

A new potential for fight against sunflower stem diseases

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(Poster demonstration illustrated with 27 colour photos)

INTRODUCTION

There were no antecedents of this experimental work. It appears as a new potential of complex genetic protection by use of a macromutant denominated "BO" (FSZ-10) against stem diseases caused by *Sclerotinia sclerotiorum* (LIBERT) de Bary (syn.: *S. libertiana* FUECKEL), *Diaporthe helianthi* MUNTANOLA-CVETKOVIC et. al. and *Macrophomina phaseolina* (TASSI) GOIDANICH /syn.: *M. phaseolina* (MAUBLANC) ASHBY/ pathogenic fungi.

Discovery of mutant: 1984

Place: Cereal Research Institute, Szeged, Hungary

MATERIAL and METHODS

Characterization of the macromutant "BO"

Morphological traits

Negative teratological alterations

1. Irregular leaf position
2. Strongly flattened fasciated stem
3. Distorted inflorescence
4. Extremely poor pollen production

Agronomical characters

1. Good combining ability for achene yield and oil content
2. Strong tolerance to stem diseases

Other characteristics

1. Leaf number up to 100-200/plant
2. Small leaf size
3. Normal shape of disc florets and achenes

QUESTIONS RAISED and GOAL OF THE WORK

1. May the teratological morphology of this mutant be stabilized?
2. What is the genetic determination of these traits?
3. How the mutant might be used in hybridization?

RESULTS

1. The particular morphology of the mutant "BO" is stabilized and this genetic material can be used as a line.
2. The mutant "BO" has a little (or no) perspective to be utilized as *cms* female line because of the teratological distortion of its head since the female line is the main base for economical F_1 seed production.
3. The mutant "BO" may be used as male restorer line: branching multiheaded forms have been selected. These types have a completely normal morphology of their lateral heads and abundant pollen production.
4. By crossing of several *cms* A lines with a large number of "BO" multiheaded forms it has been proved that the resulting F_1 hybrid populations were uniform both for morphology and fertility restoration.

On the other hand, in the backcross progeny of

(*cms* A x BO) x BO the following ratio of segregation was observed:

50% BO-type plants : 50% normal one-headed plants.

CONCLUSIONS

1. New particular morphological traits characteristic for the mutant "B0" are determined by a single recessive gene. Thus, this is a typical phenomenon of pleiotropy.
2. This morphology may be used for distinction in the line/variety protection.
3. It has been proved that this morphology has a recessive determination in F_1 hybrids. Like to trait of branching it is present in "hidden" state. In consequence, F_1 sunflower plants consist of normal one-headed uniform plants.
4. Using this particular morphology of mutant "B0" male restorer parental line(s) can be developed in the way that tolerance to stem diseases in hybrid combination(s) fairly appears.