

ORGANIZATION OF THE BREEDING PROCESS AS A MEANS OF INCREASING THE EFFICIENCY OF BREEDING HETEROSIS F₁ TOMATO HYBRIDS

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Abstract

The article presents the results of a comprehensive approach to research using mutant tomato genotypes as source material and combining classical breeding methods with gametic technologies. It provides a description of F₁ tomato hybrids (10 combinations) obtained by crossing cultivated lines with mutant lines that carry marker genes (*sp*⁺, *sp*[±], *rin*, *nor*, *alc*, *u*, *ls*, *br*, *β*, *gs*, *Wo*^m, *j-2*, and others) of high economic value. These are high-tech, heterotic F₁ tomato hybrids with yields ranging from 27.8 kg/m² to 36.5 kg/m² and a marketability of fruits from 89.1% to 95.6%. They are indeterminate (*sp*⁺) and semi-determinate (*sp*[±]) in growth type, with large (120...250 g) brightly colored fruits of red, pink, and orange. The high content of dry matter (5.2...6.8%), sugar (4.2...5.5%), and vitamin C (29.0...47.4 mg/%) provides high taste qualities to the fruits. A differential reaction of F₁ tomato hybrid pollen to high and low temperatures tested *in vitro* has been demonstrated. The results obtained indicate the effectiveness of heterosis breeding using complementary methods with simultaneous assessment of morpho-biological, economically valuable traits, and resistance to various temperature stress factors. This has made it possible to create F₁ tomato hybrids capable of realizing their genetically determined productivity potential in climatic conditions that are far from optimal, and to recommend them for cultivation in industrial greenhouses in the Republic of Moldova.

Keywords: tomato, breeding, methods, F₁ heterotic hybrids, economically valuable traits