



TECHNOLOGY FOR OBTAINING HETEROTIC HYBRIDS OF CORN UNDER PRODUCTION CONDITIONS

SAIDOV MUXAMADI

Associate Professor of the Department of Ecology and Soil Science,
Termez State University.

zokirov97@umail.uz

Article history:	Abstract:
Received: 11 th February 2021 Accepted: 28 th February 2021 Published: 18 ^h March 2021	The article is discusses the technology for obtaining heterotic hybrids of corn under production conditions. Heterosis manifests itself in the first generation and decreases in subsequent generations. The purpose of obtaining heterotic hybrids is to obtain seeds of the first generation
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1. THE CONCEPT OF HETEROSIS AND ITS MEANING

An increase in the vitality and power of the first generation (F1) in relation to the parental forms (P) is called heterosis. There are three types of heterosis:

- reproductive - grain yield increases,
- somatic - vegetative organs change,
- adaptive - increased resistance to external conditions.

heterosis manifests itself in the first generation and decreases in subsequent generations. The purpose of obtaining heterotic hybrids is to obtain seeds of the first generation.

When heterotic seeds of the first generation are graying, the yield increases from 35 to 50% relative to the parental forms.

The practical use of the effectiveness of heterosis is one of the worldwide achievements of genetics and breeding. The number of plants that are applied for heterotic generations is increasing.

Especially in the cultivation of corn, sorghum, sugar beet and other crops, it is effectively used against heterosis; in field lands, when using the correct agricultural technology, a higher yield and economic profit are obtained.

2. HISTORY OF THE DISCOVERY OF HETEROSIS.

The manifestation of high traits in a hybrid in relation to parental forms was first explained by a member of the St. Petersburg Academy from Germany and Kelreiter. In 1760, he crossed some types of shag and tobacco with each other and got an interspecific hybrid. Later, on the part of Charles Darwin, the state of stability of hybrids was studied and the results were published in 1876 in his work "The influence of cross-pollination and self-pollination on the plant world".

Based on the teachings of Darwin, American scientist D. Beal in 1878, by crossing corn varieties with each other, achieved high-yielding hybrids and declared an increase in yield by 10% and it was known the difficulty of obtaining high yields by selection [1].

3. APPLICATION OF THE INSPIRATION METHOD TO ACHIEVE HETEROSIS.

In the breeding of corn scientists of America, D.G. Shel in 1904 first used the method of instillation and, in order to obtain a clean line, used self-pollination.

(Inbreeding and inbreeding denotes a sign of decrease, deterioration, inbreeding inherent in plants, inbreeding - for animals)

Corn is cross-pollinating plants, when using insult, the corn yield decreases twice according to the following scheme:

	Heterozygous in%	Homozygote in%
F ₁	100	0
F ₂	50	50
F ₃	25	75
F ₄	12.5	87.5
F ₅	6.3	93.7
F ₆	3.1	96.6
F ₇	1.6	98
F ₈	0	100

Thus, the American scientist D.G. Walked in 1904 called the increase in power in the first generation heterosis. When using instillation, the first generation (F₁) is obtained from the maternal forms, for this the maternal form is castrated, the paternal pollutants directly enter the maternal flowers. At the same time, a powerful heterotic process occurs in the self-pollination of pure lines, due to which many indicators can change up to 50% and will give a positive effect compared to parental forum.

4. EFFICIENCY OF HETEROSIS IN THE FIRST AND SUBSEQUENT GENERATIONS.

Heterotic hybrids by comparing the parental forms give a high yield only in the first (F₁) generation, the next 2.3 years decreased, and in 4-5 years it is equal to the parental forms.

In obtaining heterotic hybrids, crossing pure lines is of two kinds:

1. Removal of the paternal panicle of the maternal form, pollination only with the paternal pollinator.
2. Sow maternal form TSMS (Cytoplasmic male sterility) [2].

5. OPENING OF TS.M.S. NEAR CORN.

In the first Ts.M.S. used in 1931 by M. Rhodson and in 1932 by M. Khadzhinovnaya friend-friend. Maize has 2 types of Ts.M.S.

1. Texan type - used 10%
2. Moldovan type - 90% used.

Carrying out the work of crossings without castration of the paternal panicle of the maternal form using Ts.M.S. first written by the scientist M. Khadzhinov. However, it was applied in practice in 1943 by scientists Jones and Clark.

G. Galeev in 1953, M. Khadzhinov in 1954 and applied in Russia.

Cross signs:

P - parent form

♀ - maternal form (mirror of venus)

♂ - paternal form (shit and sword of mars)

X - crossover

F – generation F₁, F₂, F₃.

6. OBTAINING THE FIRST GENERATION (F₁) OF CORN HETEROSIS UNDER PRODUCTION CONDITIONS

For this, work is being carried out to prepare land for sowing, after completing arable land, in early spring, leveling and harrowing. After that, the paternal and maternal lines are sown with the svkh-4 seeder.

The seeds of the paternal line are placed in one extreme box of the seeder, in the remaining 3 boxes the seeds of the maternal line. At the same time, 2 rows of paternal lines grow in the fields, and maternal lines in six rows.

Paternal and maternal crops are harvested separately. Here, the harvest of the paternal line is derived from its own line, and the harvest of the maternal line is considered a heterotic hybrid.

Unmixed maternal and maternal ear yields are calculated separately.

Seeds of heterotic hybrids remain on the cobs for up to 3-4 months, after full maturity, the seeds are separated from the cobs, after which they are handed over to the organization for grain procurement. These organizations distribute seeds to farms for sowing. These farms, in turn, get a high yield from sowing first-generation hybrids.

Vir - 338 belongs to such a high-yielding heterotic hybrid, which was bred by crossing the "Spring" maternal line with the "Wind" paternal line [3].



P ♀ Spring



Wind ♂



Maternal form



Generation F1 Heterotic
Hybrid



Paternal form



Maternal line

Generation F1 Heterotic

Paternal line

Hybrid

LIST OF USED LITERATURE

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