

COLD RESISTANCE OF TOMATO

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Introductions. The development of cold-resistant tomato varieties and hybrids allows to accelerate the production of early crops and extend the period of growing plants in the open field. Cold tolerance is the ability of plants to withstand prolonged low positive temperatures from 0⁰ to 10⁰ C. Different plants withstand low temperatures in different ways. Heat-loving crops, such as tomato, are damaged already at low positive temperatures. The main problems are metabolic disorders and the structure of the protoplasm, and the accumulation of toxic substances. Externally, this is manifested in the loss of turgor – the roots after cooling largely lose their ability to absorb moisture, while evaporation through the stomata on the leaf apparatus continues, and the color changes due to the destruction of chlorophyll. However, in many cases, the damage does not cause external manifestations and the plants die, but look healthy enough from the outside.

Aim. The cold tolerance trait in tomato varies considerably and is based on the general physiological and biochemical characteristics under these conditions. More cold-resistant forms resume growth processes faster than unstable ones, which makes it possible to adapt to low-temperature stress. Therefore, the aim of the work was to determine the level of adaptation of tomato plants to low-temperature stress.

Materials and methods. To assess cold tolerance, we treated the seeds with low temperatures from 0 to 16 °C. Wet tomato seeds were kept at variable

temperatures in a refrigerator until germination and the percentage of germinated seeds, growth rate at variable temperatures were determined – 12 hours at 0 °C and 12 hours at 16 °C. Also, the rate of growth recovery after exposure to stressful low temperatures.

Results and discussion. A high percentage of seed germination under the influence of stressful temperatures was observed in the Prelude variety and the DU 79 line. In terms of growth rate under cold stress, the Red cherry variety, created on the basis of wild tomato varieties, was characterized by high rates. Compared to other varieties of the collection, Novinka Pridnestrovia, Red cherry and line DU 79 quickly recovered growth after cold stress.

Conclusions. Resistance to cold stress manifests itself differently in different varieties and is probably controlled by several genes.