

THE BEHAVIOUR OF SOME VARIETIES OF BEANS GROWN IN THE CLIMATIC CIRCUMSTANCES OF BIHARIA REGION

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RESEARCH ARTICLE

Abstract

The research paper studied the behaviour of certain varieties of beans under the climatic circumstances specific to Biharia region.

The varieties of beans tested in Biharia in 2023 are characterized by a great biological and productive potential.

The experiment with the varieties of beans emphasizes their behaviour from the angle of the measurements obtained which are related to the production.

The productive capacity of the species is closely related to the appearing of the climatic elements which influences it. In spite of this, there are certain species which respond better or less better to those specific circumstances, being pointed out from the others through the production differences.

Choosing the best – adapted variety for the climatic conditions of specific geographical area proves to be mostly influential upon the economical efficiency of that variety, besides the other technological elements which should be regarded for.

Key – words : variety, beans, climatic circumstances, area, productivity
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INTRODUCTION

The bean seeds are used as basic food for people; statistics made by FAO show that more than 500 million people usually eat bean products. For a long time, bean has been called “poop people’s meat” because of its high content of quality proteins; rich in essential aminoacids (lizine, arginine, triptofan) and more accessible with the price compared to the proteins of animal origin. The energetic value of the bean seed is very high, of course; reaching about 335 calories given by 100 grams of dried seeds.

Food products obtained from, dried beans are very tasty indeed; we can’t underrate their dietetical characteristics, and that is the reason they should be part of the diet recommended for the treatment of certain diseases, among them being the liver diseases.

Bean seeds flour can be used mixed with the wheat flour, in a percentage of 5% -

10%, in order to obtain tasty and nutritious bread.

Green pods are very appreciated as vegetables, whereas Chinese and Japanese cuisine use young beans offshoot prepared as salad.

The beanstalks (proteinic substances 8,1% of s.n.; glucid – 3,1% of s.n.; cellulose – 3,6% of s.n.) and bean pods constitute valuable fodder, especially for sheep and cows. Bean pods are used in medical field, prepared as tea for the treatments of diabetes.

The bean is harvested in early summer (July - August) leaving the land treated with nitrogen, without seeds or plant remains, the tilling of the ground is made in good conditions, so it can be considered as a good forerunner.

MATERIAL AND METHOD

The biological resources which were experimented upon considered in 6 varieties of beans: Avans, Ardeleana, Star, Ami, Diva, Emiliana.

Technical data regarding the technical conditions in which the experiment took place:

- Type of soil: brown
- Forerunner plant: wheat
- Maintenance work: 2 weedings
- Supervision work: 2 sinoratox!2,0 treatment against beans weevil

- Fertilization was made using autumn before ploughing
- Sowing was performed by hand
- During vegetation period observation and measuring were carried
- Harvesting was done by hand and weighing were carried
- Explanation and analysis of results
- The method of setting the experiment was in the form of random blocks of 6 variants arranged in 3 repetitions
- The harvesting area of a plot was 20 square meters, and the plants were sowed at the distance of 50 cm between the rows
- Thickness was of about 50 germinative beans on a square meter for all the 6 varieties
- The distance between the repetition blocks was of 1 meter (paths) and for each margin of the block there was placed one protection part as large as a common variant
- The scheme of the experiment field and of the randomizing way of the variants for the 3 blocks.

RESULTS AND DISCUSSIONS

The bean is a cultures plant with higher requirements regarding the pedoclimatic conditions.

The year 2023 was a favourable one for all the cultured plants, including the bean, because of all climate conditions which were most favourable.

During the vegetation period, for the varieties of bean experiment, a certain series blossoming were made, regarding the disease,

and pest, plant density at harvesting (table no. 1).

According to the description in Table no.1, the starting point of plants blossoming was 20th of June for Star and Diva varieties, while Emiliana and Ardeleana varieties followed 2 days later. For the Ami variety, blossoming began on the 26th of June, and for Avans variety, on the 1st of July.

Table 1

Observations made during the vegetation period of the beans variety experiment, Biharia, 2023

Nr.	Variety	Blossoming		Maturation		Grade for the resistance against diseases and pest	Density at harvesting/m ²
		Starting day	Duration	Starting day	Duration		
1.	Avans	1.07	22	27.07	12	2	41
2.	Ardeleana	28.06	22	27.07	10	2	46
3.	Star	26.06	21	19.07	11	2	36
4.	Ami	29.06	18	18.07	12	2	50
5.	Diva	26.06	21	19.07	13	2	38
6.	Emiliana	28.06	20	19.07	10	2	37

Duration of blossoming was about 18 days (Ami) and 22 days (Avans and Ardeleana).

Maturation of the bean pods in the year 2023 conditions began on the 18th of July (Ami). Star, Diva and Emiliana varieties followed on the next day.

About a week later (27th of July) the other 2 varieties, Avans and Ardeleana followed.

Duration of maturation extended from 10 days (Ardeleana and Emiliana) to 13 days (Diva).

Density of the harvesting plants was about 37 – 38 plants/m² for Emiliana and Diva varieties and up to 50 plants/ m² for the Ami variety.

In the conditions of 2023 there were no signification signs of diseases or pest at the varieties of bean experimented in Biharia.

Alongside the observations about vegetables presented above, before and after harvesting, measurements. (table no.2)

Table 2

**Biometrical measurements at the variety
of beans experimented, Biharia, 2023**

Nr.	Variety	Height (cm)		Nr. of pods/plant	Nr. of bean seeds/pod	Weight bean seeds/plant	MMB (g)	MHL (kg)
		Total	Insertion					
1.	Avans	64,4	10,0	11,0	44,2	9,7	250	78,8
2.	Ardeleana	58,3	9,0	9,9	49,2	10,9	280	77,2
3.	Star	55,8	9,5	10,2	36,5	12,7	350	72,0
4.	Ami	50,2	11,0	8,8	35,4	7,9	260	78,2
5.	Diva	58,1	11,4	10,8	43,3	11,4	290	74,0
6.	Emiliana	64,9	10,8	11,2	45,0	12,2	300	77,2

The total height of the plants is an average of 50,2 cm at the Ami variety, 55,8 cm at Star variety, 58 cm at Diva and Ardeleana varieties and about 65 cm at Emiliana and Avans varieties.

The insertion height of the bottom pods stretches between 9 cm (Ardeleana) and 11,4 cm at Diva.

The average number of pods per plant was 8,8 for Ami, 9,9 for Ardeleana and not more than 11,2 for Emiliana. In these conditions, the average number of bean seeds per plant was 35,5 for Ami, 36,5 for Star and maximum of 49,2 for Ardeleana.

The average weight of the bean seeds on a plant was of 7,9 g at Ami, 9,7 at Avans, 10,9 at Ardeleana and up to 12,7 g at Star variety.

The highest MMB was 250 g at Avans variety, followed by 269 g at Ami. The best

amount was of 300 g, and 350 g for the Emiliana and Star varieties.

The productions obtained during the experiment on beans in 2023 are good enough for the Western part of the country, almost of about 16,0 q/h in some cases (16,4 q/ hectare at diva variety in repetition III, the table).

The most productive variety is Ami, but the difference, compared to Diva and Emiliana is very little.

Compared to Avans – witness-variety, the “variation analysis” established the significance degree for the difference of the table.

Compared to Avans witness – variety, with an average production of 11,7 q/hectare. The Ardeleana and Star varieties showed differences of -0,1 and +0,4 q/hectare, proving insignificant in both cases.

Table .3

**Synthesis of production results obtained at
the bean experiment Biharia, 2023**

Nr.	Variety	Productions from repetitions			Average production q/ha	Relative production %	Difference q/hectare	Significance of differences
		I	II	III				
1.	Avans	8,3	11,4	15,4	11,7	100	-	-
2.	Ardeleana	8,9	12,0	13,9	11,6	99	- 0,1	-
3.	Star	10,9	12,8	12,6	12,1	103	+ 0,4	-
4.	Ami	15,4	14,6	15,0	15,0	128	+3,3	*
5.	Diva	13,2	14,2	16,4	14,6	125	+ 2,9	*
6.	Emiliana	13,7	14,5	16,2	14,8	126	+3,1	*

DL 5% = 2,47 q/ha

DL 1% = 3,51q/ha

DL 0,1% = 5,09 q/ha

CONCLUSIONS

The experiment regarding the behaviour of beans varieties in Biharia, took place in favourable climate conditions

These conditions caused a different response of the varieties from the point of view of observation and measurements which took place, and also of the productions obtained

Analyses of the data obtained in 2023 show a good behaviour of all the varieties, but Ami, Diva and Emiliana varieties were

distinguished from the rest, obtaining significant differences of production of +3,3 q/hectare, compared to Avans, the witness – variety, with the production of 11,7 q/hectare

In order to cultivate beans in Biharia region, following the experiment presented in this work, there can be recommended all 6 varieties of beans, but the most productive are: Ami, Emiliana and Diva.

REFERENCES

- Bîlteanu Gh, 1998, Fitotehnie, Editura Ceres, București;
- Borcean I., Borcean A., 2004, Cultura și protecția integrată a cerealelor și plantelor tehnice, Editura de Vest, Timișoara;
- Borcean I., Borcean A., 2003, Cultura și protecția plantelor leguminoase cultivate pentru boabe, Editura de Vest, Timișoara;
- Borcean I. și colab., 1997, Tehnologia plantelor de câmp, Editura Universității de Științe Agricole și Medicină Veterinară a Banatului Timișoara;
- Borcean I., Borcean A., 2004, Cultura și protecția integrată a cerealelor și plantelor tehnice, Editura de Vest, Timișoara;
- Bogdan Ileana, Guș P., Rusu T., 2003, Agrotehnica diferențiată, Editura Risoprint, Cluj Napoca
- Crucița Sîrca, 2003, Comportarea unor specii de leguminoase în urma tratării semințelor cu tulpini selecționate de Rizobium, pe solurile argiloiluviale, Consfătuirea de Agrofitehnie, Livada, 18 – 20 iunie;
- David Gh, 2003, Tehnologia plantelor de câmp, Editura Eurobit, Timișoara;
- Domuța C., Sabău N.C., 2001, Agrotehnică, Editura Universității din Oradea;
- Drăghici Reta, 2002, Comportarea unor genuri de fasoliță în condițiile ecopedologice ale solurilor nisipoase din sudul Olteniei, Lucrări științifice SCCCNP
- Dăbuleni, vol. XIII;
- Mihăilescu Ghența, 1995, Influența îngrășămintelor azotate asupra producției leguminoaselor pentru boabe (soia, mazăre, fasole) pe trei tipuri de sol. Teză de doctorat, Institutul Agronomic București;
- Muntean L.S. și colab., 2001, Fitotehnie, Editura I.I. de la Brad, Iași;
- Olaru C., Fasolea, Editura Scrisul Românesc, Craiova, 1982;
- Prodan Ioana, Contribuții la evidențierea rolului unor factori fitotehnici în creșterea eficacității biopreparatelor fertilizante la fasole. Teză de doctorat, Universitatea de Științe Agronomice și Medicină Veterinară București, 1997;
- Pârșan P., 2003, Tehnologia plantelor de câmp, Editura Agroprint;