RESEARCHES REGARDING THE INFLUENCE OF FERTILIZATION ON THE YIELD AND ON THE OIL CONTENT OF THE SUNFLOWER

CERCETĂRI PRIVIND INFLUENȚA FERTILIZĂRII ASUPRA RECOLTEI ŞI A CONȚINUTULUI DE ULEI LA FLOAREA SOARELUI

M. BÎTE. I. BORCEAN

Banat's University of Agricultural Sciences and Veterinary Medicine, Timişoara

Abstract: *În lucrare sunt prezentate rezultatele obținute la doi hibrizi de floarea soarelui, Performer şi Banat, cultivați pe două niveluri de fertilizare cu fosfor şi potasiu şi patru niveluri de fertilizare cu azot. În medie pe nivelurile de fertilizare cu recolta la hibridul Banat a fost mai mare cu 13%, comparativ cu recolta hibridului Performer. Dublarea dozelor de fosfor şi potasiu, de la $P_{50}K_{50}$ la $P_{100}K_{100,}$ a determinat, în medie pe nivelurile de fertilizare cu azot, creşterea recoltei cu 25%. Îngrăşămintele cu azot au influențat favorabil recolta, aplicate în domeniul de cercetare $N_0 – N_{100.}$*

Abstract: *The paper presents the results obtained for two sunflower hybrids, Performer and Banat, cultivated on two fertilization levels, with phosphorus and potassium and on four levels of fertilization with nitrogen. The average yield for the fertilization levels of Banat hybrid was 13% higher than that of the Performer hybrid. By doubling the doses of phosphorus and potassium from $P_{50}K_{50}$ to $P_{100}K_{100}$a, there has been obtained an average yield for the nitrogen fertilization levels increased with 25%. The fertilizers having a content of nitrogen have favourably influenced the yield when applied in the researched field $N_0 – N_{100}$.*

Key words: *sunflower, fertilization with NPK.*
Cuvinte cheie: *Floarea soarelui, fertilizare cu NPK.*

INTRODUCTION:

In the conditions of our country, the sunflower reacts favourably at fertilization, but not so well as other species. The researches have been carried out during the experimental cycle 2005-2007, a period of time during which important anomalies regarding the average monthly temperatures and the multi-annual monthly precipitations have been encountered. These anomalies have influenced the level of yields and the oil content.

MATERIALS AND METHODS:

The experiments were trifactorial, organized according to the subdivided plot method, and three repetitions were done. The A factor has been represented by the hybrid with two graduations (Performer and Banat), the B factor B by the phosphorus and potassium fertilization level with two graduations ($P_{50}K_{50}$, P_{100}, K_{100}), and the C factor, by four graduations (N_0, $N_{50,}$ $N_{100,}$ N_{150}).

The precursory cultivated plant was the winter wheat.

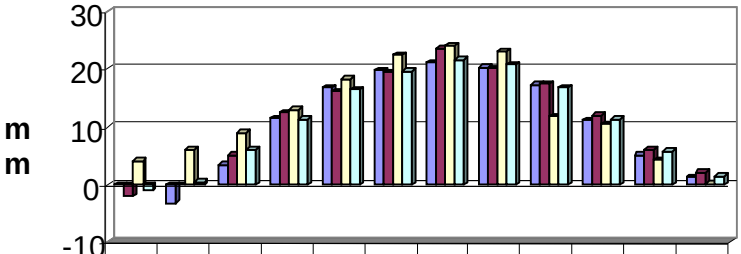
The climatic conditions of the experimental cycle are presented in the figures 1 and 2.

RESULTS AND DISCUSSIONS:

Table 1 gives the yield results of the experimental cycle. It results that, on all fertilization levels, the yield of the Banat hybrid was over 250 kg/ha higher than that of the Performer hybrid.

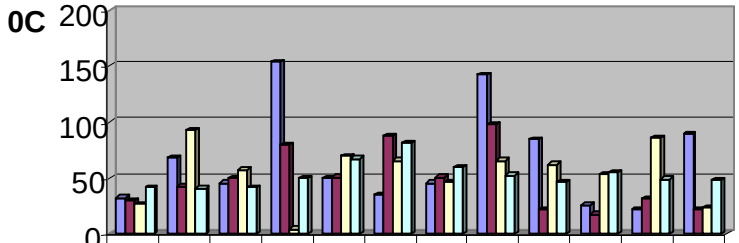
By doubling the P and K doses, the yield has significantly increased, by 440 kg/ha. The nitrogen fertilizers have been well used, being applied in doses of N_{50} and N_{100}. An

increase of the doses to N_{150} is not justified, the yield differences as compared to the reference sample being practically the same. The variation of the oil content is presented in fig. 3. It results that the nitrogen fertilizers decreased the oil content, and the phosphorus and potassium fertilizers have positively influenced it.



	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
200	0	-3,3	3,	11	1	20	2	20	17	11	5	1,3
200	-	0	4	12	7	20	1	20	18	12	6	2
2007	4	6	9	13	18	23	24	23	12	11	4,2	0,1
Multi-annual average	-1,2	0,4	6	11	17	20	22	21	17	11	5,7	1,4

Fig.1 The average monthly temperatures registered by the Meteorological Station from Timişoara in the years 2005 and 2006 and its comparison to the multi-annual average values.



	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2005	32	68	46	154	50	35	45	142	85	26	21	89
2006	30	42	49	79	50	88	50	98	21	17	31	21
2007	26	92	57	4	69	65	46	65	62	53	86	23
Multi-annual average	41	40	42	50	67	81	60	52	46	55	49	48

Fig.2. The monthly precipitations registered by the Meteorological Station from Timişoara in the years 2005, 2006 and 2007 and their comparison to the multi-annual average values.

Table 1

The yield results obtained during the experimental cycle 2005-2007 depending on varieties and on fertilization

The A factor	The B factor	The C factor					The averages of the A factor			
		N_0	N_{50}	N_{100}	N_{150}	N_{200}	Yield Kg/ha	%	Difference Kg/ha	Signification
Performer	$P_{50}K_{50}$	1566	1841	2048	2058		1947	100		
	$P_{100}k_{100}$	1697	2028	2170	2171					
Banat	$P_{50}K_{50}$	1693	2117	2322	2325		2203	113	256	XX
	$P_{100}k_{100}$	1752	2298	2543	2577					

DL 5% = 83 kg/ha DL 1% = 154 kg/ha DL 0.1% = 341 kg/ha

The averages of the C factor

Specification	N_0	N_{50}	N_{100}	N_{150}
Yield kg/ha	1677	2071	2271	2283
%	100	123	135	136
Difference kg/ha		394	594	606
Signification		XX	XXX	XXX

DL 5% = 100 kg/ha DL 1% = 184 kg/ha DL 0.1 % = 409 kg/ha

The averages of the B factor

Specification	$P_{50}K_{50}$	$P_{100}k_{100}$
Yield kg/ha	1735	2175
%	100	125
Difference kg/ha		440
Signification		XXX

DL5%= 71 kg/ha DL 1% = 130 kg/ha DL 0.1% = 289 kg/ha

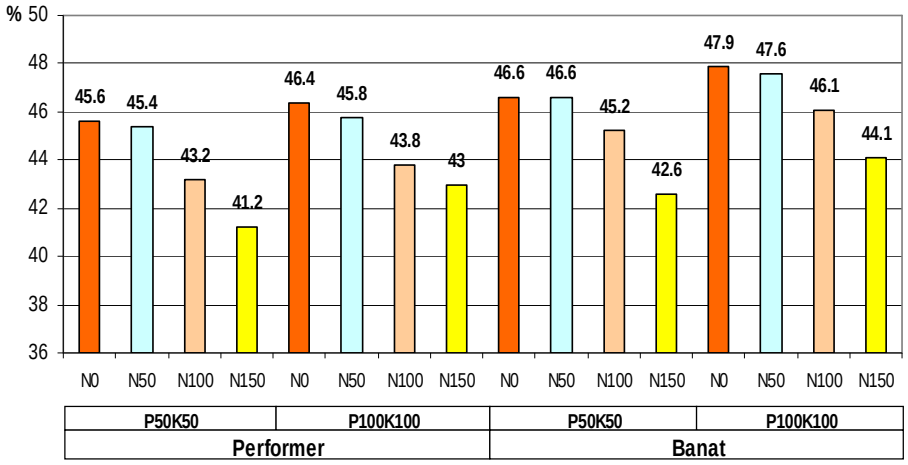


Fig.1. The variation of the oil content depending on the hybrid and on the fertilization during the experimental cycle 2005 – 2007

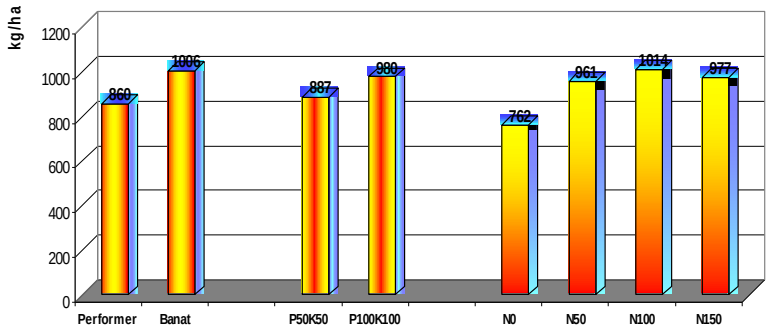


Fig.4. The oil production

The results show an increase of the oil production by doubling the doses of phosphorus and of potassium as well as under the influence of nitrogen $N_0 – N_{100}$ fertilizers.

CONCLUSIONS

1. The Banat hybrid ensures yields that are 13% higher than those obtained in the case of the Performer hybrid.
2. The fertilizers containing N in quantities of $N_0 – N_{100}$ have increased the yield of grains and the oil production for both hybrids. The increase of N_{150} doses is not justified.
3. By doubling the phosphorus and potassium doses from $P_{50}K_{50}$ to $P_{100}K_{100}$ the yield was increased by 25% and the oil production by 10%.

LITERATURE

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