DEVELOPMENT OF TECHNOLOGICAL ELEMENTS OF CULTIVATION OF SAMPLES OF COCKTAIL-TYPE VARIETIES OF TOMATOES IN UNHEATED GREENHOUSES (IN WINTER-SPRING ROTATION)

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Abstract. *The article presents the study of the technological elements of the cultivation of cocktail-type varieties of tomatoes in unheated greenhouses in the territory of Uzbekistan, as well as information about the origin of cocktail-type varieties of tomatoes, the passage of phenological phases and productivity of cocktail-type varieties of tomatoes. The study of the technology of cultivation of cocktail-type varieties of tomatoes in unheated greenhouses and the description of promising varieties are given in the territory of Uzbekistan.*

Keywords: *varieties, productivity, fruit, soil and climatic conditions, unheated greenhouses, type, tomato, cocktail type.*

INTRODUCTION

The role and importance of agriculture in ensuring the safety of food, in particular, the type and quality of vegetable crops, is increasing day by day. In particular, in our country, it is an urgent issue to provide the population with agricultural products, increase productivity and interest, and introduce scientific achievements and modern approaches to the field, using the available resources and opportunities wisely. Since vegetable crops are considered to be extremely rich in biologically active substances, vitamins, enzymes, and mineral salts necessary for human health and work capacity, great attention is being paid to increase their cultivation in our republic. . In this regard, protected land vegetable growing is one of the main branches of agriculture, and it is important to provide the population with products rich in new vitamins in the off-season. Currently, tomatoes, cucumbers, citrus and other vegetable crops are grown in greenhouses in Uzbekistan.

Tomato is one of the leading vegetable crops today. Tomatoes are popular among vegetable crops due to their delicious taste, color and shape, as well as various canned and pickled products, tomato pastes, juices, ketchup, salads and many national dishes. The fruits of each variety or hybrid have their own shape, size, density, color, brightness, chemical composition, aroma and taste. Most of these characteristics may vary depending on the characteristics of the variety and the technology of their cultivation.

Tomato fruits contain 94-95% water, and the mass fraction of dry matter usually varies between 4.5-5.7%. The main share is from sugars (2.5-3.5% of raw materials), which are represented mainly by glucose, to a lesser extent by fructose and sucrose. The percentage of polysaccharides (starch, dextrins, fibers) is 0.84%. A small amount of starch remains in ripe fruits, and more in unripe fruits. The main part of pectin substances (soluble and insoluble pectins, pectic acid) is located in the placental layer of cells, their share is 0.13%. Soluble pectins react with

calcium, which increases the density of fetal tissues and increases their mechanical strength. Pectic acid accumulates in large quantities in overripe tomatoes.

The creation of cocktail varieties and hybrids of tomatoes is a new direction in the selection, which differ from other types and varieties by the size and color of their fruit. In Uzbekistan, the main direction of choosing vegetable crops in greenhouse conditions is high yield of fruits, good taste, large, medium and small fruits. The taste qualities of tomato fruits directly depend on the ratio of soluble substances, fructose, citric acid, soluble substances and titratable acid in them, the most accurate assessment of this quality is possible only by tasting.

Because the density of the shell of cocktail tomatoes and the shelf life of the fruits have not changed, they can be removed after waiting for the ripening of all the tomatoes in the brush (the whole bunch at the same time), not after the first one or two fruits have ripened. These tomatoes are resistant to cracking, but cracking may occur if they are not watered for a long time and then watered heavily.

Cocktail tomatoes can come in a variety of shapes from round to plum and pear-shaped, and the color of the fruit is amazing for its variety and brightness - red, orange, yellow, brown and even watermelon, the characteristic feature is that they are dense have leather, which makes them easy to transport and store. It is very important for fresh greenhouse tomatoes to have a beautiful color, uniform ripening, high sugar content, vitamins and good taste.

A very important positive quality of these tomatoes is that they have a high fruit set in the characteristic high temperatures of recent years, resist cracking and shedding of fruits and remain in the brushes for a long time. They can be collected as whole brushes, as well as individual fruits. Tomato cocktail varieties are very resistant to diseases (TMV, brown leaf spot and gray rot of fruits).

However, the selection of "cocktail" varieties of tomatoes and the development of technological elements of cultivation in greenhouse conditions of the republic is an urgent problem. Therefore, it is necessary to research the development of technological elements of the cultivation of tomato cocktail-type samples in the autumn-winter cycle in greenhouses.

In this regard, PF-4947 of the President of the Republic of Uzbekistan dated February 7, 2017 "On the strategy of actions for the further development of the Republic of Uzbekistan", June 17, 2019 "On land and water resources in agriculture PF-5742 on effective use measures" and PF-5742 dated October 23, 2019 "On approval of the strategy of agricultural development of the Republic of Uzbekistan for 2020-2030" In Decree No. 5853, one of the important tasks is "...to ensure the safety of food products and improve the consumption ration, to develop and implement a food safety state policy that provides for the production of the required amount of food products" defined.

In order to provide the population with fresh fruits and vegetables year-round in Uzbekistan, tomatoes are grown in heated and unheated greenhouses in 3 seasons: autumn-winter (from the beginning of August to January of the following year), winter-spring (from January to July from the end of the month) and long-term (from August to July of the following year).

In many countries of the world, extensive scientific and research work on the introduction, selection and seeding of vegetable crops, as well as the research of cultivation technology V.F. Pivovarov, P.F. Kononkov, V.P. Nikulshin, S.S. Litvinov, V.N. Lukyanes . Such scientists as Shibutani, T.Okamura, R.Isoda, S.Kumazawa, M.Yamato (Japan), A.Bastidas (India), D.E.Cook (USA) conducted.

However, in Uzbekistan, scientific and research works on the selection of cocktail-type varieties of tomatoes suitable for greenhouse conditions and the development of some elements of the technology of cultivation have not been carried out.

Among the vegetable crops of Uzbekistan, tomato is the most popular and widespread, and it ranks first in terms of area and gross yield. Tomatoes make up 40-45% of the total area of vegetable crops. A number of scientists contributed to extensive research and development of tomato varieties and hybrids suitable for greenhouse conditions, as well as development of resource-saving agrotechnology. They are Rijk Zwaan (Netherlands), Tong (China), P. Bosland (USA), B.A. Bryzgalov, V.E. Sovetkina, G.I. Ganus, P.P. Ivanenko, A.B. Prilipka, A.G. Abdullayev, M. Kamolov and others.

For the first time in Uzbekistan, scientific research works and scientific bases are being studied for selecting cocktail-type varieties of tomatoes suitable for the soil-climatic conditions of Uzbekistan, especially for unheated greenhouses, determining the optimal planting period and schemes.

The origin and varieties of the cocktail-type variety of tomato. Tomatoes are native to South America. Tomatoes were first grown in Peru, Ecuador and Chile. It began to spread throughout the world only after the Spanish began to establish colonies in America. Plant species similar to the currently cultivated tomato were also found in the Galapagos Islands. It was first cultivated in Mexico. It was brought to Europe by Spanish colonizers and European merchants, first to Spain, Portugal, and later to Italy, France and other countries.

Initially, tomatoes were grown and cared for in pots as a beautiful flower in homes and yards. It was brought to Central Asia from Russia for the first time in the 19th century by the big businessmen of their time, Afzalkhojaboy, Muhammadsiddigboy and Saidazimboy.

At first, tomato was considered a poisonous plant and was cultivated by gardeners only as a decorative plant. In the middle of the 13th century, it was widely cultivated in Russia. Tomatoes entered Central Asia, including Uzbekistan, through Russia. Although it came to Europe in the 16th century, it was cultivated as an ornamental and medicinal plant for a long time.

At the end of the 18th century, tomatoes were cultivated as a food crop. In the middle of the 19th century, it spread widely to Russia and southern Europe, and from the end of the last century, it was also cultivated in Central Asia.

Currently, 4.4 million hectares of land are planted in the world, and 123.7 million tons of gross crops are grown. The main tomato growing countries are China (31.6 million tons), USA (11.0 million tons), Turkey (9.7 million tons), Italy (7.8 million tons), India (7.6 million tons), Egypt (9.6 million tons).

Although tomato is used as a tomato in scientific terminology, in Uzbekistan both the plant and the fruit are called tomato or "pamildori" among the people. In the 19th century, after tasting its taste in European countries, it gave the first positive evaluation. Italian biological scientists gave this wonderful fruit the name "tomato" - "golden apple". It was the Italians who started eating tomatoes with pepper, onion, and garlic as an addition to various dishes.

Today, tomatoes have a special place in human food, and we can see tomatoes or its products on every table. When tomatoes were first discovered, they were afraid to eat them. We know that tomatoes belong to the family of spp., and because there are many poisonous plant species in this family, tomatoes were considered as poisonous as their fellows.

J. Gerard, a famous English doctor, botanist, head of the London Botanical Garden, thought that the fruits and leaves of tomatoes were poisonous and banned their consumption in England, but J. Gerard knew that at the same time, the people of Italy and Portugal considered tomatoes to be edible. they knew Therefore, in order to find out that tomatoes are not poisonous, Gerard grew tomatoes in his botanical garden and conducted scientific research on them. The population believed in the opinion of scientists so strongly that because of the information given by them, they did not eat tomatoes for 2 centuries and started consuming them only in the 18th century.

According to another legend, King Louis of France ordered a prisoner kept in the Bastille to be fed with tomatoes for a month. The king thinks that it will kill a person like a poisonous plant, unfortunately, the prisoner ate tomatoes for 4 weeks and survived, the prisoner who ate freshly picked tomatoes did not die, but his health improved. After such a change, the king is surprised and pardons him.

Tomato (Solanum lycopersicum) is an annual plant that can grow up to 2-3 meters and is a perennial plant in tropical climates. Tomatoes are divided into 4 types depending on the structure of the stem and leaves:

Shtambli - the stem is thick, less branching, standing upright even with fruits.

Stemless - the stem is thin, strongly branched, the fruit falls down under the influence of its weight.

Potato - large-leaved.

Small tomatoes - thin stems, strong branching, small fruits like cherries.

Cultivation of cocktail-type tomato varieties began in 1973. The goal of the scientists was to prevent quick ripening of cocktail-type tomatoes in hot climates. A genetic combination that promotes slow ripening has been replicated, but at the same time, a method has been found to use the resulting genes to breed small cherry tomatoes. Thus, the culture was reflected in the creation of these mini tomatoes.

Cocktail-type varieties of tomatoes also include mini cherry tomatoes. Cherry cocktail tomatoes are the fastest growing of all tomatoes.

Varieties of cherry tomatoes are widespread in the garden economy and around the city. These tomatoes have a decorative appearance. Tomatoes are vegetable fruits with the same taste and color, and at the same time, they are attractive with their compactness and decorative appearance. In addition, cocktail varieties of tomatoes are one of the vegetables that are very convenient for the winter in canned form.

Yellow varieties of cherry tomatoes are orange grapes. The taste of tomatoes is sour, they are perfectly stored. Several hundred yellow fruits grow on the brush. Turkey is characterized by a high amount of carotene - beneficial aspects that affect good eyesight.

The Kira F1 variety is distinguished by early ripening compared to other tomatoes during ripening and storage (up to 2.5 months). Fruits are 16-20 pieces per bush and are dark red in color.

Cherry pink tomatoes are grown in unheated greenhouses. The fruit is pink in color and weighs up to 23 g. Bourgeois prince is one of the best and high-yielding types of cherry tomatoes. These tomatoes are resistant to any diseases and ripen early. The fruits are red in color and are a very good variety for canning and drying. It does not lose its unique taste and aroma during processing. These tomatoes are among the varieties adapted for growing in greenhouses.

Alkaloid toxins are found in this vegetable, which belongs to the tomato family, in a small amount and is considered safe for human life. Tomatoes are also grown in botanical gardens where medicinal plants are grown in Europe and the Netherlands.

Among the vegetable crops in Uzbekistan, tomato is the most popular and widespread, and it ranks first in terms of area and gross yield. Tomatoes make up 35-38% of the total area of vegetable crops. Tomato is one of the vegetable crops with high nutritional value. Its ripe fruit is extremely tasty and nutritious, and contains various vitamins, mineral salts, organic acids and carbohydrates.

The composition of the tomato fruit is variable and depends on such factors as the variety of the crop, the degree of ripening of the fruits, the period of harvesting, the growing conditions and technology. Tomatoes are eaten fresh, salted and marinated. It is an important raw material for the canning industry.

Tomato fruits are ripe after picking and are resistant to long storage. Therefore, after harvesting, its consumption period can be extended by another 1.0-1.5 months.

The tomato root reaches a depth of 1 meter, the diameter can be up to 2.5 m, under favorable conditions, the roots can appear in any vegetative parts of the plant, so tomatoes can be planted not only with seeds, but also with branches. A new branch of tomato will form new roots after 2-3 days in water.

Tomatoes are heat-loving plants. Tomato is a self-pollinating plant, and at the same time it can be pollinated by other plants.

The soil of the experimental area is grassy gray soil. These soils contain 1.5-2 times more nutrients that are easy for agricultural crops to absorb: humus, nitrogen, phosphorus, potassium and other nutrients compared to newly developed soils.

One of the main factors determining the level of soil fertility is the mechanical composition of the soil. It helps to determine its physical and chemical properties.

The mechanical composition of the soil of the experimental field is medium sand. During tillage, the mechanical composition of the soil is not compacted, the water permeability and ion retention structure are good.

There will be no heavy rain after precipitation. The level of Sizot water is 5-6 meters. The physical properties of the soil and soil moisture play a major role in increasing the fertility of this soil.

One of the factors that increase the level of high productivity of the soil is that it is provided with agrochemicals. Such substances include humus, nitrogen, phosphorus, potassium.

Humus is a complex organic compound of a dark color that has changed as a result of the decay of the remains of plant and animal organisms in the soil. With the increase of humus in the soil, the amount of nitrogen also increases accordingly. A large amount of soil humus is the main indicator of its productivity.

Phosphorus content in the soil ranges from 0.182% to 0.295%, and total potassium ranges from 0.566% to 1.264%. It is too little. The mobile phosphorus element was determined in the range of 44-56 mg/kg, exchangeable potassium in the range of 115.5-136.6 kg/mg.

The area where the experiment was conducted belongs to the temperate mountain region in terms of climate. Due to the fact that the valley is surrounded by mountains on all sides, changes in climate indicators change gradually.

Andijan region has its own complexity. That is, the low total amount of precipitation during the growing season of plants leads to warming of the weather and soil in the summer months, and an increase in the level of evaporation of moisture in the soil.

According to long-term data, the first snow cover on the soil occurs at the end of December.

In early spring, the snow melts on the ground at the end of February and the beginning of March. The winter period is short, the annual average precipitation is 276.3 mm, 70-80% of this precipitation falls in the winter and spring months. The level of evaporation will be high. Due to the fact that there is no severe cold in the winter season throughout the year, and due to the high weather and soil temperature in the summer months, it is convenient to grow all types of crops on these farm lands.

It was noted that the average air temperature in the experimental year was slightly colder in January, February, March and April compared to many years. Therefore, the date of planting tomatoes fell on April 15. Development of morphobiological characteristics and some elements of cultivation of cocktail-type samples of tomatoes in winter-spring rotation in unheated greenhouses.

To achieve this goal, the following tasks are planned:

On the example of Andijan district of Fergana Valley, selection of tomato cocktail type varieties suitable for cultivation in soil and climate conditions, selection of cocktail type tomato varieties in unheated greenhouses, determination of optimal planting periods to ensure a higher yield than cocktail type tomato varieties.

RESEARCH OBJECT

The object of the study is the seed, plant, leaf and harvest of the tomato cocktail variety samples belonging to the foreign selection. The subject of the research is 3 planting periods (February 15, March 20, April 15), 1 planting scheme (60×30 cm) is taken in the development of some elements of cultivation of tomato cocktail-type variety samples.

The scientific novelty of the research is as follows:

Cocktail varieties of tomatoes are separated in unheated greenhouses; the optimal planting period for the cultivation of cocktail-type varieties of tomatoes is determined; in order to obtain a high and high-quality harvest of tomato cocktail-type varieties, the most convenient planting scheme and plant nutrition area are found; planting seeds of cocktail-type tomato varieties and caring for seedlings; cocktail-type tomatoes identification of the earliest ripening and mid-ripening cultivars from cultivar samples.

Scientific and practical significance of research results. For the first time in unheated greenhouses, it can be explained by the important scientific importance of studying and selecting samples of cocktail-type varieties of tomatoes in the winter-spring rotation, determining the optimal planting period and scheme.

In the experiments, phenological observations, biometric and productivity measurements were carried out:

1. Determining the number of seedlings. After 3-4 days of planting seedlings, the number of seedlings was counted in each repetition, and the number of captured plants in each field was

determined.

2. Phenological observation. Phenological observations were carried out on leafing and branching of plants.

3. Mathematical statistical processing. Seedlings planted in an unheated greenhouse were taken from samples of the cocktail variety, and the calculated parameters were subjected to mathematical and statistical processing according to the method of B.A. Dospekhov (1985).

Optimum planting dates for the earliest and most productive production of cocktail-type varieties of tomatoes are developed and recommended for production.

CONCLUSION

Based on the results of my studies on the topic of developing the technological elements of the cultivation of cocktail-type varieties of tomatoes, I came to the following conclusion that there is no unanimous opinion among researchers on the issue of the origin of the cocktail-type variety of tomatoes, because no scientific research has been done on the cocktail-type varieties of tomatoes. However, the selection of "cocktail" varieties of tomatoes and the development of technological elements of cultivation in greenhouse conditions of the republic is an urgent problem. Analysis of marketability and biochemical composition of such varieties of tomatoes in order to determine the quality, size, freshness and suitability for consumption of their fruits in order to grow samples of cocktail-type varieties of tomatoes.

To put an end to seasonality in the cultivation of cocktail-type varieties of tomatoes, to build more greenhouses, greenhouses, hothouses and unheated greenhouses, to heat them from solar energy, natural hot water, natural gas, hot water, steam, smoke gases used by enterprises. use is very important. Well-fertilized, nutrient-rich, well-drained cool soils are suitable for growing tomatoes.

As a result of studies, newly created hybrids suitable for growing in an unheated greenhouse, folk selection and introduced varieties, samples of tomato cocktail type varieties are distinguished from them with the following characteristics;

- cocktail-type varieties of tomatoes resistant to cold, heat, drought, compact bushes, large fruits, vitamins, and varieties that ripen at the same time are selected;
- cocktail-type varieties of tomatoes suitable for unheated greenhouses are selected.

It is necessary to use different substrates to grow cocktail-type samples of tomatoes in unheated greenhouses.

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