

Santafe - an Excellent Sunflower Hybrid

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Abstract

Nowadays it is known the hybrids are better than varieties in sunflower production. All efforts are going to develop new and new hybrids with better characters. After Albena's boom in France, now Santafe appeared to be a new hybrid with very good potential yield, good oil content and one very important character - earliness, which classified this hybrid in group A of maturity. Hybrid Santafe entered in three years testing - 1993, 1994 and 1995 under the conditions of IWS (Northeast Bulgaria) and in State testing in competition with the supreme hybrids Albena and Super Start.

Seed yield, oil content, oil yield, height, head diameter, 1000 s weight and days to maturity of these three hybrids are compared and presented in tables. The presented results are for 1993 and 1994 testing because the data for 1995 testing is not ready yet.

Introduction

Sunflower is the main crop for vegetable oil in Republic of Bulgaria. In 1995 the commercial fields reached 500 000 ha. Ten years ago, cultivar Peredovik was mainly grown up, but now 60-70 % of areas are occupied by hybrids Albena and Super Start and only 30 % by Peredovik and edible cultivars. Hybrids have advantages in earliness, higher seed yield, higher oil content, resistance and tolerance to diseases and uniformity in front of cultivars.

Albena and Super Start are supreme hybrids, adapted to the conditions in Bulgaria, with specific characters, allowed to obtain stable seed and oil yield, combine with tolerance to diseases.

The aim of present study was to check the performance of Santafe under the conditions of Bulgaria.

Materials and Methods

The aim of the contemporary breeding programmes in sunflower is to develop more new parental lines (CMS and R) with better characters or to convert the old ones. These lines would have to be components of new hybrids which could be successfully compete the others included in the commercial lists all over the world. That's why there are three ways a new hybrid to be developed:

1. Combination of entirely new components (CMS line and R line).
2. Combination of well known component (CMS or R line) and new one (CMS or R line).
3. Combination of converted one or two components of well known hybrid (after transferring of specific genes).

Hybrid Santafe was developed by the second way. This hybrid is common hybrid between IWS and company Hillebrand - NK ,

France. Since 1992 Santafe took place in commercial list of France and in 1994 fields occupied with this hybrid were 100 000 ha (10 %).

Since 1993 hybrid Santafe is included in Bulgarian State Testing Programme and in IWS trials.

In 1993 and 1994 Santafe was tested in Representative Trials (RT), along with other pererspective hybrids. The check (standart) used was the average mean of hybrids Albena and Super Start.

The trial scheme was latin square, 20 entries in each trial, 4 replicates, 6 row replicate, row spacing - 0.7 m.

Oil content was read off by NMR analyzer "Newport".

The screening fot resistance to desease was carried out in laboratory and artificialy infested field.

Results and Discussion

In Bulgaria the conditions are not so favorable for planting sunflower - without irrigation, too drought or too wet summer, rely only on rainfalls and air humidity, instead of reach soil in some regions. The hybrids Albena and Super Start are the best adapted to these conditions. In some good years the seed yield of those hybrids rised up to 4000 kg/ha, which is probably the maximum.

Recently there are too many hybrids entered in State Testing, but with unstable performance through the years. Santafe is an exception because of specific characters it performed.

Seed yield

Average over two years, 1993-1994, Santafe got stability (102.3 %) on this character, exceeded 4 % Albena (tabl. 1).

Oil content/Oil yield

Santafe take advantage on one of the most important characters oil content, compared with Super Start almost equal, and better 1.5 % over Albena (tabl. 2)

In table 3. height, head diameter, 1000 s weight and days to maturity are presented. There are not great diferences in height and nead diameter among Santafe, Super Start and Albena, realy they are in one group. Concerning 1000 s weight, it is seen Santafe exceeded Super Start 9 g and Albena 7 g. Maturity is very important character, especially for countries with different climate conditions - Santafe is the most earliest hybrid(group A of maturity) in Bulgaria(the same in France).

Santafe was tested in laboratory on Orobanche and in artificialy infested field on Phomopsis and it was found out Santafe is resistant to Orobanche and tolerant to Phomopsis in some extent. Field observations during the testing showed resistance to lodging, no breaking of the head at harvesting, uniformity on the whole.

Conclusion

One of the most valuable characters Santafe presents - resistance to Orobanche and downy mildew(including the new race), tolerance to Phomopsis, resistance to lodging, gives the final draw of one hybrid, with excellent performance over those two years of testing, 1993 - 1994.

The results presented in this study showed Santafe is one very good adapted to the conditions of Bulgaria hybrid, which in the nearest future could successfully compete Albena and Super Start in the commercial production of sunflower.

References

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Table 1. Performance of hybrid Santafe, combined over years, 1993-1994, seed yield

Hybrid	1993		1994		1993-1994	
	kg/ha	% St	kg/ha	% St	kg/ha	% St
Santafe	2647	101.8	3001	102.7	2824	102.3
Super Start	2650	102.0	2953	101.4	2807	101.7
Albena	2547	98.0	2883	98.6	2715	98.3
Standart	2599	100.0	2923	100.0	2761	100.0

Table 2. Performance of hybrid Santafe, combined over years, 1993-1994 oil content, oil yield

Hybrid	1993		1994		1993-1994	
	Oil %	Oil yield kg/ha	Oil %	Oil yield kg/ha	Oil %	Oil yield kg/ha
Santafe	43.5	1151	45.9	1377	44.7	1264
Super Start	42.5	1126	45.2	1337	43.9	1231
Albena	41.9	1067	44.4	1281	43.2	1174
Standart	42.2	1098	44.8	1310	43.5	1204

Table 3. Performance of hybrid Santafe, combined over years, 1993-1994, height, head diameter, 1000 s weight, days to maturity

Hybrid	Height cm	Head diameter cm	1000 s weight G	Days to maturity
Santafe	147	18	57.9	114
Super Start	149	19	48.6	118
Albena	140	19	50.4	116