

# AGROBIOLOGICAL STUDY OF SOME CLIMBING GARDEN BEAN VARIETIES AND LOCAL POPULATIONS

## STUDIUL AGROBIOLOGIC AL UNOR CULTIVARE ȘI POPULAȚII LOCALE DE FASOLE URCĂTOARE

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**Abstract.** *The paper present information about the main morphological and physiological and productive characteristics of ten varieties and local population of climbing garden bean. The research was carried out at the Vegetable Research Station Bacau, during 2002-2004, period in the open field environmental conditions.*

*The studied biological material shows a large variability regarding shape, size and color of pods and grains; also a great variability has the number of pods/plant. The most productive variants (varieties) were Verba, Aurie de Bacau and Violeta.*

**Rezumat.** *Lucrarea prezintă informații despre principalele caracteristici morfologice, fiziologice și productive a zece cultivare și populații locale de fasole de grădină urcătoare. Cercetările au fost realizate la Stațiunea de Cercetare și Dezvoltare Legumicolă Bacău, în perioada 2002-2004, în condiții de câmp. Materialul biologic studiat prezintă o mare variabilitate privind forma, mărimea și culoarea păstăilor și semințelor; de asemenea o mare variabilitate a prezentat și numărul de păstăi/plantă. Cele mai productive variante (soiuri) au fost Verba, Aurie de Bacău și Violeta)*

In the North-East and Central area of Moldavia there are known over 150 of local populations of garden climbing beans. Among these a large part is being cultivated as garden beans (of its green pees). From among these there have been created, through specific improvement methods, 4 breeds that in fact represent the official breed for this culture in our country. This breed comprises the breeds (crops): Aurie de Bacău, Verba, Violeta de Iași și Dragomir.

The agro biological study has as goal to put at the disposal of the production and research specialists detailed info regarding the morphological, physiological and production characteristics of some breeds and populations of garden climbing beans, under some very well-defined culture and natural environment

In order to achieve the purpose we have proposed the following:

- describing the morphological characteristics;
- describing the fenological characteristics and the endurance to illnesses;
- evaluation of the production;

## MATERIAL AND METHOD

In order to achieve the objectives set in mind, in the period 2002 – 2004 at the Vegetable Research and Development Station Bacau there has been undergone a collection study using a number of 10 breeds and local populations (table 1).

The vegetables cultivators will have at their disposal precise info about the official breeds and local populations that are being cultivated in the area, allowing them to choose in awareness the most suitable breed for culture, according to the conditions and more precisely the demands of the market. The improvers and seed producers will have the possibility to choose in awareness the most suitable material as source of germen-plasma for the improvement works, respectively for creating new cultures. The seed producers will know based on our results, the distinctive characteristics of the cultures form the official list and of the local populations bearing interest to the local cultivators.

*Tabel 1.*

**The collection's experimental variants**

Variant		Short description
nr	specification	
1	Aurie de Bacău	rosy flower, yellowish long and flat pod, beige - brownish seed
2	Verba	white flower, greenish very long and flat pod, white seed;
3	Violetă de Iași	violet flower, violet long and a little flat pod, beige seed
4	Dragomir	white flower, greenish, long and a little flat pod, seed
5	L -1 BC (Bălană)	white flower, yellowish, long and flat pod, dark-brown seed
6	L -3 BC (Verde dungat)	rosy flower, greenish medium long and flat pod, beige seed;
7	L - 8 BC (Grasă)	rosy flower, greenish – mottled, medium long and flat pod, mottled-beige seed;
8	L - 20 BC (Cafea)	violet flower, yellowish long and flat pod, brownish seed;
9	L - 46 BC (Grasă galbenă)	white flower, yellowish, long and flat pod, brownish seed;
10	L - 57 BC (Cartier)	violet flower, yellowish, long and flat pod, yellow-brownish seed

The collection cultivation has been achieved through an own technology, established by SCDL Bacau. The culture took birth by cultivation directly in the field in nests placed on two rows with a 80 cm distance between them, on beds with the width raised to the top beam of 120 cm; each nest has included 4-5 seed (plants), the distance between the nests being of 40 cm. The medium density was of 3.123 nests/m<sup>2</sup>, respectively 12,5 plants/m<sup>2</sup>.

The experience was organized in a lineal, superposed gadget, each variant occupying a parcel of 1,6 m x 5 m = 8,0 m<sup>2</sup>, on a single raised bed, with two rows of nests, placed on the same espalier, comprising a number of 25 nests, respectively 100 plants.

## RESULTS AND DISCUSSIONS

### 1. Morphological Description

The study of the main morphological characteristics has high lightened that the sort that has been studied presents a rather high variability. At the same time there is a combination noticeable of the characters, thus each variant (species or local population) has its own identity.

The experimental results regarding the morphological description are shown in the table nr. 2

*Tabel 2.*

**The morphologic characterization of the studied assortment (dates from 2002-2004)**

nr	Variant specificare	Flower's color	Pod's color	Pod's shape	Presence of threads in the pod*	Seed's color	Seeds form
1	Aurie de Bacău	rosy	yellow	flat	a	purple-beige	Reniform
2	Verba	white	green	flat	a	white	Oval
3	Violetă de Iași	violet	violet	flat-round	a	light beige	oval-reniform
4	Dragomir	white	green	flat-round	a (Aa)	white	Oval
5	L -1 BC (Bălană)	white	yellow	flat-straight	a (Aa)	brown	Reniform
6	L -3 BC (Verde dungat)	rosy	green	flat	a	purple-beige	Oval
7	L - 8 BC (Grasă)	rosy	mottled-green	flat	a	mottled-beige	Oval
8	L - 20 BC (Cafea)	violet	yellow	flat	a	brownish	Oval
9	L - 46 BC (Grasă galbenă)	white	yellow	flat	Aa	brownish	Elliptic
10	L - 57 BC (Cartier)	violet	pinkish-yellow	flat	a	brownish	Reniform

(\*A = with threads; a = without threads; Aa = forms threads at the end of the technological maturity)

### 2. Fenologic description

The fenology of the assortment demonstrates a relatively reduced diversity of the assortment. This fact can be due to the fact that the entire assortment, both the breeds as well as the local populations have formed (through empirical selection) under similar conditions in the environment and the selection has been achieved mostly due to the production characteristics and less due to the fenologic ones.

Among the fenologic characters studied there has been a special attention granted to the plants' reaction towards the action of the pathologic agents. On the assortment the results prove a reaction manner generally resembling, but also with some obvious differences.

Tabel 3.

**The phenologic characterization and disease resistance of the studied assortment  
(mean dates, 2002-2004)**

Variant		Nr of days before			Nr of days until		Illnesses endurance	
nr	specification	blooming	first pods	end of vegetation	first flowers at the end of vegetation	first pods at the end of vegetation	mark	symbol*
1	Aurie de Bacău	38	50	129	90	81	6-7	MR
2	Verba	31	40	122	91	80	6	MR
3	Violetă de Iași	29	40	123	90	82	7-8	MR (R)
4	Dragomir	38	52	129	93	82	5-6	MR
5	L -1 BC (Bălană)	36	50	120	83	70	4	MR
6	L -3 BC (Verde dungat)	45	56	127	81	70	6	MR
7	L - 8 BC (Grasă)	44	55	130	86	73	3-4	MR
8	L - 20 BC (Cafea)	40	54	128	88	74	6	MR
9	L - 46 BC (Grasă galbenă)	43	53	129	84	72	4	MR
10	L - 57 BC (Cartier)	40	50	125	84	76	3	S

\* R = rezistent; MR = medium rezistent; S = sensible.

### 1. Productivity description

The crops productivity is a complex characteristic, determined by the density of the pods, the number of pods on the plant, the number of seeds in the pod, the mass of 1000 seeds (MMB), insertion of the first pod (the distance from ground to the first pods), evaluated productivity of pods and seeds.

The results regarding the main elements of productivity are presented in the table nr.4 and allow a classification of the studied assortment afterwards.

Tabel 4.

**The assortment description regarding the main productivity elements (mean dates 2002-2004)**

Variant		Nr of pods/ plant	Pod's dimension (cm)			Nr of seeds /pod	MM B	Insertio n of the first pods (cm)	Evaluated production	
nr	specificat		lenght	width	thickness				pod (t/ha)	seed (kg/ha)
1	Aurie de Bacău	73	20	1,9	0,6	5-8	520	18-22	36	2400
2	Verba	60	26	2,1	0,9	4-7	710	28-30	42	2800
3	Violetă de Iași	66	19	1,2	0,9	5-7	490	30-32	30	2200
4	Dragomir	107	12	1,4	0,7	3-5	430	25-27	30	1800
5	L -1 BC (Bălană)	65	17	2,0	0,7	5-6	420	12-16	34	2000
6	L -3 BC (Verde dungat)	67	17	1,6	0,7	5-7	230	17-20	8	1800
7	L - 8 BC (Grasă)	103	14	1,8	0,5	5-7	525	17-20	29	1800
8	L - 20 BC (Cafea)	68	12	2,1	0,8	4-5	440	19-22	30	2000
9	L - 46 BC (Grasă galbenă)	56	17	2,1	0,9	5-7	410	19-20	35	2400
10	L - 57 BC (Cartier)	59	18	2,0	0,7	6-8	430	16-18	28	2300

## CONCLUSIONS

In conclusion the studied assortment comprises species and productive local populations and with a good quality of the pods and at the same time, resistant or sufficiently resistant to the attack of the pathogen agents. In this sense there can be exemplified (in the order of productivity):

1. The Verba species is a highly productive species, with a big pod (both long and wide) with a green colour, without threads and medium resistant to illnesses;

2. The Soul Aurie de Bacău species is a highly productive species, with a big pod (long and wide), without threads, with a yellow colour and with a medium resistance to the main pathogen agents;

3. L-46 Bacău (Grasă galbenă) – population of high productivity, with a big pod (long and wide), with a yellow colour and red spots, without threads and with a medium to low resistance to the main pathogen agents;

4. Violeta de Iași – is a species of large to medium production, with a big pod (long and flatten cylindrical) without threads or vellum surface, with a violet colour, medium resistant to the pathogen factors;

## REFERENCES

1. **Ceașescu I. 1973** – *Producerea industrială a legumelor*. Editura Ceres, București
2. **Maier I., 1969** – *Cultura legumelor*. Editura Agro-Silvică, București
3. **Munteanu N., 1985** – *Câteva aspecte asupra unor populații locale de fasole de grădină urcătoare*. Cercetări agronomice în Moldova, vol. 4.
4. **Munteanu N., 1987** – “Aurie de Bacău” – un nou soi de fasole de grădină. Producția vegetală – Horticultura, nr. 1/1987, București
5. **Săulescu N.A., Săulescu N.N., 1967** – *Câmpul de experiență*. Editura Agro-Silvică, București
6. **Stan N., Munteanu N., 2001** – *Legumicultura*. Vol.II. Editura Ion Ionescu de la Brad, Iași.
7. **Stan N., Munteanu N., 2003** – *Legumicultura*. Vol.III. Editura Ion Ionescu de la Brad, Iași.