THE STUDY OF AUTUMN OAT LINES CREATED AND TESTED UNDER THE CONDITIONS OF AGRICULTURAL RESEARH AND DEVELOPMENT STATION LOVRIN

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Abstract. *The overall objective of this work is to create oat varieties of high productivity and superior quality. To this experience we take in study 15 oat lines, which have been tested against the control variety, Sorin, the only oat of autumn zoned. The 15 oat lines have been exclusive created by Agricultural Research and Development Station Lovrin. According to the Duncan test, there are significant differences between genotypes studied in comparative competition cultures. Of the lines studied was remarked the 2503 line, which produced a 7100 kg/ha production, exceeding the control variety by 20%, being very statistically significant.*

Keywords: *autumn oat, quality, production*.

INTRODUCTION

The oat (Avena Sativa) is one of the most populare crop plants known since antiquity, being innitially cultivated for the green mass or hay and subsequently for its grains (Sandu,1993). Into our contry tha oat is being cultivated on a surface roughly approximated to 180000 (2014, 2015, FAO STAT). Its importance into the world agriculture is determined of its valuable nutritious caracteristics. Therefore, the oat grains are irreplacable in the horses food; nor can it conceive the growth of this species without an oat substance. It is used in the feeding of other animal species such as breeding bulls, dairy cows, rams, birds etc. (ANDERSON SI BORJESDOTTER, 2011; MURARIU SI PLACINTA, 2017). In the rationale of these categories of animals, the replacement of maize with oats brings economic advantages, besides greatly raising the quality of concentrated fodder, can be cultivated on poorly fertile land, and maintenance spending on the crop is much lower (NUNES, 1989; MADOSA 1998). It is also very important in human nutrition as flakes, flour, semolina, coffee.What need to be underlined is that the nutritional value and the digestibility of the oat beans are high reason why they are well recommended especially for sick people, covalescence or children meals . Despite its high nutritional value , only 10% of the produced oat is used for human cosumption (ANDERSON SI BORJESDOTTE, 2011; MURARIU SI PLACINTA, 2017). The nutritional compositon of the oat is well balanced. Among all the cereals, the oat is not only the cereal with the highest protein content but also with the most qualitative ones (WEBSTER, 2009; IMMERSTRAND, 2010). In regards to the lipid content the oat is very rich in unsaturated acids, minerals and vitamins (HEAD ET AL., 2010; GADDAM ET AL., 2016). Also, recent researches show its utility in complementary therapies. As a result it is lowering the blood cholesterol as well as the gflucose and insuline levels in the blood (CHEN ET AL. 2008). Oat flour fine grounded can be used as ingredient in cosmetic products. As secondary products of oat processing there are the straw and chaff. The straws have a high nutritional fodder value, being superior to wheat and rye (SANDU,1993).

The multiple benefits of the oat open tha way to crating valuable genotypes both qualitative and quantitative.

MATERIAL AND METHODS

The research was conducted at Agricultural Research and Development Station Lovrin, on a weakly-gleizated and weakly-alkalinized semicarbonatic chernozem, medium enriched with Azoth and Phosphorus, with a PH determinate in the water of 6,8. The initial plants are part of the oat variety collection already in place at A.R.D.S. Lovrin. As working method we used the hybridization followed by selection in segregated generations.

For both, the parents and descendants the main qualitative and quantitative features followed were not only production capacity, quality, precocity, resistance in case of disease, scorching heat but also hibernation and high twin capacity in the spring. The experience layout was a Latin rectangle, in 4 repetitions, 15 variants, and harvest surface of 10 m square.
In interpreting the results the variant analysis method (Duncan test) was used.

RESULTS AND DISCUSSIONS

The current paper contains 15 perspective lines of the autum oat production analysis, using as witness the Sorin variety, the only autumn oat variety in our country.

Table 1

Sourse	Liberty degrees	Squares sum	Variant s^2	F Test	
				Value	Signification
Repetition	3	727166.667	242388.889		
Factor a	14	47028333.333	3359166.667	58.0517	***
Error	42	2430333.333	57865.079		
Toatal	59	50185833.333			

Statistical processing and experimental data are performes by analysis of the variant (Ciulca, 2006). From variant analysis presented into the Table 1 for the 15 lines between the 15 genotypes accounted into the study, we were able to detect very significant diferences.

The variation coefficient, with a value of 4.7% (<10%) points towards a very low variation of experimental values.

Table 2

Productions obtained to comparative contest crop with autumn oat lines

Nr. Crt.	Variant	Kg/ha	%	The difference toward the control	Signification
1	2501 (mt. Sorin)	5900	100		
2	2502	5325	90	- 575	00
3	2503	7100	120	+ 1200	xxx
4	2504	5850	99	- 50	
5	2505	6000	101	+ 100	
6	2506	5100	86	- 800	000
7	2507	4350	73	- 1550	000
8	2508	3850	65	- 2050	000
9	2509	4700	79	- 1200	000
10	2510	5300	89	- 600	00
11	2511	5700	96	- 200	
12	2512	4350	73	- 1550	000
13	2513	5700	96	- 200	
14	2514	3750	63	- 2150	000
15	2515	5900	100	0	

DL 5% = 343.3
DL 1% = 459.6
DL 0.1% = 602.3

As we can see from the data in the Table 2 there is a clear outline in the 2503 line with a difference compared to the witness of 1200kg/ha and an increase of 20%, both values statistically significant 2505 and 2015 lines were in regards to production analysis at the witness level, the Sorin variety.

The analysis of the rest of the lines shows more inferior yields compared with the witness, statistically assured to be negative in significance.

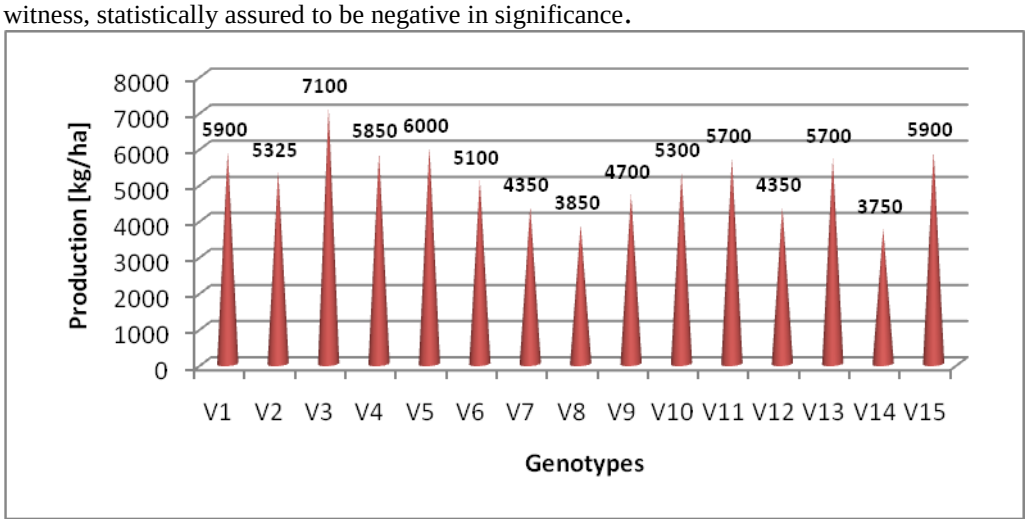

Fig. 1 Production variation(kg/ha) to all 15 perspective lines of autumn oat

By grouping the variety with Duncan Test 6 signification classes are underlined , marked as a t f , as it can be clearky seen in the data for the Table 3.

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Table 3

	Original data		Processed data		
N^0	Genotipy	Production (kg/ha)	N^0	Variant	Production (kg/ha)
V 1	2501 (mt. Sorin)	5900 b	V3	2503	7100 a
V 2	2502	5325 c	V5	2505	6000 b
V 3	2503	7100 a	V1	2501	5900 b
V 4	2504	5850 b	V15	2515	5900 b
V 5	2505	6000 b	V4	2514	5850 b
V 6	2506	5100 c	V13	2513	5700 b
V 7	2507	4350 e	V11	2511	5700 b
V 8	2508	3850 f	V2	2502	5325 c
V 9	2509	4700 d	V10	2510	5300 c
V 10	2510	5300 c	V6	2506	5100 c
V 11	2511	5700 b	V9	2509	4700 d

V 12	2512	4350 e	V12	2512	4350 e
V 13	2513	5700 b	V7	2507	4350 e
V 14	2514	3750 f	V8	2508	3850 f
V 15	2515	5900 b	V14	2514	3750 f

The results from the data analysis shown in the Table 3 show that V3 genotype classifies into production class a, with 7100 kg/ha. The increase achieved in this variety is significantly different compared to the rest of the variants.

The B class, with yield between 5700 and 6000 kg/ha comprises the most of the studied genotypes: V1, V5, V15, V13, V4, V11. The production increase in B class variety is significantly different compared to all the variety not comprised to this class.

Yield between 5100 - 5300 kg/ha cand be atributed to V2, V6 and V10 genotypes, all of them belonging to C class.

D class has only one representative genotype, namely V9, with a production of 4700 kg/ha, very negative increase compared to the rest of the analysed classes.

The less productions can be found in the F class genotypes (V14,V8), where we have recorded productions of 3750 and 3850 kg/ha respectively.

CONCLUSIONS

As a result of the current study of the 15 autumn oat lines, created and tested to Agricultural Research and Development Station Lovrin, the genotypes 2503, 2505 and 2015 are remarked, being considered as high potential yield lines, excellent wintering resistance, good twin capacity in the spring, with great perspective for homologation.

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