

Selection of Sunflower Hybrids for Bosna I Herzegovina (BiH).

Jovan KONDIC, Professor, Agricultural Institute Banja Luka
Bosna I Herzegovina

Summary

Area of BiH has favourable climate and soil conditions for sunflower production. BiH has also a modern oil factory "Bimal"-Brcko for sunflower processing, for food oil production and crushed oil seeds (proteins) for livestock feed. Unfortunately, BiH imports currently all needed oil and crushed oilseed quantity, although there are possibilities to produce enough quantities for our needs, on our own fields, and even maybe to export. It has been expected that integrated production and processing of sunflower could become a prosperity production for BiH.

Our objectives were to test hybrids from Novi-Sad for yield potential and adaptation to BiH. Results show that there are significant differences in yield and oil content among examined varieties. Over a three years period, the highest yield was obtained by NS-H-411 and NS-H-45, and the highest yield contents were obtained from NS-H-45 and NS-H-43.

Introduction

Thanks to long-term selection at the Agricultural Institute in Novi-Sad, there is a great selection of high yielding sunflower hybrids under BiH agro-ecological conditions. Through long-term examination, we try to select high yielding and very adaptable hybrids, and that selection enables the higher usage of genetic potential. In the same time all new confirmed hybrids are introduced at the production level.

Materials and methods

Field trials were performed during the 1997-99 period on brown demotion soils with acid reaction (pH=5.05), with lack of humus material (2.5 %) and phosphorus ($P_2O_5 = 7.6\%$) and with an average supply in Potassium (18.8 %). Elevation of the experimental field is 154 meters.

15 NS hybrids were tested compared to confirmed hybrids. Trials were performed according to a randomized block design with four replicates. Area of individual plot was 14 m² (5m*2.8m), distance between row was 70cm and distance between plants in the same row was 35 cm.

Standard cropping management was applied, as in farmers' production.

Climatic conditions were optimal during the period (Table 1) : average monthly temperatures were close to the long-term average and rainfall was at least 349 mm during the growth period of sunflower. However, there was a lack of rain in august 1998 an 1999, but that did not have a negative influence on yield, due to satisfactory rainfall in previous months.

Table 1 : Climatic conditions (Banja Luka)

Year		Month					
		April	May	June	July	August	Sept.
1997	Av. Temp. (°C)	7.2	16.9	20.6	20.7	20.3	16.1
	Rain (mm)	122.1	90.1	87.7	103.5	103.5	43.8
1998	Av. Temp. (°C)	13.4	15.4	21.2	22.6	16.1	108.5
	Rain (mm)	83.3	82.7	104.3	81.1	37.4	167.3
1999	Av. Temp. (°C)	12.5	17.0	14.8	21.2	21.3	18.4
	Rain (mm)	117.6	74.9	191.5	127.2	19.5	108.5
Av. 97-99	Av. Temp. (°C)	11.0	16.4	18.9	21.2	20.5	16.2
	Rain (mm)	107.6	82.6	127.8	103.9	53.5	106.5
Long Term Av.	Av. Temp. (°C)	11.4	15.7	19.1	21.2	20.5	16.2
	Rain (mm)	88.0	100.0	123.0	74.0	81.0	81.0

Results and discussion

Long term examination of NS hybrids shows the great possibilities in sunflower production in BiH. High yield of seed and oil shows that it is possible to perform profitable production of sunflower in this country, which confirms previous examinations (Skoric et al. 1995, 1997, 1998, Kondic 1990, 1996).

Achieved results show that examined hybrids : NSH111, NSH26RM, NSH45 and Bacvanin give higher yields (Table 2). Yields of those hybrids are between 4103 and 4540 kg/ha, significantly higher than the average yield (3000 kg/ha).

Oil content among examined hybrids varied from 39.88 % (NSH15) to 50.48 % (NSH514). The highest oil content was registered with NSH 514, NSH43, NSH704, Krajisnik, Velja and NSH45. The highest oil yield is achieved by NSH492, NSH704, NSH111, Bacvanin and NSH26RM (Table 3).

Table 2 : Yield of sunflower hybrids

N°	Hybrid	Seed yield at 11 % H2O (kg/ha)			Average
		1997	1998	1999	
1	NSH15	3.700	4.050	-	3.875
2	NSH17	4.450	3.070	3.060	3.527
3	NSH26 RM	4.540	4.260	-	4.400
4	NSH43	4.680	3.000	3.170	3.617
5	NSH45	4.590	3.320	4.400	4.103
6	NSH111	4.840	4.610	4.170	4.540
7	NSH492	-	4.040	4.690	4.365
8	VELJA	4.550	2.900	2.800	3.417
9	KRAJISNIK	4.290	4.190	2.990	3.823
10	BACVANIN	-	4.710	4.060	4.385
11	BANACANIN	-	3.250	3.610	3.430
12	NSH514	3.720	3.910	-	3.815
13	NSH704	-	-	4.240	4.240
14	NSH710	-	-	4.120	4.120
15	NSH714	-	-	4.120	4.120
	AVERAGE	4.373	3.776	3.793	
	LSD 5%	4,8	4,71	4,52	
	LSD 1%	6,4	6,30	6,05	

Table 3 : Oil content in sunflower seeds (%)

N°	Hybrid	Oil content (%)			Average	
		1997	1998	1999	Oil content (%)	Oil yield (kg/ha)
1	NSH15	41,23	38,53	-	39,88	1.375
2	NSH17	47,47	41,07	43,84	44,13	1.385
3	NSH26 RM	48,73	38,16	-	43,44	1.701
4	NSH43	43,16	46,30	46,44	45,30	1.458
5	NSH45	46,84	44,61	44,61	45,20	1.650
6	NSH111	45,64	45,64	37,88	43,05	1.739
7	NSH492	-	42,91	46,84	44,87	1.743
8	VELJA	52,05	42,93	41,83	45,60	1.387
9	KRAJISNIK	48,19	42,95	47,62	46,25	1.574
10	BACVANIN	-	42,93	45,87	44,40	1.733
11	BANACANIN	-	37,37	46,86	42,11	1.285
12	NSH514	51,97	48,99	-	50,48	1.714
13	NSH704	-	-	46,12	46,12	1.740
14	NSH710	-	-	41,82	41,82	1.533
15	NSH714	-	-	45,39	45,39	1.701

Conclusions

Regarding perennial examination of sunflower hybrids it is possible to draw following conclusions :

1- There are satisfactory climates, soils and pre-working conditions for sunflower production in BiH area.

2- The number of 8 examined hybrids achieved higher yields over 4 T/Ha, and 7 others had yields higher than 3 T/Ha.

3- Regarding examined hybrids with different duration of vegetation, it is possible to grow sunflower in flat land areas, as well as in hilly parts, up to 500 meters elevation.

4- High genetic potential of fertility among examined hybrids could be achieved by right selection of hybrids and through application of modern technology. In production technology it is necessary to take into consideration quality and optimal crop management, starting with soil processing, fertilizers, sowing rate and date, weed protection and harvest.

References

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