

EQUIPMENTS FOR SEED PRODUCTION FROM SUNFLOWER PARENTAL LINES WITH HIGH GENETIC PURITY.

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SUMMARY

The experience of the Institute of Wheat and Sunflower Dobroudja near General Toshevo, Bulgaria, is described in this paper in the superquality stock seeds production of sunflower parental lines. These equipments allow seed production with genetic purity close to 100 %.

The irrigation system built makes these independent of the environment and contributes to the production of the planned seed quantities.

Introduction

The onset of organized hybrid seed production in Bulgaria was founded in 1981. Superstock seeds from parental lines were produced under isolator as in all rest seed producing countries. The experience showed that that technique could not provide the seed amount production indispensable to satisfy the needs of the national seed production pattern in sunflower. Its shortcomings of importance are expressed in the following:

- 1) The technique is very expensive because of the need of tenth of thousands paper isolators which can be used only for one year.
- 2) Opportunities for pollination exist because of carelessness or tearing of isolators in bad meteorological conditions.
- 3) Necessity of a large assistant staff which we could not afford.

All these disadvantages made us to find another more sure ways to provide more seed production. Summarizing the foreign and local experience in 1982 we built 10 and in 1984 another 20 macro-isolator equipments with light constructions for seed production from sunflower parental lines.

MATERIALS AND METHOD

Each macroisolator is of metal construction, 64 m long, 8 m wi-

de, 3.5 m high in the vault arch and total area of 512 m<sup>2</sup>. As the planting interspace is 0.7 m, both the margins of the equipment are not planted at a distance of 1 m in order to be earthed up by a motor cultivator Mepol Tezza. The area for cultivation is 390 m<sup>2</sup>. The construction is covered by a plastic net with small holes protecting against bees and other insects. The planting pattern is the following:

o     o   o     o   o     o  
 + o   +   + o   +   + o

This pattern allows the application of a compulsory manual pollination by touching the heads from the maintainer row with the sterility of heads from the two adjacent rows of the line with cytoplasmic male sterility.

The seed quantity obtained is indicated in Table 1.

Table 1. Seed yield of line 1607 for the period 1985-1987.

Equip- ment No	No of plants		Yield - kg/ha		Yield - kg/ha	
	o	o	o	o	o	o
9	992	503	24.0	13.7	92.3	105.4
10	961	477	45.3	16.5	174.2	126.9
11	925	477	38.7	16.4	148.8	126.1
12	959	463	20.5	14.1	78.8	108.4
13	1023	484	25.1	16.0	96.5	123.1
14	961	431	29.6	13.2	113.8	101.5
15	906	431	31.4	13.7	120.7	105.4
average	961	466	30.6	14.8	117.7	113.8

The data show that regardless of the yield considerable variation of the single macroisolators which probably is due to soil fertility differences we have produced, at the average for the period of three years, 1177 kg/ha from the female line and 1138 kg/ha from the male line.

Except seeds from sunflower parental lines in these equipments small quantities of hybrid seeds could be also produced for the

different tests. The limited access of insects allows in one microisolator to be produced seeds of several lines without any risk of crosspollination.

The irrigation system built allows the production of sufficient quantities of superquality stock seeds to meet the seed production pattern in sunflower regardless of the years climatic conditions.

The only problem related to the sunflower monoculture growing is the disease multiplication and above all sclerotinia. The experience gained till now shows that this problem is solvable in keeping of certain phytosanitary control and mainly elimination of the diseased plants immediately after infection.

Besides, in building of equipments we have foreseen the possibility to transport these to new places, as the distance between the single microisolators is equal to their width.

The data of the seed quality during the six years' period gone show that their genetic purity is very close to 100 %.

#### Conclusion

These equipments proved to be very promising and gave us the opportunity in one extremely sunflower growing area, without risks, to produce annually the planned superquality stock seeds from the parental lines.

Besides, we succeeded to settle the problem to produce seeds with a very high genetic purity, a good premise for efficient hybrid seed production in sunflower.