

## APPLICATION OF METHOD OF BIOTECHNOLOGY IN SUNFLOWER BREEDING

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The application of method of biotechnology in agriculture marks a new epoch in plant breeding. The practical side of application should enable the creation of productive varieties and hybrids possible.

Present experiments are directed towards the creation of varieties and hybrids resistant to disease and insects by the introduction of genes of wild relatives. Then, they aim at high tolerance to the wide spectrum of herbicides, stress (draught, high and low temperatures) etc. Bioengineering should enable the increase of genetic variability in cultural crops and speedy achievement of desired aim. New breeding cannot completely replace conventional breeding methods, but only accelerate and facilitate the realization of breeding programme.

The aim of this work is to show the possibilities of application of the method of biotechnology in sunflower breeding on the basis of the initial results in world and our country.

It is well-known how narrow genetic variability of cultural sunflower may be and how deficient in genes which condition the resistance to diseases and insects it is.

The fact is that cultural sunflower has a great number of wild relatives and that by using them in breeding, its genetic variability may increase and be enriched by genes which condition resistance to diseases. Genus *Helianthus* has 50 wild sunflower species and a great number of populations in each species which should be included in selection process by the modern methods.

Since the plenty of wild species in genus *Helianthus* may not be fully used by the application of standard methods of selection in combination with biotechnology methods, it is possible to achieve better results in sunflower breeding, especially in interspecies hybridization were achieved by the use of embryonic cultures methods, which enable the transfer of desirable genes from wild species where postfertilization incompatibility leads to embryo/endosperm degeneration.

Dihaploid breeding of the basis of anther culture in sunflower is very important. The main interest and profit of dihaploid breeding is speedy obtaining of homozygous lines, which enables the shortening of selection cycle. In interspecies hybridization and backcrossing, the application of anther culture is very important for acceleration of homozygous sunflower lines with different properties and fuller application of new genetic variability.

The creation of in vitro haploids by the use of anther/pollen culture helps in creation of homozygous lines in very short period, but this method is still inapplicable in sunflower, because of insufficient knowledge of the specific medium for regeneration of plant from the callus. However, it should be noted that some authors (Gunda, 1984, Alissa et al., 1984) first succeeded in creation of haploid plants in interspecies hybrids of sunflower.

In tissue culture laboratory at the Institute of Field and Vegetable Crops in Novi Sad, the plant was obtained by the regeneration of anther callus. However, wider application of anther culture in sunflower breeding has still not found the practical application in other plant species.

The use of micropropagation in sunflower selection has high significance. Sunflower is adequate for plant species in micropropagation application which could be commercially used for fast propagation of hybrid combinations and selected CMS sunflower lines.