

INFLUENCE OF MINERAL FERTILIZATION ON DWARF BEAN SEED PRODUCTION, IN THE IASI AREA CONDITIONS

INFLUENȚA FERTILIZĂRII MINERALE ASUPRA PRODUCȚIEI DE SEMINȚE LA FASOLE DE GRĂDINĂ, ÎN CONDIȚIILE ZONEI IAȘI

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Abstract. *In this paper is presented the influence of the interaction between fertilization regime and seven new dwarf beans cultivars on seed production. Research has been organized an experimental plot at Didactic and Experimental Station "V. Adamachi" in Iasi, in order to promote new cultivars from official catalog of varieties of the EU in NE area from Romania. In the 2011-2012 period that were carried out observations and biometric measurements pods and seed production per hectare etc. The best results for seed production were obtain from cultivars Scylla (2469 kg / ha) and Minidor (2202 kg / ha), the results are considered distinct and very significant compared with the experience average. Regarding characterization in terms assortment of seed color, we can say that it is white all cultivars except Saxa variety and MMB range from 200 g (Bergold) to 390 g (Saxa).*

Keywords: *cultivar, fertilization scheme, dwarf french bean, seed production*

Rezumat. *În lucrarea de față este prezentată influența interacțiunii dintre regimul de fertilizare și șapte cultivaruri noi de fasole de grădină asupra producției de semințe la fasolea de grădină pitică. Cercetările au fost organizate la Stațiunea Didactică Experimentală "V. Adamachi" din județul Iași, cu scopul de a promova noi cultivaruri din Catalogul oficial al soiurilor de la UE, în condițiile de cultură din NE țării. În perioada 2011-2012, s-au efectuat observații și determinări biometrice pentru păstăi și producția de semințe la hectar etc. Cele mai bune rezultate pentru producția de semințe au fost obținute de cultivarele Scylla (2469 kg/ha) și Minidor (2202 kg/ha), rezultatele obținute fiind considerate distinct și foarte semnificative comparativ cu media experienței. În ceea ce privește caracterizarea sortimentului din punct de vedere al culorii seminței, putem afirma că acesta este albă la toate cultivarele cu excepția soiului Saxa, iar MMB variază de la 200 g (Bergold) la 390 g (Saxa).*

Cuvinte cheie: *cultivar, regim de fertilizare, fasole de grădină, producție de semințe*

INTRODUCTION

Beans along with other legumes, is one of the essential foods that

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contribute to the diversification of the assortment of vegetables, which improves protein balance in the human diet is much appreciated and quite high due to the content in the other nutrients, sugars (carbohydrates 5-7 g/100g), vitamins (vit. C - 16 mg/100g, vit. PP - 0,5 mg/100g, vit. B1 - 0,6 mg/100g, vit. B2 - 0,5 mg/100g s.a) (Chaux, 1996, Ciofu, 2004)

Enriching the germoplasm fund of this crop of new sources of resistance to pathogens, high in nutrients, clustered layout of clusters in the upper third of the plants, higher yield potential to promote new varieties of garden beans, represent an objective basic research that are addressed by this paper (Fouillox, 1992, Patron, 1992, Munteanu, 2003).

In terms of climate change in recent years and the implementation of sustainable practices, variety is perhaps the most important biological factor of production, which is directly related to its adaptation to new environmental conditions. At the same time variety is an element of expression of crop biodiversity in terms of a permanent change assortment growing (Olaru, 1982, Munteanu, 2003).

The variety, by definition, is an experimental biological population including individuals characterized by distinctibility, uniformity and stability, and agronomic value. At the same time, characteristics seed is the carrier characters or characteristics of each variety. All biological characteristics give it agronomic value, defined briefly as a complex of characteristics that assures usefulness determined by productivity and crop quality, the suitability for certain environmental conditions, the ability to respond positively to anthropogenic inputs provided of a technology for cultivation (Poasca, 1986, Fouilloux, 1992, Ruști, 2007).

The importance of seed as the carrier material factor cultivar characteristics, leads to approach or knowledge of measures and means of cultivar quality is maintained or kept as standard, according to "official description" made by the owner cultivation or its author (Boroscic, 2000, Munteanu, 2003).

The conservation of cultivars is of major importance in producing seed, knowing that environmental factors (the external factors), and some endogenous factors can cause degradation or degeneration cultivars. Romanian varieties registered in the official catalog to the European Commission (DG SANCO) for inclusion in the EU Common Catalogues, which can be marketed throughout the EU. These varieties are submitted for inclusion in the List of Varieties Eligible for Seed Certification, published by the Organization for Economic Cooperation and Development (OECD) (Dumitrescu, 1998, Catalogul, 2012).

MATERIAL AND METHOD

The research was carried out at D.E.S. "V. Adamachi "from Iasi place, during 2011-2012. It was studying an assortment of seven cultivars of dwarf French beans: a₁-Jutta, a₂-Scylla, a₃-Maxidor, a₄-Saxa, a₅-Minidor, a₆-Slenderette și a₇ -Bergold.

Regarding fertilization regime applied in the two experimental years, it is as graduation:

- d₁ – base fertilization with 50 kg s.a. P₂O₅ S and 50 kg s.a. K₂O (autumn) and 40 kg s.a./ha N from ammonium nitrate (spring on land preparation);
- d₂ – base fertilization with 75 kg s.a. P₂O₅ and 75 kg s.a. K₂O (autumn) and 40 kg s.a./ha N from ammonium nitrate (spring on land preparation) ;
- d₃ – base fertilization before seeding with 300 kg/ha complex III fertilizer (39 N ; 78 P₂O₅ ; 38 K₂O) ;

The experiment was set in a experimental stationary after a tomato crop of for industrialization. Soil preparation works were carried out in accordance with appropriate technology of conventional crops.

Sowing was done around the time of 01.05, using his own seed produced in 2010 and 2011 from previous experiences. Setting up crop has been achieved with SUP 15 average distance of 37.5 cm between rows and 5-6 cm between plants in the row, at a depth of 3 cm, resulting in a density of 440000-530000. The quantity of seed used to establish a crop of MMB varied between 89-170 kg / ha.

Seeded area of each experimental plot was 40 m², so that the minimum size for harvesting is 30 m² (Săulescu, 1967).

During the years 2011 and 2012 were carried out observations and biometric measurements that ensure the achievement of a general characterization of the assortment. The seed production was analyzed at the end of the growing season (on July 30). Production data were processed by specific methods (Săulescu și Săulescu, 1967, Jităreanu, 1994).

RESULTS AND DISCUSSIONS

In terms of the influence of fertilization and cultivars on seed production during 2011-2012, can be seen from Table 1, that production experiment varied between very wide limits, from 1356 kg / ha (Bergold x d₃) in 2687 kg / ha (Scylla x d₂) obtained from the average differences being statistically experience, 95%, 99% and 99.9%.

Table 1

The interaction influence of cultivar x fertilization dose on dwarf French bean seed production (kg/ha)

Specification Cultivar	Fertilization scheme			Total yield (kg)	Average yield (kg/ha)
	d ₁	d ₂	d ₃		
Jutta	1950	2240	1790	5980	1993
Scylla	2480	2687	2240	7407	2469
Maxidor	1870	2289	1543	5702	1901
Saxa	1884	1950	1796	5630	1877
Minidor	2192	2376	2037	6605	2202
Slenderette	1970	2285	1793	6048	2016
Bergold	1654	1785	1356	4795	1598

The seed production of the dwarf French bean obtained at the 30.07 in the conventional system, varied from 1598 kg / ha for Bergold to 2469 kg / ha for Scylla variety; same results have been obtained by Borosic, 2000. The production

difference than the average experience in this case (461 kg / ha) is regarded as positive, very significant. Also, distinctive significant difference (Table 2) was also obtained and the Minidor variety (194 kg / ha). Bergold variety achieved the lowest seed production (1598 kg / ha), the difference from the average experience (-410 kg / ha) was negative very significantly. Negative differences than the average experience have obtained on Saxa (-131 kg / ha) and Maxidor (-131 kg / ha) cultivars.

Jutta and Slenderette cultivars have been close yields to the average experience and production increases obtained are considered insignificant.

Table 2

The seed production of dwarf French bean and the significance of differences compared to the control

No.	Variant	Average yield (Kg/ha)	% than control	Diference than control (kg/ha)	Significanc e of differences
1	Jutta	1993	99,25	-15	-
2	Scylla	2469	122,96	461	***
3	Maxidor	1901	94,67	-107	-
4	Saxa	1877	93,48	-131	o
5	Minidor	2202	109,66	194	**
6	Slenderette	2016	100,40	8	-
7	Bergold	1598	79,58	-410	ooo
8	Control (experience average) X	2008	100,00	0	-

LSD 5% = 110 kg/ha;

LSD 1% = 154 kg/ha;

LSD 0,1% = 217 kg/ha.

Table 3

The influence of fertilization regime on seed production of dwarf French bean and significance of differences than control

Variant	Kg/ha	% than control	Difference than control	Significance of differences	LSD
d ₁	2000	99,60	-8	-	LSD 5% = 110 kg/ha LSD 1% = 154 kg/ha LSD 0,1% = 217 kg/ha
d ₂	2230	111,06	222	***	
d ₃	1794	89,54	-214	oo	
Control (average of experience) X	2008	100,00	0	-	

Regarding the influence of fertilization on seed production in dwarf French bean (Table 3), we can say that it ranged from 1794 kg / ha in d3 fertilization scheme to 2230 kg / ha in d2 fertilization version, similar with results obtained by Alvino, 1988. Production difference obtained between this variant and control is statistically assured a percentage of 99.9%.

CONCLUSIONS

1. The studied assortment behaves in according to precocity of extra-early cultivars (Bergold) to early (Maxidor, Saxa) and the semi (Jutta, Scylla, Minidor and Slenderette), which causes enlargement of the growing dwarf French bean.

2. The seeds production determined by the influence of fertilization system and varieties varied between very wide limits, from 1356 kg / ha (Bergold x d3) at 2687 kg / ha (Scylla x d2).

3. Regards the influence of the fertilizer on seed yield, it can be said that the best results have been provide when was applied the basic fertilization 75 kg of P₂O₅ and 75 kg K₂O (autumn) and 40 kg / ha of N from ammonium nitrate (applied in the spring to ground prepare), which is 2230 kg / ha.

4. The seed production in the case of use of different cultivars of 1598 kg / ha for Bergold to 2469 kg / ha for Scylla variety. statistically Yields than average experience cultivars have been made Scylla and Minidor.

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