LONG - TERM REZULTS OF RESEARSCH ON NS-HYBRID OF SUNFLOWER IN BANJALUKA AREA

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Abstract

A larger production of sunflower is practicable if used with corresponding agrotechnical mesures and choice of suitable hybrids under existing agroecological conditions. On that account, in the period off 7 years micoanalyses of various NS- sunflower hybrids which have already been in macroproduction, as well as the ones newly - selected, to be used yet, were couducted in the area of Banjaluka.

Of all ecamined, NS-H-27 RM and NS-H-26 RM hybrids gave the largest und the most stable yield in the period of 7 years. However, the biggest yield in the period, of 1 years was given by NS-H-43 hybrid (5.592 kg/ha) in 1993, while the grains of Helios hybrid, NS-H-126 and NS-H-111 B contained the largest quantities of oil in average.

Doing research on and recommending the production of hybrids that give the higest yield in Banjaluka area, we have been making conditions for a larger more profitable production of sunflower, an important agricultural oil crop.

Key - Wards: sunflower, hybrid, crops, production, oil, area.

Introduction

Sunflower production does not have a long tradition in Banjaluka area. Teh sowing started fifteen years ago on small sowing areas and small crops. Neverthelles, in the past four years sowing areas have ectended at about 200 ha with approocimate crops of 2 t/ha, mostly in Kozarska Dubica. It being a cousequence of insufficient organization of experience, tradition and technological equipment for production of this very important oil crop.

The aim of this lon-continued research was to establish the genetically potential of crop, and other characteristice of newly-selected hybrid. Considering the variability of climate factors in suflower production special

attenton was given to the selection of hybrids which is of great importance for genetically potential of crops wich is now used by only 50%.

Material and methods

Field researches were made in a period of time 1987-1994. on the brown - degroded soil of the Agricultural institut Banjaluka, in average: acid reaction (pH=5,16), low humus (2,1%) and phosphor (P_2O_5=6,1) and well contents calium (K_2O=23,8%), table 1. at the altitude of 154 m, flat area.

42 hybrids of sun flower have been examind, 15 each year, mostly various new hybrids. Experiments were done random block system with 4 repetitions. The plain of the parcel was 14 m^2 (5x2,8), row distinction 70 cm, each row 35 cm. Standard agrotechnics have been used such as in mercantile production with presowing NPK fertilisers. Total crops were 81 kg N/ha, 105 kg P_2O_5/ha and 70 kg K_2O/ha. Crops were accounted by 11% humidity with statistical processing by method of variance analyses.

The climate during the vegetational period of research (1987-1994), accarding to the information of meteorological station Banjaluka were various (tab. 1). Average monthly air temperature was on the lavel of annual average of Banjaluka region. Recipitation quantity during the vegetation period (IV-IX month) of sunflower has been variating between deficit in 1990. up to optimal quantities in 1989. Teh largest deficit of recipitation was in august 1992. wwith 6,4 mm. Concering the annual recipitation, may and avgust were the most deficiency months in Banjaluka region. Nevertheless, total quantities of recipitations are satisfying, some what unfavourable periods (Kondic, 1991).

Table 1. Main climate indicators in the vegetation of sunflower

climate indicators	year	month						average total
		IV	V	VI	VII	VIII	IX	
average monthly temperature (°C)	1987.	11,5	14,6	19,1	25,0	19,7	20,0	18,3
	1988.	10,5	16,6	19,0	23,2	16,6	16,6	17,1
	1989.	13,3	14,7	17,8	21,0	20,2	16,0	17,2
	1990.	10,9	17,3	19,3	20,3	20,5	15,5	17,3
	1992.	12,2	15,8	19,6	21,4	25,4	17,0	18,6
	1993.	12,3	18,1	20,7	21,2	21,1	17,0	18,4
	1994.	11,4	16,8	19,9	22,9	22,9	19,2	18,8
average:		11,7	16,3	19,3	22,2	20,9	17,3	17,9
Average of 50 years:		11,4	15,7	19,1	21,1	20,5	16,2	17,3
recipitation quantities in mm	1987.	91,0	164,0	61,0	65,0	57,0	34,0	472,0
	1988.	58,0	83,0	111,4	25,5	75,3	91,7	444,9
	1989.	57,6	175,9	92,2	109,0	123,0	121,0	678,7
	1990.	85,6	41,4	87,5	76,7	32,6	66,0	389,8
	1992.	80,0	36,1	181,7	81,9	6,4	49,5	435,6
	1993.	55,7	47,5	107,1	106,7	106,8	160,4	586,0
	1994.	90,9	48,9	116,3	69,8	55,8	121,0	502,7
average:		74,1	85,3	108,2	76,4	65,3	91,9	501,2
Average of 50 years:		88,0	100,0	123,0	74,0	81,0	81,0	457,0

Discussion of research results

In table 2. average seven years period of grain crops with 11% of humidity amoug the hybrids ara shown. Among some hybrids, the differences between crops in 2 years period were 18-1114 kg of grains/ha. Average grain crop in 1988. was 3.184 kg/ha and in 1988. up to 4.298 kg/ha in 1988. The difference was more than 1 t. of dry grain. With the most of examined hubrids crop was between 3,5-4,5 t/ha. Olivko hybrids and NS-H-163 were examiend in 1994. with the lowest crops of 3 t/ha. During the 7 years period only 4 hybrids (NS-H-17, NS-H-26 RM, NS-H-27 RM and NS-H-45) were examined coustantly and on the other hand each year 1/3 of sortiment has been changing. The most stable crops was realised with NS-H-17 and NS-H-45, and somewhat smaller with NS-H-27 RM and NS-H-26 R. NS-H-43 gave the best crops in one years period (5.592 kg/ha)

Average oil percentage in the grain was between 43,26% (NS-H-17) up to 45,45% (NS-H-26 RM). Also, some other hybrides have proven to have a food oil percentage, like Helios (49,09%), NS-H-126 (48,85%), NS-H-111 B

(47,78%), NS-H-138 B (47,39%) and NS-H-Hugo (47,23%), table 3. The average oil percentage has been changing during the years as well as by use of various hybrids, from 42,81% (1987.) - 48, 63% (1992), with is because of the influence of ecternal factors.

According to the results of Skoric (1995.) and Kondic (1990) it is not possible to give the exact estimation or to implement new hybrids of sunfower in macroproduction without results of ecamination of presently ecisting hybrids in annual macro and micro researches in each agroecological area.

Conclusion

Considering the annual results of micro research of NS- hybrids in Banjaluka region, the conclusion is as follows:

Significant differences in crops and average oil contents were made. The largest crops were given by NS-H-17 and NS-H-45, and the largest oil contents by NS-H-26 RM. When it comes to one years production the best were NS-H-43, Helios, NS-H-126 and NS-H-111 B.

Consequently, Banjaluka region has proven to be suitable for rentabilè and qyality sunflower prodyction on larger soil plots, witch directly influences oil production, and indirectly is expouding range of agrcultural crops.

Literature

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Table. 2 Influence on NS - hybrids on the sunflower crops

		grain crops with 11% hymidity (kg/ha)							ave-
no	hybrid	1987.	1988.	1989.	1990.	1992.	1993.	1994.	age
1.	NS-H-15	4.756	4.794	4.174	3,325	-	4.164	-	4.242
2.	NS-H-17	4.655	4.901	3,585	3,324	3.975	4.490	3.530	4.066
3.	NS-H-26 RM	4.275	3.902	3.143	3.676	3.388	3.796	3.560	3.677
4.	NS-H-27 RM	4.225	4.259	3.241	3.486	3.143	4.694	3.470	3.788
5.	NS-H-33 RM	3.946	4.073	2.947	3,405	-	3.633	3,910	3.652
6.	NS-H-45	3.997	4.660	4.419	3.326	3.510	4.000	4.100	4.002
7.	NS-H-57	4.326	4.555	2.601	-	-	-	-	3.827
8.	NS-H-58	4.199	5.197	2.750	-	-	-	-	4.049
9.	NS-H-60	4.098	5.090	3.978	-	-	-	-	4.389
10.	NS-H-61	3.719	4.074	3,798	-	-	-	-	3.864
11.	NS-H-64	3.086	3.348	2.633	-	-	-	-	3.022
12.	NS-H-65	4.048	3.535	2.897	-	-	-	-	3.493
13.	NS-H-66	3.592	3.703	2.848	-	-	-	-	3.381
14.	NS-H-66	3.820	4.313	3.093	-	-	-	-	3.742
15.	NS-H-70	4.022	4.072	2.651	-	-	-	-	3.582
16.	NS-H-101	-	-	-	4.081	-	-	-	4.081
17.	NS-H-100	-	-	-	3.973	-	-	-	3.973
18.	NS-H-102	-	-	-	4.270	2.653	-	-	3.461
19.	NS-H-104	-	-	-	3.865	3.837	4.449	-	4.050
20.	NS-H-99	-	-	-	3.811	3.469	-	-	3.640
21.	NS-H-44	-	-	-	4.000	-	-	-	4.000
22.	NS-H-97	-	-	-	3.162	3.428	-	-	3.295
23.	Helios	-	-	-	4.135	3.674	-	-	3.904
24.	NS-H-43	-	-	-	3000	3.061	5.592	3.890	3.886
25.	NS-H-111 B	-	-	-	-	3.633	4.735	3.130	3.833
26.	NS-H-126	-	-	-	-	3.551	.	.	3.551
27.	NS-H-138 B	-	-	-	-	2.694	4.245	-	3.469
28.	NS-H-213	-	-	-	-	3.918	-	-	3.518
29.	NS-H-162	-	-	-	-	4.041	-	-	4.041
30.	NS-H-53	-	-	-	-	-	3.306	-	3.306
31.	Soldato	-	-	-	-	-	3.714	-	3.714
32.	NS-H-Hugo	-	-	-	-	-	3.673	-	3.673
33.	NS-H-Dukat	-	-	-	-	-	3.959	-	3.959
34.	NS-H-109 K	-	-	-	-	-	4.816	-	4.816
35.	NS-H-06	-	-	-	-	-	-	3.630	3.630
36.	NS-H-08	-	-	-	-	-	-	3.590	3.590
37.	Goleador	-	-	-	-	-	-	3.290	3.290
38.	Olivko	-	-	-	-	-	-	2.870	2.870
39.	NS-H-149	-	-	-	-	-	-	3.840	3.840
40.	NS-H-163	-	-	-	-	-	-	2.970	2.970
41.	NS-H-164	-	-	-	-	-	-	3.440	3.440
42.	NS-H-170	-	-	-	-	-	-	3.600	3.600
	overage:	4.051	4.298	3.184	3.488	3.453	4.280	3.521	-
	LSD-5%	469	742	225	445	777	777	412	-
	-1%	633	993	301	594	1.039	1.049	565	-

Tab. 3. Contents oil in grain sunflower

no.	hybrid	oil contents / year (%)						average
		1987.	1988.	1990.	1992..	1993	1994.	
1.	NS-H-15	40,48	36,60	40,51	-	39,95	-	39,38
2.	NS-H-17	40,29	38,80	40,84	50,77	45,41	43,46	43,26
3.	NS-H-26 RM	48,48	34,60	38,73	51,04	46,51	44,36	45,45
4.	NS-H-27 RM	44,41	43,50	49,15	52,60	41,25	44,04	45,32
5.	NS-H-33 RM	41,83	44,50	40,84	-	43,33	40,53	42,20
6.	NS-H-45	44,29	39,30	43,75	49,18	42,14	41,49	43,36
7.	NS-H-57	39,61	44,10	-	-	-	-	41,85
8.	NS-H-58	39,33	44,50	-	-	-	-	41,19
9.	NS-H-60	43,54	41,90	-	-	-	-	42,72
10.	NS-H-61	36,78	45,00	-	-	-	-	40,89
11.	NS-H-64	38,18	44,70	-	-	-	-	41,44
12.	NS-H-65	47,09	47,80	-	-	-	-	47,44
13.	NS-H-66	47,28	45,90	-	-	-	-	46,59
14.	NS-H-68	46,18	43,20	-	-	-	-	44,69
15.	NS-H-70	44,44	43,60	-	-	-	-	44,02
16.	NS-H-101	-	-	44,70	-	-	-	44,70
18.	NS-H-102	-	-	43,25	49,40	-	-	46,32
19.	NS-H-104	-	-	41,73	47,67	42,21	-	43,87
20.	NS-H-99	-	-	43,70	47,27	-	-	45,48
21.	NS-H-44	-	-	45,91	-	-	-	45,91
22.	NS-H-97	-	-	42,11	49,14	-	-	45,62
23.	Helios	-	-	46,80	51,38	-	-	49,09
24.	NS-H-43	-	-	41,58	48,16	43,39	40,40	44,13
25.	NS-H-111	-	-	-	50.51	47.13	45,771	47,78
26.	NS-H-126	-	-	-	48,85	-	-	48,85
27.	NS-H-138 B	-	-	-	47,74	47,04	-	47,39
28.	NS-H-213	-	-	-	42,55	-	-	42,55
29.	NS-H-162	-	-	-	43,15	-	-	43,15
30.	NS-H-53	-	-	-	-	45,66	-	45,66
31.	Soldato	-	-	-	-	47,33	-	47,33
32.	NS-H-Hugo	-	-	-	-	47,23	-	47,23
33.	NS-H-Dukat	-	-	-	-	43,58	-	43,58
34.	NS-H-109 K	-	-	-	-	44,86	-	44,86
35.	NS-H-06	-	-	-	-	-	44,21	44,21
36.	NS-H-08	-	-	-	-	-	44,16	44,16
37.	Goleador	-	-	-	-	-	40,07	40,07
38.	Olivko	-	-	-	-	-	40,98	40,98
39.	NS-H-194	-	-	-	-	-	45,73	45,73
40.	NS-H-163	-	-	-	-	-	39,87	39,87
41.	NS-H-164	-	-	-	-	-	46,90	46,90
42.	NS-H-170	-	-	-	-	-	45,72	45,72
	average:	42,81	43,13	43,04	48,63	44,67	42,97	-