	2.1	25.0	25.0	1000
Turcia 4418	75.7	2.0	30.5	13.6	2.3	31.1	24.5	788
Dire Dawa	75.8	1.0	25.7	10.6	2.7	29.0	14.5	500
Freya	69.7	1.0	26.9	9.0	2.9	26.5	8.5	320
Irak 4480	68.8	1.1	26.7	14.4	2.3	33.0	14.5	439
Turcia 4425	63.9	1.0	29.9	3.5	2.8	9.9	11.5	1161
Italia 4626	49.8	1.1	18.9	7.6	2.3	17.1	14.5	819
Aquadolce	50.6	1.0	15.2	5.5	2.6	14.6	11.0	753
Rusia 4510	75.5	1.2	20.8	9.7	2.4	23.7	20.0	843
Spania 4416	72.2	1.3	19.7	10.5	1.9	20.3	17.0	838
Grecia 4390	56.0	1.6	17.0	8.3	2.3	18.9	12.5	662
Egipt 27708	63.2	1.0	23.2	6.5	2.4	15.8	11.0	697
Turcia 4419	64.0	1.0	20.5	5.4	2.6	14.0	14.0	1000
Egipt 27522	68.8	1.0	23.9	7.7	2.2	17.0	14.0	824
Turcia 4430	64.1	1.1	21.5	5.4	2.9	15.7	13.0	828
Turcia 4415	52.8	2.1	17.5	7.0	2.2	15.4	17.0	1104
Spania 15533	76.6	1.1	24.5	7.5	3.2	23.7	20.5	865
Argentina 4464	54.1	1.7	21.5	4.8	2.3	11.2	11.0	983
Israel 4483	56.0	1.1	20.2	4.9	2.4	11.6	11.0	949
Marschenfruo	67.0	1.1	23.9	9.0	2.8	25.5	14.0	549
Kompacta	64.2	1.4	19.5	8.8	2.5	22.1	18.0	815
Turcia 4429	65.0	1.0	24.3	9.3	2.7	25.0	14.0	560
Olanda 36407	59.0	1.2	16.7	4.3	2.8	12.0	11.0	917
Germania 28461	57.7	1.2	15.0	5.6	2.5	13.8	14.5	1051
Turcia 4420	81.8	1.2	24.4	8.0	2.2	17.9	16.5	922
Australia 4494	70.8	1.2	28.6	10.0	2.4	24.5	26.5	1082
Arrigliano	79.9	1.1	25.4	9.3	2.8	26.3	17.0	647
Crotone	67.8	1.0	24.0	5.6	2.8	16.0	10.5	657
Climax	72.8	1.0	21.2	4.6	2.5	11.4	13.5	1185
Mexic 47302	75.3	1.1	37.6	6.4	1.8	11.3	11.0	974
Grecia 4379	86.7	1.0	30.8	7.3	2.9	21.2	10.5	496
Maroc 25026	68.5	1.0	23.0	6.4	2.7	17.2	15.0	872
Iarael 4482	76.3	1.2	21.0	6.9	2.5	17.5	13.0	743
Minica	64.4	1.0	20.9	4.0	3.3	13.1	10.0	764
Prerovsky	75.3	1.0	27.0	6.8	3.0	20.2	10.0	495
Italia 103252	66.1	1.8	29.4	6.6	2.6	16.9	19.0	1125
Italia 103266	65.8	1.7	30.8	8.3	2.0	16.9	19.5	1154
Spania 106157	76.4	1.1	25.8	9.7	2.3	22.7	22.0	970
Spania 106163	83.2	1.2	28.3	11.7	2.3	26.7	27.0	1012
Spania 109679	73.5	1.0	25.7	9.0	1.9	17.6	21.0	1194
Mexic 47300	62.2	1.3	22.9	7.0	2.1	14.7	16.0	1089
Turcia 4422	61.9	1.2	24.2	6.2	2.7	16.9	14.5	858
Optica	66.4	1.0	24.0	8.2	2.1	17.6	11.0	625
Mexic 47301	69.6	1.9	32.9	8.2	1.8	14.9	16.5	1108
Serbia 4474	68.8	1.4	20.3	7.6	2.8	21.6	21.0	973
Grecia 107576	76.5	1.6	32.7	10.0	1.9	19.3	21.0	1088
Spania 106159	69.8	1.2	36.2	7.4	2.3	17.3	15.0	867
LSD 5 %	5,9	0,2	3,5	1,7	0,2			
LSD 1 %	8,2	0,3	4,8	2,3	0,3			
LSD 0,1 %	11,6	0,4	5,4	3,6	0,4			

Precocity

The phonological observations made during the vegetation period, in the three years of experimenting, underlined the fact that the whole material taken into study was more precocious than the witness variety, Cluj 84 with 1-25 days and a number of 3 genotypes located at the level of the witness (table 4). The most precocious genotypes taken into study proved to be Irak 4481 with the vegetation period of 95 days, Turkey 4425, Egypt 27708, Prerovsky and Turkey 4422 with 98 days, Russia 4510, Turkey 4419 and Marschenfruo with 100 days, Exell, Spain 4416, Spain 106157 and Spain 106163 with 102 days, Dire Dawa, Turkey 4430 and Greece 107576 with 103 days. Referring to the flowering duration , most of the studied genotypes Timovo, Gobe, Exell, Czechichi, Kompakta, Turkey 4420, Optica, Minica, Mexico 47301 and Serbia 4474 which exceeded the flowering period registered at the witness with 1-4 days. Between the vegetation period and the flowering duration didn't register any correlation (table 4).

Table 4

Precocity and disease resistance

Genotype	Flowering duration		Vegetation period		Intensity of disease attack			
	days	difference towards mt.	days	diff. towards mt.	uromyces fabae	botrytis fabae	ascochita fabae	virosis
0	1	2	3	4	5	6	7	8
Cluj 84	41	Mt.	120	Mt.	R	R	R	R
Montana	35	-6	116	-4	R	R	R	MR
Moldoviţa	34	-7	114	-6	R	R	R	MR
Omar	38	-3	110	-10	R	R	R	R
Kisvardai – 29	31	-10	111	-9	R	R	R	R
Timovo	40	-1	109	-11	MR	MR	MR	R
Gobe	42	+1	112	-8	R	R	R	R
Exelle	42	+1	102	-18	R	R	R	R
Irak 4481	34	-7	95	-25	MR	MR	MR	MR
Egipt 27705	41	0	110	-10	S	S	MR	S
Czechnichi	40	-1	115	-5	MR	MR	R	MR
Serbia 4478	37	-4	108	-12	MR	MR	MR	MR
Boss	39	-2	110	-10	MR	MR	R	R
Africa 4504	38	-3	109	-11	MR	MR	MR	S
Turcia 4418	41	0	114	-6	MR	MR	R	MR
Dire Dawa	37	-4	103	-17	MR	MR	MR	MR
Freya	34	-7	110	-10	R	R	R	R
Irak 4480	38	-3	110	-10	MR	MR	MR	MR
Turcia 4425	29	-12	98	-22	S	MR	MR	S
Italia 4626	30	-11	99	-21	S	S	MR	S
Aquadolce	32	-9	99	-21	S	S	MR	MR
Rusia 4510	35	-6	100	-20	MR	MR	R	MR
Spania 4416	38	-3	102	-18	MR	MR	MR	MR
Grecia 4390	39	-2	101	-19	S	MR	MR	S
Egipt 27708	30	-11	98	-22	S	S	MR	MR
Turcia 4419	34	-7	100	-20	MR	MR	MR	R
Egipt 27522	32	-9	101	-19	S	S	MR	MR
Turcia 4430	34	-7	103	-17	MR	MR	MR	MR
Turcia 4415	36	-5	109	-11	MR	MR	R	S
Spania 15533	34	-7	107	-13	MR	MR	R	R
Argentina 4464	30	-11	97	-13	MR	MR	R	MR
Israel 4483	31	-10	106	-14	MR	MR	R	R
Marschenfruo	29	-12	100	-20	R	R	R	R
Kompakta	45	+4	119	-1	R	R	R	R
Turcia 4429	32	-9	110	-10	R	R	R	R
Olanda 36407	41	0	120	0	R	R	R	MR
Turcia 4420	44	+3	120	0	MR	MR	MR	MR
Germania 28461	38	-3	109	-11	MR	MR	R	MR
Australia 4494	38	-3	105	-5	S	S	MR	MR
Arrigliano	40	-1	112	-8	R	R	R	R
Crotone	37	-4	110	-10	MR	MR	R	R
Climax	38	-3	102	-8	MR	MR	R	MR

0	1	2	3	4	5	6	7	8
Mexic 47302	32	-9	100	-20	MR	MR	MR	MR
Gracia 4379	34	-7	110	-10	S	S	MR	R
Maroc 25026	35	-6	109	-11	S	MR	MR	S
Iarael 4482	40	-1	112	-8	MR	MR	R	S
Minica	40	-1	120	0	MR	R	R	MR
Prerovsky	31	-10	98	-22	MR	MR	R	R
Italia 103252	30	-11	102	-18	S	MR	MR	MR
Italia 103266	29	-12	99	-11	S	S	MR	S
Spania 106157	32	-9	102	-18	MR	MR	R	S
Spania 106163	34	-7	102	-18	MR	MR	R	MR
Spania 109679	34	-7	102	-18	MR	MR	R	S
Mexic 47300	30	-11	99	-21	MR	R	R	MR
Turcia 4422	31	-10	98	-22	S	S	MR	MR
Optica	42	+1	115	-5	MR	R	R	MR
Mexic 47301	40	-1	118	-2	R	R	R	R
Serbia 4474	40	-1	117	-3	R	R	R	R
Grecia 107576	33	-8	103	-17	S	MR	MR	MR
Spania 106159	32	-9	105	-15	MR	MR	R	MR

Disease resistance

The level of the grain genotypes production is conditioned, in a great measure, beside other features also by the resistance to the main diseases. The observations from the research years show that the virosis produced by Vicia virus varians Quantz (the real mosaic of the grain), Pisum virus 2/ Stubbs/Smith (the usual mosaic of the grain), Pisum virus 1/Osborn/Smith (the powerful mosaic of the nerves), Vicia virus chlorogenum/quantz et Volk (the leaves turnover), *Uromyces viciae fabae* (the grain's rust), *Botrytis fabae* (The gray rot) and *Ascochyta fabae* (burn blot disease) are the main and most destroying diseases of the grain.

Of smaller importance, on the second place or which are only present have also been found *Fusarium* sp. (Fusariosa) and *Sclerotinia* sp. (Sclerotic disease). The intensity of the attack of the above-mentioned diseases, in the three years of research, differed according to the climatic conditions and according to the genotype. Generally, it was discovered that the genotypes from the major variety presented a higher sensibility to the above-mentioned dieses, in comparison with the genotypes from the minor varieties and equina and even to the attack of some pests like Bruchus ruphimanus. The rust attack (*Uromyces viciae fabae*) was presented in all the years with an attack intensity different in all the vegetation stages, but more pregnant towards maturity, being the disease that manifested the most powerful in this ecological area. Regarding the gray rot and the burn blot disease, produced by the fungus *Botrytis fabae*, respectively *Ascochita fabae*, manifested with a smaller intensity towards the rust at all the studied genotypes, marking out after the formation of the grains. They proved to be resistant to all the diseases taken into study, the genotypes Cluj 84, Montana, Moldovita,Omar, Kisvardai-29, Gobe, Exell, Freya, Marschenfruo, Kompacta, Holland 36407, Arrigliano, Mexico 47301 and Serbia 4474. The other genotypes presented different particularities to the disease resistance (table 4).

The production capacity

In proportion to the climatic conditions and agrobiological features , the level of productions varied in pretty large limits, underlining the different potential of productivity of the genotypes taken into study. On an average on the three years of study, the productions varied a lot between genotypes, being situated between 1674 kg/ha and 3390 kg/ha (table 5).

Table 5

The seed production (2005-2007)

Genotype	Origin	Var.	Production (kg/ha)					Diff. towards the mt. (kg/ha)	Sign.
			2005	2006	2007	Average	%		
0	1	2	3	4	5	6	7	8	9
Cluj 84	RO	Min	2175	2700	2815	2563	100	Mt	
Montana	RO	Maj	2980	3315	3650	3315	129	752	xxx
Moldoviţa	RO	Maj	2860	3250	3760	3290	128	727	xxx
Omar	CZ	Min	1600	2010	2150	1920	75	-643	ooo
Kisvardai – 29	H	Min	1775	2300	2375	2150	84	-413	o
Timovo	RUS	Min	1675	1910	2014	1866	73	-697	ooo

0	1	2	3	4	5	6	7	8	9
Gobe	RUS	Min	1725	2108	2205	2013	78	-550	oo
Exelle	B	Min	1575	1906	2113	1865	73	-698	ooo
Irak 4481	IQ	Min	1625	2130	2185	1980	77	-583	oo
Egipt 27705	EG	Maj	1925	2505	2615	2348	92	-215	
Czechnichi	Nec.	Min	2400	2416	2723	2513	98	-50	
Serbia 4478	SCG	Maj	2725	2503	2700	2643	103	80	
Boss	D	Min	200	2810	2890	2633	103	70	
Africa 4504	ZA	Maj	2900	3150	3570	3207	125	644	xxx
Turcia 4418	TR	Maj	2925	3410	3511	3282	128	719	xxx
Dire Dawa	ET	Eq	1525	2920	2905	2450	96	-113	
Freya	D	Min	1325	1716	1980	1674	65	-889	ooo
Irak 4480	IQ	Min	1925	2822	2916	2554	100	-19	
Turcia 4425	TR	Maj	1975	2328	2415	2239	87	-324	
Italia 4626	I	Maj	1825	2930	2907	2554	100	-9	
Aquadolce	F	Maj	1450	2200	2317	1989	78	-574	oo
Rusia 4510	RUS	Maj	2600	3000	3019	2873	112	310	
Spania 4416	E	Maj	2250	3410	3416	3025	118	462	xx
Grecia 4390	GR	Maj	1925	2505	2690	2373	93	-190	
Egipt 27708	EG	Maj	1050	2210	2313	1857	72	-706	ooo
Turcia 4419	TR	Maj	2300	2830	2890	2673	104	110	
Egipt 27522	EG	Maj	2200	2800	2875	2362	92	-201	
Turcia 4430	TR	Maj	2350	2640	2770	2587	101	24	
Turcia 4415	TR	Maj	3350	3406	3415	3390	132	827	xxx
Spania 15533	E	Maj	2325	2905	3011	2747	107	184	
Argentina 4464	AR	Maj	1950	2215	2295	2153	84	-410	o
Israel 4483	IL	Min	2150	2220	2300	2223	87	-340	o
Marschenfruo	Nec.	Maj	2000	2817	2990	2602	101	39	
Kompacta	Nec.	Min	3000	3210	3351	3187	124	624	xx
Turcia 4429	TR	Maj	2500	2814	2997	2770	108	207	
Olanda 36407	NL	Maj	2250	2235	2450	2312	90	-250	
Turcia 4420	TR	Maj	3125	3300	3399	3274	128	711	xxx
Germania 28461	D	Maj	2025	2918	3016	2653	104	90	
Australia 4494	AU	Maj	3005	3310	3415	3243	126	680	xxx
Arrigliano	I	Min	2650	3414	3464	3177	124	614	xx
Crotone	I	Min	2025	2100	2505	2210	86	-353	o
Climax	NL	Maj	2575	2730	2900	2735	107	172	
Mexic 47302	MX	Maj	1350	2200	2290	1947	76	-616	oo
Grecia 4379	GR	Min	1925	2119	2316	2120	83	-443	o
Maroc 25026	MA	Maj	2650	3000	3000	2950	115	387	x
Iarael 4482	IL	Maj	2050	2617	2651	2439	95	-124	
Minica	F	Eq	1800	2000	2305	2035	79	-528	oo
Prerovsky	CZ	Min	1800	2108	2208	2039	79	-524	oo
Italia 103252	I	Maj	3050	3314	3450	3271	127	708	xxx
Italia 103266	I	Maj	2275	3000	3250	2842	111	279	
Spania 106157	E	Maj	3000	3306	3415	3240	126	677	xxx
Spania 106163	E	Maj	3015	3250	3560	3275	128	712	xxx
Spania 109679	E	Maj	2950	3300	3570	3273	128	710	xxx
Mexic 47300	MX	Maj	3000	3225	3475	3233	126	670	xxx
Turcia 4422	TR	Maj	2025	2916	3015	2652	103	89	
Optica	F	Maj	2450	2230	2657	2446	95	-117	
Mexic 47301	MX	Maj	2225	3345	3390	2987	116	424	x
Serbia 4474	SCG	Maj	2050	3513	3750	3104	121	541	xx
Grecia 107576	GR	Maj	2450	3505	3730	3228	126	665	xxx
Spania 106159	E	Maj	2550	3080	3145	2925	114	362	x

Cluj 84 variety, taken as a witness, realized as an average 2563 kg/ha with variations between the years until 640 kg/ha. The larger productions, in this ecological area, were generally realized, by some genotypes from the major variety, which on an average realized production differences in comparison with the witness which were distinct and very significant. It succeeded to remark in a special way, the genotypes: Turkey 445, Montana, Moldovita, Turkey 4418, Turkey 4420, Spain 106163, Spain 109679, Italy 103252, Australia 4494, Spain 106163, Mexico 47300, Greece 107576 and Africa 4504 with average productions situated between 3390 kg/ha and 3207 kg/ha, the gains realized towards the witness being very significantly situated between 827 kg/ha and 644

kg/ha. The smallest productions realized the genotypes Freza, Egypt 27708, Exell, Timovo, Omar, Mexico 47302, Irak 4481, Aquadolce, Gobe, Minica and Prerovsky, with average productions situated between 1674 kg/ha and 2035 kg/ha, the minuses of productions towards the witness being very and distinctively significant, situated between 889 kg/ha and 524 kg/ha.

CONCLUSIONS

The grain genotypes, from the verified assortment, which distinguished through the great capacity of production, by great resistance to the disease attack or other morpho physiological features, represent a valuable source of germplasm for the amendment works, which can be used as genitors in the hybridization process for creating new grain genotypes.

As valuable gene sources for precocity stood up Irak 4481, Turkey 4425, Egypt 27708, Prerovsky, Turkey 4422, Russia 4510, Turkey 4419, Mexico 47300, Exell, Spain 4416, Dire Dawa, Spaqnia 106163, Turkey 4430 and Greece 107576, with the vegetation period between 95 and 103 days.

Under the aspect of the disease resistance, the genotypes Cluj 84, Montana, Moldovita, Omar, Kisvardai-29, Gobe, Exell, Freya, Maschenfruo, Kompakta, Holland 3604, Arrigliano, Mexico 47301 and Serbia 4474, presented some interest and manifested a good resistance to most of the pathogen agents.

From the point of view of the production capacity highlighted especially the genotypes from major var. like Turkey 4415, Montana, Moldovita, Turkey 4418, Turkey 4420, Spain 10613, Spain 109679, Italy 103252, Australia 4494, Mexico 47300, Greece 107576 and Africa 4504 which realized on an average for the three years of study, productions between 3390 kg/ha and 3207 kg/ha.

BIBLIOGRAPHY

Bond, D.A., 1993 - *Moteur d'évolution de la féverole et Sélection*, Grain legumes, ISSUE No. 1, May, 15-16.

Carrouee, B., 1993 – *Production de pois et féveroles: nouvelle étape dans la CEE*, Grain legumes , ISSUE No. 1, May, 18-19.

Karamanos, A.J., 1991- *Facteur physiologiques qui limitent la croissance et le rendement de la féve. Options Méditerranéennes*, Sere A, Seminaires Méditerranéens, CIHEAM-IAMZ ; No. 10 Zaragoza (Spania), 79-90.

Perrino, P., Robertson, L.D., 1991- *Conservation, evaluation et utilisation de germoplasme de féve: problematique et perspectives. Options Méditerranéennes*, Sere A, Seminaires Méditerranéens, CIHEAM-IAMZ ; No. 10 Zaragoza (Spania), 21-31.

Saxena, M.C., 1991 – *Statut an scope for production of faba bean in the Mediterranean countries. Options Méditerranéennes,* Sere A, Seminaires Méditerranéens, CIHEAM-IAMZ ; No. 10, Zaragoza (Spania), 15-20.

Saghin, Gh., 1996 – *Comportarea unor genotipuri de bob (Vicia faba L.) în condiţiile zonei de munte din Obcinile Bucovinei*, Lucr. Ştiinţ.. Volum omagial SCA Suceava 1946-1996, 163-174.

Tivoli, B., 1993 - *Rôle du pathologiste dans un program de sélection,* Grain legumes, ISSUE No. 1, May, 13-14.