

SELECTION OF SUNFLOWER HYBRIDS FOR THE BOSNIA AND HERZEGOVINA AREA

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Abstract

The Bosnia and Herzegovina area doesn't have regular sunflower production, although this area has favorable climate and soil conditions for profitable production. Based on achieved long-term results of tested NS-hybrids of sunflowers in a micro-trial within the area of Bosnia and Herzegovina, we found out the following: maximum average yield for a three-year period was obtained by hybrids NS-H-43 and NS-H-111; maximum oil content in grain during the period of three years was in hybrids NS-H-930 and Krajsnik; and maximum oil yield in hybrids NS-H-111, NS-H-930 and NS-H-43. In the Bosnia and Herzegovina area it is possible to achieve profitable production of sunflower on wider sowing areas, which would provide the necessary quantity of oil and plant proteins for production of livestock fed from our own ploughed fields.

Introduction

Thanks to long-term selection work of the Novi Sad Agricultural Institute, today in Bosnia and Herzegovina we have a great selection of high-yield sunflower hybrids for production in our agro-ecological conditions. Through long-term examination we try to select high yield and very adaptable hybrids of sunflower for our agroecological area in Bosnia and Herzegovina. That selection enables the higher usage of genetic potential of fertility.

Materials and Methods

We performed field trials during the period of 2001-2003, on brown demotion soil with acid reaction (pH=4,1), lack of humus material (2.1%) and phosphorus ($P_2O_5=5.2\%$), average potassium (17.8%), and an altitude of 154 meters.

We tested 15 NS-hybrids, with the regular introduction of new confirmed sunflower hybrids. Trials were performed in a randomized block system with four replications. The area of the plot was 14 m sq. (5 x 2 x 8m) with a distance between rows of 70 cm, and distance within one row of 35 cm. Standard, intensive agricultural measures were applied, the same as for regular production.

Climate Conditions. The main climate indicators show that the tests were performed in optimal climatic conditions (Table 1). Average monthly temperatures were on the level of annual average temperatures. Precipitation during vegetation was satisfactory and was 44.5 mm higher compared to the long term average. Lack of precipitation was noted in June 2002 and 2003, and July and August 2002 and 2003 (Table 1b).

Table 1. The main meteorological indicators.

a) Average Monthly Temperature (C)

No	Year	Month					
		IV	V	VI	VII	VIII	IX
1.	2001	10.9	17.5	18.4	21.8	23.0	14.7
2.	2002	10.1	17.9	21.3	22.4	20.7	15.3
3.	2003	11.0	18.9	24.2	23.1	24.5	15.5
	Average	10.7	18.1	21.3	22.4	22.7	15.2
	Perennial average	10.9	16.1	19.3	21.4	21.1	16.7

b) Precipitation (mm)

No	Year	Month					
		IV	V	VI	VII	VIII	IX
1.	2001	137.4	58.4	238.4	40.6	26.4	253.6
2.	2002	174.1	154.2	53.4	72.0	128.2	171.8
3.	2003	56.7	75.0	35.9	50.5	48.6	93.4
	Average	122.7	95.9	109.2	54.4	67.7	172.9
	Perennial average	80.3	95.0	113.7	87.1	71.6	90.6

Results and Discussion

Perennial trials of NS-hybrids show great possibilities in sunflower production within the area of Bosnia and Herzegovina. High yield of seed and oil show that it is possible to achieve profitable production of sunflower in Bosnia and Herzegovina, which was confirmed by previous trials run by Skoric (1995, 1997, and 1999), and Kondic (1990, 1996, and 2000).

Achieved results show that tested hybrids: NS-H-43, NS-H-411, Labud and Banacanin, had the highest oil content (Table 2). Yield of these hybrids is between 3.742 to 4.062 kg/ha (Table 2).

Table 2. Influence of hybrids on sunflower yield.

No	Hybrid	Grain yield with 11% moisture (kg/ha)			Average
		2001	2002	2003	
1.	NS-H-17	2.950	3.310	-	3.130
2.	NS-H-43	4.390	4.420	3.375	4.062
3.	NS-H-45	4.150	3.800	3.105	3.352
4.	NS-H-111	4.270	4.240	3.474	3.995
5.	Velja	3.710	3.710	2.754	3.391
6.	Kraisnik	3.350	3.940	2.664	3.318
7.	Bacvanin	4.170	3.520	3.015	3.568
8.	Banacanin	4.050	3.440	3.735	3.742
9.	Labud	-	4.060	3.609	3.834
10.	Olivko	-	3.920	2.826	3.373
11.	Mirko	-	3.360	3.294	3.327
12.	NS-H-924	3.960	-	3.411	3.685
13.	NS-H-930	4.240	3.940	2.889	3.690
14.	NS-H-1300	4.210	-	2.799	3.504
15.	NS-H-1312	-	2.720	2.157	2.438
	Average:	3.950	3.721	3.079	
	LSD 5%	546	249	399	
	1%	713	330	530	

Oil content of tested hybrids was between 46.95% (Velja) and 56.55% (NS-H-1312). The highest oil content was in the following hybrids: NS-H-1312, NS-H-17, NS-H-930, Miro, NS-H-1300, and NS-H-111 (Table 3).

Table 3. Oil content of the hybrids

No	Hybrid	Oil content in %			Average	
		2001	2002	2003	Oil content %	Oil (kg/ha) yield
1.	NS-H-17	58.52	50.11	-	54.31	1.670
2.	NS-H-43	49.93	40.98	51.01	47.31	1.922
3.	NS-H-45	46.57	51.55	51.46	49.86	1.671
4.	NS-H-111	48.87	51.98	51.33	50.73	2.027
5.	Velja	47.49	45.33	48.02	46.95	1.592
6.	Kraisnik	51.43	51.81	49.70	50.98	1.691
7.	Bacvanin	48.93	49.47	51.91	50.10	1.787
8.	Banacanin	47.76	51.65	49.96	49.79	1.863
9.	Labud	-	42.81	37.06	39.93	1.531
10.	Olivko	-	49.75	46.55	48.15	1.624
11.	Mirko	-	51.78	52.44	52.11	1.734
12.	NS-H-924	50.04	-	51.06	50.55	1.863
13.	NS-H-930	53.12	55.05	52.82	53.66	1.980
14.	NS-H-1300	50.95	-	52.17	51.56	1.807
15.	NS-H-1312	-	56.37	56.74	56.55	1.379

Conclusion

Regarding perennial examination of NS-hybrids of sunflower it was possible to conclude the following: there is a satisfactory climate, soil, and preconditions for sunflower production within the area of Bosnia and Herzegovina; a number of hybrids tested achieved yield of 3 t/ha; the results of tested hybrids with a different duration of growing period, it should be possible to produce sunflower in both flat and hilly areas; and the high genetic potential of tested hybrids could be achieved by proper selection of hybrid and through application of modern technology. In production technology, it is necessary to take care about quality and optimal timing of all technology measures, including soil cultivation, fertilizers, sowing, weed protection, and harvest.

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