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METHODS FOR DEVELOPING HYBRID SUNFLOWER INVOLVING CHEMICAL CASTRATION (1)

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One of the methods for obtaining a large quantity of fully hybrid seeds might be the use of forms with male sterility.

Hereditary conditioned forms of male sterility, cytoplasmic and gene, both have their own advantages but need a big preliminary and complicated breeding work. With cytoplasmic male sterility it is required to develop a large amount of sterile analogous and fertility restoring lines, as to gene forms - a tight contact with a marker gene and a tiresome work in the field for eliminating the fertile plants.

A much more rapid, cheaper and simpler method is the use of modificated sterility.

Suitable treatment of the sunflower plants with gibberellin allows to obtain 100 % male sterility from practically all forms of H. annuus L., and permits widely the use of hybridization.

Best results (100 % male sterility, with a small decrease, not over 15 %, in yield) were obtained after treating the plants in the initial anthodium stage of development, at -20 -22°C air temperature. For variety-populations the concentration of the gibberellin solution was 0.005 %, the dose for 1 plant - 10 ml, and 40 g for 1 hectare. The expenditure of gibberellin should be decreased by 15-20 % if lines are used.

Medium-late planting is desirable, so as the development of the anthodium would begin at the hot summer period - middle of June. Treatment of the plants with gibberellin not only induced male sterility but also induced several morphological characters, the most important of which is the decrease in the diameter of the anthodium and the number of flowers in it. The rate of reduction mainly depends on the dose and usually is not higher than 10-15 %.

To reduce this negative occurrence the mother forms are recommended to be close-planted by 25-30 %,

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(1) Le texte complet de cette conférence ne nous étant pas parvenu nous éditons ici le résumé.

i.e. 55-60 thousand plants per hectare. It should be kept in mind that flowering of gibberellin treated mother forms starts 4-6 days earlier than usual, and proceeds simultaneously.

For commercial planting the scheme 2:2 or 4:2 may be used.

The weight of 1 000 seeds decreased by 15-25 % but the emergence of those seeds was 100 %. Sowing of hybrid seeds should be made at 5-6 cm depth, into a well prepared soil.