

The content in fat and proteins of different soybean types

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Abstract

The new cultivar Onix are characterized by a high yielding potential for its maturity group and a good resistance to downy –mildew. The high insertion heighz of basal pods an increased adaptability to mechanical harvesting. This cultivar is recommended for this area due to its very good qualitative features such as average protein and oil content and protein and oil yield per hectare.

Key words: cultivar, soybean, average protein, oil content.

INTRODUCTION

Among the leguminous plants for beans, soybean stands out for its high content of fat, which represents over 60% from the seeds weight, carbohydrates, mineral salts, vitamins and enzyme (BÎLTEANU and collaborators., 1991).

The specific protein to soybean is the glycine, characterised by a big solubility in water (61 -92 %) and a high degree of digestibility, and also a high content of essential amino acids, which determine a nutritive value close to that of the proteins of animal origin (CRĂCIUN, 1983).

The interest for the production and commerce of soybean was determined by the content in oil rich in unsaturated fat acids (75-85 %). Lately soybean became interesting to produce the protein food, as textured protein, of derivations from soymilk (MUREȘANU and collaborators, 2000, 2001).

The basic objective of any amelioration process of soybean is represented by the quantity and that why a special importance it is given to it.

MATERIAL AND METHODS

The soybean types discussed upon in this study were: Onix, Diamant, Perla, Agat, Safir and Atlas.

The most produced types of soybean are characterised by the low insertion of the basic pods, which has as a result an important loss of the crops (ARDELEAN, 1976, 1979).

The Onix type is an early type with a very tall size, similar to the Agat type. The average size of insertion of the basic pods being of 19 cm, with

variation limits between 16 and 23 cm. This high of the pods insure the performing of the mechanised harvesting with a combine, without any losses. The Agat type is known as the type with insertion height of the first pads; the highest (21 cm), net superior to the average height of insertion of the Safir (13 cm), Perla (11 cm) and Diamant (9 cm) types.

The appreciation of the production stability was carried on through the variability coefficients calculation (CEAPOIU, 1968). The determination of the protein and fats content was accomplished with the help of the analyser Infrapid 61, the method relying on the diffused reflexion of the electromagnetic radiation from the near infrared domain (N.I.R.)

RESULTS AND DISCUSSION

The tests carried on in the comparative crops have pointed out the very high average production of the Onix type of 3080 kg/ha, superior with 27 % to the Diamant type, and also superior with 7 % than the Agat type and with 6% than Safir type (DENCESCU, 1983). The production and the production stability for various soybean types are presented in the table 1.

Tabel 1

Yield and its stability at different soybean cultivars

Cultivar	Yield			s %
	Average Kg/ha	Variation limits Kg/ha	Relative %	
Diamant	2430	2260-2570	100	4,99
Atlas	2530	1940-2930	104	16,48
Onix	3080	2730-3420	127	10,49
Perla	2780	2630-3070	114	6,88
Agat	2010	2590-3070	120	6,46
Safir	2540	2650-3270	121	8,95

The Onix type has distinguished also with its average content of proteins of 41,1%, with variations limits between 39,9 and 42 %. The very low variation coefficient value in the case of the proteins content, represent a proof of a very good stability. The Onix type has the first place among the studied types also for the fat content 21,0% with variation limits 20,0% - 22,2 %. In table 2 are presented the protein and fat content of the studied types.

Regarding the average protein production, the first place is taken also by the Onix type, with 1061 kg/ha. The fat average production of Onix, type is net superior to the other analysed soybean types.

The superiority of the Onix type is maintained regarding the utile production of 1615 kg/ha and of utile energy of 9,6 Gcal/ha. The protein and

fat production, the utile production and the utile energy for a surface unit are presented in table 3.

Tabel 2

Protein and oil content at different soybean cultivars

Cultivar	Protein content %			Oil content %		
	Average	variation limits	s%	Average	variation limits	s%
Onix	41,1	39,9 - 42,0	2,1	21,0	20,0 - 22,2	3,9
Diamant	38,5	36,8 - 40,0	3,0	20,2	19,5 - 20,7	2,4
Perla	39,9	38,9 - 40,8	2,1	20,6	20,0 - 21,3	2,3
Agat	39,4	37,5 - 40,9	3,5	19,7	18,7 - 20,4	3,7
Safir	39,3	36,8 - 41,0	5,4	20,3	19,2 - 21,8	4,8
Atlas	38,9	36,9 - 40,7	3,4	20,6	20,0 - 20,8	2,3

Tabel 3

Protein and oil yield, useful yield and energy per surface at different soybean cultivars

Cultivar	Protein yield		Oil yield		Useful yield		Useful energy	
	Average Kg/ha	s%	Average Kg/ha	s%	Average Kg/ha	s%	Average Kg/ha	s%
Onix	1061	10,2	554	7,5	1615	9,2	9,6	8,6
Diamant	805	7,9	422	3,7	1228	6,3	7,3	5,5
Perla	954	8,1	492	5,6	1446	7,2	8,6	6,7
Agat	985	8,7	493	6,1	1478	7,5	8,7	6,5
Safir	992	7,1	515	9,4	1507	7,0	9,0	7,5
Atlas	969	8,3	499	8,1	1468	8,2	8,7	8,2

Analysing the main characteristics and proprieties of the analysed soybean types, the superiority of the Onix type is resulting the obvious superiority of the Onix type under the aspect of some basic characteristics and properties, as if: the production capacity, the average height of the plants, the first basic pads insertion height, the protein production on hectare, the fat production on hectare.

CONCLUSIONS

Comparing the main characteristics and properties of the Onix type with the other analysed soybean types, is resulting that this type is eliminating all the insufficiencies of the previously cultivated types.

Being an early type, it is possible to be harvested in the first half of September, representing a very good precursor for the autumn cereals. The high basic pads insertion height associated with a very good resistance against the fall and shakes give to this type a good adaptability to the mechanised harvest with minimum loses.

The high protein and fat content associated to the high production potential insure superior productivity regarding the protein and fat production and the utile production for a surface unit.

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