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Economic and Biological Characteristics of Tomato Varieties, Hybrids When Growing in Film Unheated Greenhouses

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Annotation: This article presents the results of testing a collection of tomatoes of foreign and local selection in film unheated greenhouses. Testing of tomato varieties in film greenhouses showed that many promising samples are a valuable source material for creating early-ripening, highly productive and high-tasting disease-resistant tomato fruits.

Key words: Film greenhouses, varieties, hybrids, tomatoes, seeds, seedlings, fruits, selection, disease resistance, quality, yield.

Introduction

Modern industrial greenhouse vegetable growing makes high demands on varieties and hybrids of tomato. Breeding programs should provide for obtaining varieties and heterotic hybrids for specific conditions and cultivation purposes [6].

The conservation of biological diversity, the reproduction of plant resources, the creation and expansion of the range of domestic varieties and hybrids of vegetable crops are a priority for ensuring the country's food independence. Today it is necessary to pay attention not only to food security as such, but also to the nutritional value and safety of vegetable products produced. Diversification of vegetable growing is necessary. At the same time, the development and expansion of genetic diversity, and the expansion of selection and seed production in vegetable growing are of particular importance [3, 5, 9].

Breeding and use in the production of specialized varieties and heterotic hybrids is the main way to improve the quality and productivity of products. There are quite a lot of vitamins in tomatoes; for example, B1 - up to 12 mg (hereinafter in mg per 100 g of fresh weight of tomato fruits), vitamin B 3 - up to 7 mg, carotene (provitamin A) - 2 mg, vitamin C - up to 25 mg. The content of ascorbic acid (vitamin C) increases as the lighting conditions improve during fruit growth and ripening [1, 7].

In breeding, there are concepts of direct and inverse genetic dependence. For the sake of high productivity and excellent presentation, we sacrifice taste qualities, such as taste and smell, and this is one of the main indicators for vegetable products. It is not for nothing that the need for environmentally friendly products has recently increased all over the world, including vegetables [9, 10].

The requirements for tomato varieties in protected ground are much higher than in open ground. They must have high disease resistance and productivity when grown under adverse conditions - with a lack of light and heat, high relative humidity, and sudden changes in temperature. The fruits of these varieties and hybrids must be of high quality both in appearance and biological value [2, 4].

In greenhouses, tomato culture in one place is very long, and the conditions contribute to the development of a number of diseases. At the same time, high yields are provided by genetic resistance to the main tomato diseases that are often found in greenhouses - tobacco mosaic virus (TMV), brown leaf spot, fusarium wilt, gray mold, etc [8, 9].

Research methodology

The laying of a collection nursery and research were carried out according to the Guidelines for the selection of varieties and hybrids of vegetable crops for open and protected ground. All-Russian Research Institute of Selection and Seed Production of Vegetable Crops. M. 1997.

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Research results

The main task in tomato breeding for unheated film greenhouses is to create varieties and hybrids that combine high yield and good fruit quality with complex disease resistance, new varieties and hybrids must meet the requirements of modern technology and be flexible, so that their cultivation would be at minimal cost was the most efficient.

Testing of foreign variety samples in protected ground showed that they are a valuable source material for various areas of breeding.

In the future, work with the tomato collection will be aimed at mobilizing and studying everything valuable, as well as searching for sources and factors of the most valuable economic traits, and creating new varieties and hybrids that meet modern requirements.

Winter - spring turnover in the greenhouses of Uzbekistan is the main one. The productivity of the plant in this growing period increases significantly due to meteorological conditions, which are expressed in an ever-increasing amount of heat and light of the main factors of plant life. This turnover is especially favorable for tomato.

For this purpose, we tested the collection material in the winter-spring circulation.

Sowing seeds in cassettes for this turnover on January 5, planting 50-60 day old seedlings in the first decade of March with drip irrigation, the end of the culture at the end of July.

Tables 1 and 2 show data on phenology, growth and development of tomato varieties in winter-spring turnover. Differences between varieties and hybrids were observed already in the early phases of growth and development.

So, the appearance of the first true leaf in F1 Subhidam, Cherry Marvarid, Umid, Amber, L - 20 - 20, AVE - Maria, Balcony, Dilecates F1, Artist F1, Atoll F1, Alaska F1, was noted on 8-9 days, in the rest variety samples for 10-11 days, mass flowering of the first inflorescence in cherry Marvarid, Yantarny, Umid, L - 20 - 20, Subhidam F1, AVE - Maria, Atolla F1, Amulet F1, Elite F1, Alaska F1, noted on 46 - 54 days , in the rest of the variety samples for 60 - 64 days.

Varieties and hybrids differed from each other in growth and development, so, on the -120th day from mass shoots (10.05), Cherry Marvarid plants had a greater height of the main stem - 180 cm, Cherry Amber - 185 cm, Cherry Umid - 171 cm, the smallest was noted in Minion F1 - 46 cm, Gulkand standard - 125 cm, the rest of the varieties had an intermediate height of the main stem. Umid cherry, Marvarid cherry, Amber cherry from 112 - 125 pieces had the largest number of fruits; large-fruited U L - 20 - 20 -55 pieces, F1 Turon - 39 pieces, and AVE - Maria - 32 pieces, the smallest was noted in Altaev - 7 pieces, the Gulkand standard has 25 pieces

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Table 1

The passage of phases and the development of varieties, hybrids of tomatoes in the winter - spring turnover (2020-2021)

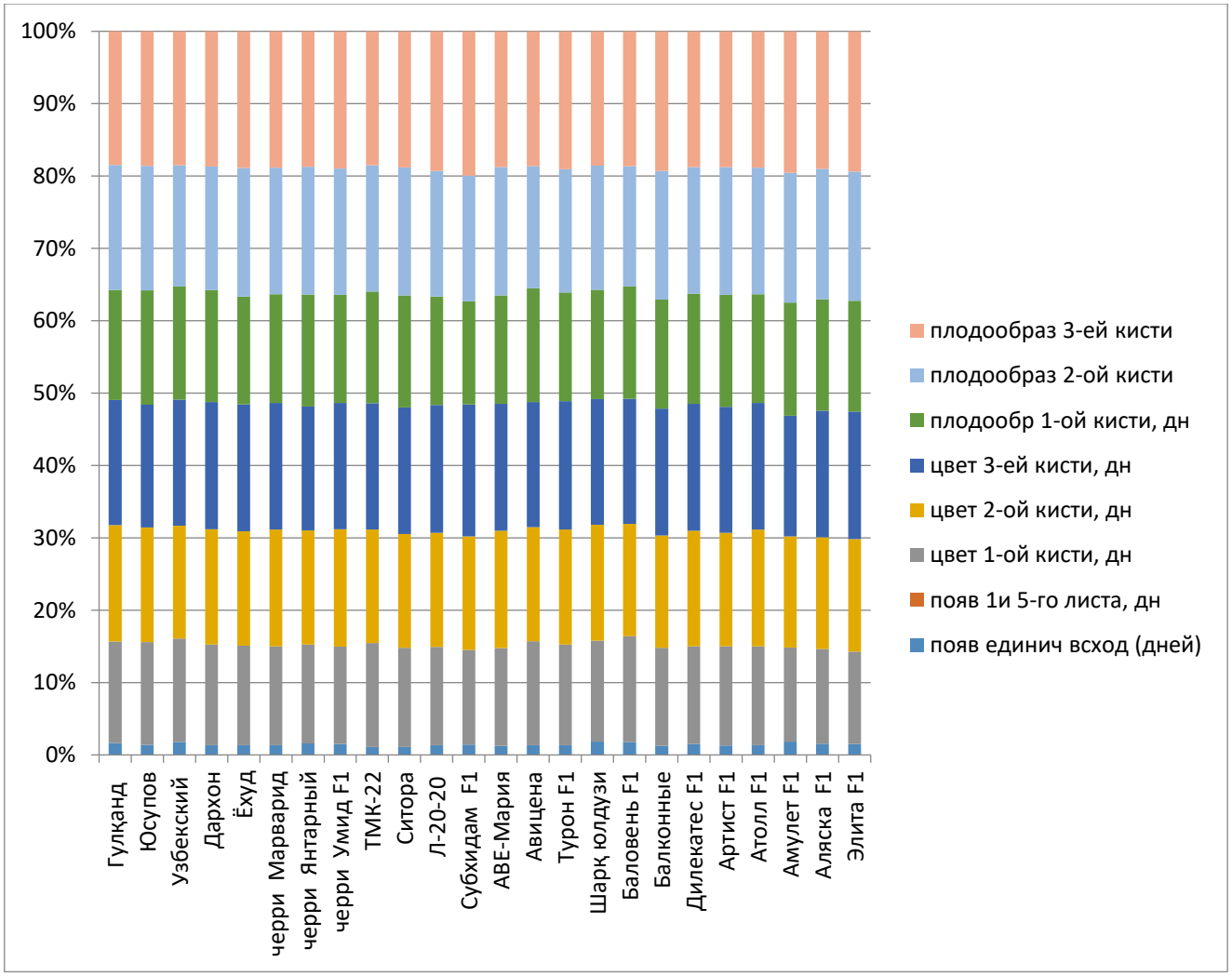

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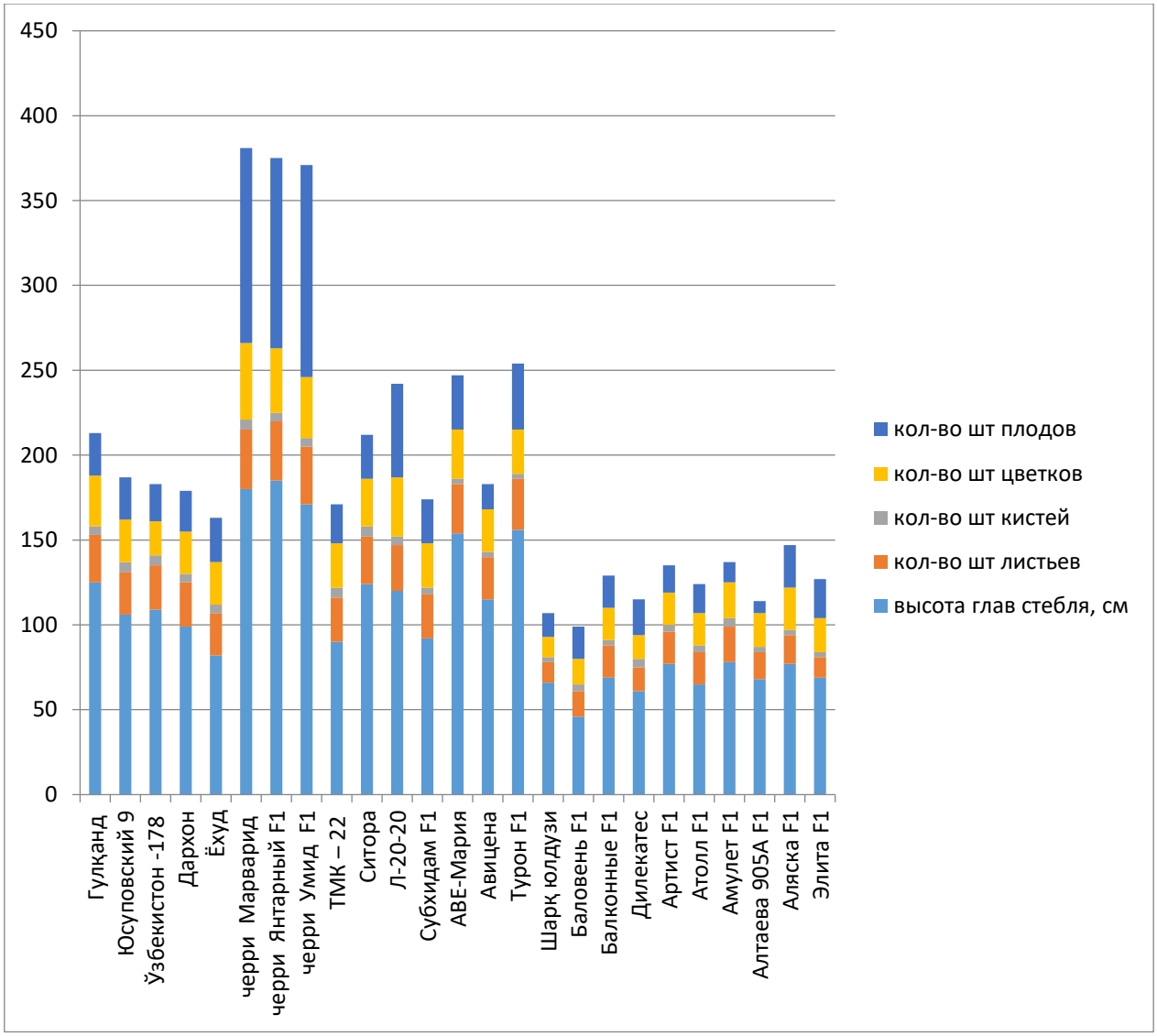
Table 2.
Growth and development indicators of promising varieties, tomato hybrids in winter - spring turnover (on the 120th day from mass shoots) (2020 - 2021)



There is a significant difference in productivity between varieties (Table 3).

A higher yield was obtained for the following varieties: Umid cherry - 14.8 kg/m2, Amber cherry - 13.5 kg/m2, Marvarid cherry - 12.1 kg/m2, F1 Turon - 12.4 kg/m2, AVE- Maria - 10.6 kg/m2, L - 20-20 - 10.1 kg/m2, the smallest was noted in Altaev 905A - 4.2 kg/m2, in the Gulkand standard - 9.1 kg/m2, the rest had intermediate. According to the average weight of the fruit, Yusupovskiy 9-220 grams stood out, the smallest average weight of fruits was noted in cherry Marvarid, Yantarny and Umid from 25-40 grams, in the Gulkand standard -150 grams.

According to the biochemical composition of the fruits, the following varieties were distinguished: L - 20 - 20, ABE - Maria, F1 Turon and also the Gulkand standard, according to the accumulation of nitrate nitrogen in fruits, it was below the MPC in all tomato samples and ranged from 105 - 120 kg/m^2

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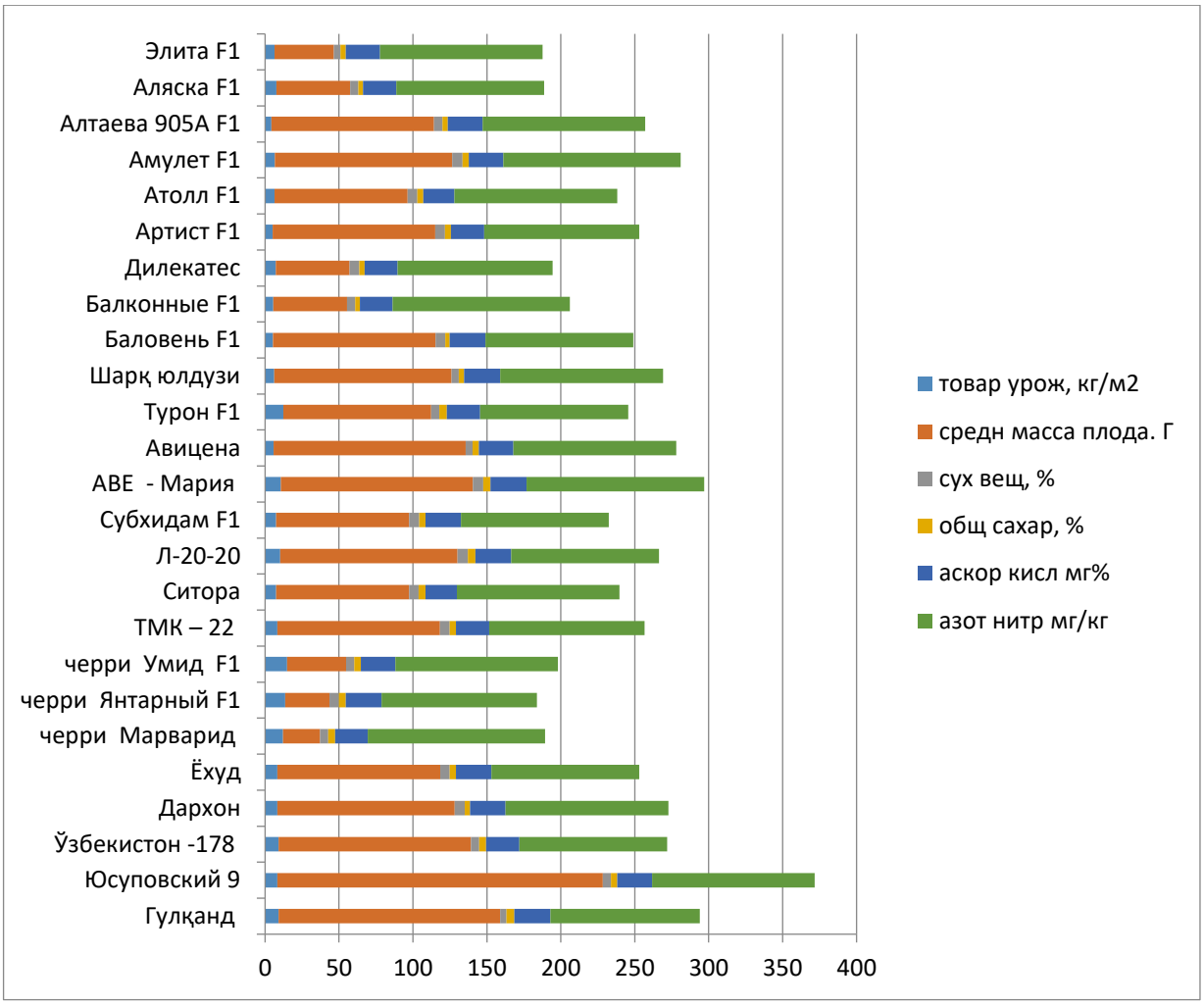
Table 3

Productivity and quality of tomato varieties in winter-spring turnover in film unheated greenhouses



Conclusions

Thus, in film unheated greenhouses, it is possible to grow such variety samples as cherry Marvarid, Umid, Yantarny, AVE - Maria, Turon F1, L - 20 - 20, Uzbekiston - 178, TMK-22, Yusupovsky, Yohud, Subhidam resistant to diseases and adverse conditions microclimate.

Of great importance is the ability of a variety or hybrid to set fruits at elevated temperatures, which in our conditions are already observed in April. In this connection, these variety samples ABE - Maria, Subhidam, Yohud, F1 Turon, TMK - 22, L - 20 - 20, these variety samples will be used in the future as starting materials in breeding.

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