# THE BEHAVIOUR OF CERTAIN SUNFLOWER HYBRIDS IN THE PRODUCTION CONDITIONS OF DOBROGEA

# COMPORTAREA UNOR HIBRIZI DE FLOAREA SOARELUI ÎN CONDIȚII DE PRODUCȚIE ÎN DOBROGEA

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***Abstract:*** *During the latest years, farmers have had to deal with a problem in Dobrogea: the presence of broomrape in the sunflower fields. The main causes of this phenomenon are the fact that rotation is not observed and the use of hybrids that do not resist to the attack of this parasite. Every year, specialists warn about the appearance of new broomrape varieties that are more and more resistant. The efficient pest control measures used previously prove to be useless against the most recent varieties. The paper observes the production behaviour of several sunflower hybrids recommended to be cultivated in Dobrogea, considering both the resistance to broom rape attack and a few productivity elements.*

***Rezumat:*** *În ultimii ani, pe teritoriul Dobrogei, fermierii se confruntă cu o problemă: apariția lupoaiei în lanurile de floarea soarelui. Nerespectarea rotației, dar şi folosirea de hibrizi nerezistenți la atacul acestui parazit, sunt principalele cauze ale fenomenului. An de an, specialiştii avertizează că apar rase noi de lupoaie, din ce în ce mai rezistente. Măsurile de combatere eficace la rasele din anii anteriori de dovedesc neeficiente la cele noi apărute. In lucrare s-a verificat comportarea în producție la câțiva hibrizi de floarea soarelui, recomandați să se cultive în Dobrogea, avându-se în vedere atât rezistența la atacul de lupoaie, cât şi câteva elemente de productivitate.*

***Key words*****:** *sunflower, broomrape, resistant hybrids, rotation.*
***Cuvinte cheie*****:** *floarea soarelui, lupoaie, hibrizi rezistenți, rotație.*

## INTRODUCTION

According to the data published in the Romanian Official Gazette, in 2004, out of the entire cultivated surface of the district of Constanța (429 155 ha), 118 406 ha were cultivated with sunflower, which represents 27,59%. Considering this aspect, the special interest for this plant in the area is understood. Given the conditions, it is also understood that the recommendation to cultivate sunflower on the same field once every 5-6 years cannot be followed. The only measure to counteract the broomrape attack would be to cultivate resistant hybrids.

The researches have been done in a production farm in the commune of Cumpăna, located close to the city of Constanța.

The main objective of the research was to verify the resistance of several sunflower hybrids (recommended for cultivation in Dobrogea) to the broom rape attack. [8]

## MATERIAL AND METHOD

Four sunflower hybrids were cultivated: Select, Coril, Beril şi Eladil.

The same cultivation technology was applied for each hybrid, that is, the classical sunflower cultivation technology. [7]

During the vegetation period there were observations regarding the emergence of broomrape in the sunflower field, as well as the resistance of plants to the attack of this parasite. No chemical treatments against broomrape were effected in the analyzed fields. The preceding plant was autumn wheat. Sunflower had been cultivated again on this field after 4 years. The number of broomrape plants occurred on the sunflower stems was recorded. Also, there were observations regarding the mass of one thousand grains (MMB), the hectoliter mass (MH), the number of fecundated seeds in the calathidium, the capitula diameter and the achieved production.

## RESULTS AND DISCUSSIONS

It is known that broomrape (Orobanche sp.) produces a great number of seeds, whose germination faculty is maintained up to 10-12 years, even 20 years, according to some authors. [2] As almost the entire territory of the district of Constanța is infested with the seeds of this parasite and as the economical demands unfortunately come before the environmental purity, solutions must be found to counteract this phenomenon. If the rotation recommended by specialists is not followed, that is, to cultivate sunflower on the same field after 4-6 years, according to the tolerance of the respective hybrid, the very existence of this culture is threatened in this area. That is why, the promotion of broomrape-resistant hybrids should be a permanent concern for specialists. [1]

Regarding the resistance to broomrape (table 1), out of all tested hybrids, Beril and Eladil were the most resistant to broomrape attack. Broomrape plant was signalled on the roots of these hybrids. Also, the greatest production was given by these hybrids.

The Coril hybrid was mildly resistant to broomrape, while the Select hybrid was infested by broomrape.

As for the achieved production (table 2), 17.82 q/ha were obtained in the Select hybrid, and 23.20 q/ha in the Coril hybrid. In production conditions around Cumpăna in the district of Constanța, the Eladil hybrid yielded 25.96 q/ha. The highest production among the 4 tested hybrids was given by the Beril hybrid (27.45 q/ha). Taking the Select hybrid as witness, it is observed that the Beril hybrid exceeds its production by 154.1 %.

*Table 1*

Broomrape resistance in several sunflower hybrids

| Hybrid | Broomrape resistance |
|---|---|
| SELECT | infested by broomrape |
| CORIL | mildly resistant |
| BERIL | resistant to broomrape |
| ELADIL | resistant to broomrape |

*Table 2*

The influence of the hybrid on the sunflower production

| Hybrid | Production | | Difference |
|---|---|---|---|
| | Q/ha | % | |
| SELECT | 17.82 | 100.0 | Mt |
| CORIL | 23.20 | 130.2 | 5.38 |
| BERIL | 27.45 | 154.1 | 9.63 |
| ELADIL | 25.96 | 145.7 | 8.14 |

By analyzing the data presented in table 3, it is observed that the highest value of the MMB was too recorded in the Beril hybrid (103 g), followed by the Coril hybrid (96 g). The smallest value of the MMB among the analyzed hybrids was obtained in the Eladil hybrid (88 g).

Table 3 also presents the results regarding the hectoliter mass (MH) in the 4 studied sunflower hybrids. The higher MH value is recorded in the Eladil hybrid (38 kg) and the smallest in the Select hybrid (35.5 kg).

The average number of fertile seeds in the capitulum represents a productivity element. The measurements effected in the four studied sunflower hybrids led to the following results presented in table 4: the highest number of fertile seeds was recorded in the Eladil hybrid (5705 fertile seeds/capitulum). The Coril hybrid gave similar values (5200 fertile seeds/capitulum). This hybrid also registered the highest number of dry seeds (985). (Table 4)

The results obtained regarding the average diameter of the capitula are presented in table 5. The hybrid with the biggest capitulum diameter proved to be Eladil (17 cm). The other 3 analyzed hybrids present similar values (Beril – 14.5 cm; Eladil – 14.8 cm; Coril – 15.3 cm).

*Table 3*

The MMB (the mass of a thousand grains) and the MH (the hectoliter mass)

| Hybrid | MMB (the mass of a thousand grains) | MH (the hectoliter mass) |
|---|---|---|
| SELECT | 90 | 35.5 |
| CORIL | 96 | 36.3 |
| BERIL | 103 | 36.2 |
| ELADIL | 88 | 38 |

*Table 4*

The average number of seeds in the capitulum (fecundated and not fecundated)

| Hybrid | number of seeds in the capitulum fecundated | number of seeds in the capitulum unfecundated |
|---|---|---|
| SELECT | 3300 | 985 |
| CORIL | 5200 | 530 |
| BERIL | 3620 | 630 |
| ELADIL | 5705 | 740 |

*Table 5*

The average diameter of the sunflower capitula

| Hybrid | Average |
|---|---|
| SELECT | 14.8 |
| CORIL | 15.3 |
| BERIL | 14.5 |
| ELADIL | 17 |

In what regards the number of fecundated seeds in the calathidium, the greatest values were obtained in the Eladil hybrids (5705 fecundated seeds in the calathidium), followed by the Coril (5200 fecundated seeds in the calathidium). The fewest fecundated seeds were registered

in the Select hybrid (3300). The Beril hybrid had the highest MMB values (103 g), while the Eladil hybrid presented the lowest value (88 g).

The hectoliter mass generally had close values in all hybrids.

## CONCLUSIONS

Among the studied hybrids, the most productive one proved to be the Beril, in which the production was 27.45 q/ha, exceeding that of the Select hybrid (9.63 q/ha). We must specify though, that these productions were obtained without irrigation.

The best tolerance to broomrape attack was shown by the Beril and Eladil hybrids, as no plant affected by broomrape was found on the entire field covered with these hybrids. The Coril hybrid had an average resistance to broomrape, while the Select hybrid had the lowest resistance.

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