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STUDY ON THE CHEMICAL COMPOSITION OF TOMATOES

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Abstract

The requirement to increase the production of vegetables in general and tomatoes in particular is intensified by their logical, nutritional, particularly high value. With the establishment of scientific criteria for assessing the nutritional value of consumer products, with the appreciation above all of their nutritional content, increased interest in expanding the consumption of tomatoes due to their nutritional value, but also therapeutic. Vegetables are among the agri-food products with priority importance, and of these tomatoes occupy the first place (Petrescu, 1997).

Key words: tomatoes, dry substance, vitamin C, minerals.

INTRODUCTION

According to existing research, the food requirements of the human body can be met by an average daily food ration, consisting of foods of animal origin 714g and 1225 g of foods of plant origin, of which 400g must be vegetables (Gontea, 2011).

If in 1995, in the world production of tomatoes on the first place is Europe with 15.5 million tons per year, followed by North America with over 14.2 million tons per year, in 2015 on the first place is Asia with 34.4 million tons per year , followed by Europe with 17.7 million tons and North America with 16.7 million tons (FAO 2017).

In 1977 the area occupied by the globe was 2.2 million hectares with a production of 45 million tons, so that in 1994 it reached 2.9 million hectares with a production of 77.5 million tons, and in 2017 it increased to 3.7 million hectares with a production of 95.5 million tons.

The production of tomatoes in the main cultivating countries in Europe, generally registers increases as a result of the improvement of the technologies of culture, intensifying trade and widening the range of use (Potter 2015).

MATERIAL AND METHOD

Chemical analyzes of tomato fruit composition were performed on plants grown in a bifactorial experiment.

Factor A - place of culture - a_1 in the field;

- a_2 in solar.

Factor B - fertilization regime - b_1- unfertilized plants

- b_2- fertilized plants when the level of the three macro elements (N, P, K) decreases to critical levels.

By combining the factors, four experimental variants were made, placed in blocks divided into four repetitions.

The surface of the experimental plot was 10 m^2, and of the whole experience 160 m^2. The number of plants harvested at the experimental plot was 27.

RESULTS AND DISCUSSION

Chemical analyzes of the composition of tomato fruits show that the place of cultivation and fertilization regime changes the content of dry matter, vitamin C and essential minerals (N, P, K).

It was found that the fruits with the highest dry matter content were those of fertilized solarium plants, when the level of macro elements fell to critical levels (Velicica Davidescu 1992).

Fertilization of tomato crops in the field and in the sun is based on soil analysis, and the content of normal mineral substances in the soil will be achieved and maintained for their optimal fruiting development, which also depends on the nature of the soil and its organic matter content (Lacatus 1989). Due to the influence of environmental factors such as brightness, temperature, soil and air humidity regime and nutrient requirements specific to cultivated varieties and hybrids, it is necessary that the nutrients are found in the soil solution in a certain ratio that differs during vegetation period. (Verkerek 1989).

The application of chemical fertilizers both to basic fertilization and during vegetation is done with caution so as not to raise the content of soluble salts, because tomatoes do not support concentrations above 0.17% (Berstein1990). The specific consumption of nutrients necessary to achieve high yields in tomatoes grown in solarium differs from that of tomatoes grown in the field. (Table 1)

Table 1

Specific consumption of tomato mineral substances in field and solar crops

Culture	Production t/ha	Specific consumption (kg per tons of commercial product)				
		N	P_2O_5	K_2O	CaO	MgO
Tomatoes in the field	40	2.7	0.6	3.7	3.3	-
	35	3.14	1.1	4.0	4.0	-
	30	2.8	0.8	4.0	-	0.5
Tomatoes in solarium	80	3.1	0.6	7.7	-	0.63
	70	3.2	0.64	3.4	-	0.86
	50	3.8	0.94	6.3	5.3	-

The highest content of vitamin C was in the field of fertilized plant fruits only when N, P and K fell to critical levels of 22.5mg / 100g fresh tomatoes.

Table 2

The content of dry matter, vitamin C and minerals in tomato fruits under the influence of the place of cultivation and the fertility regime

Variants	Dry substance %	Variant C Mg/100g	Mineral substances % of dry substance		
			N	P	K
V1 - unfertilized field culture	6.0	20.5	2.58	1.55	5.31
V2 - fertilized field culture when the macro elements N, P, K they have fallen to critical levels	6.21	22.5	2.62	1.63	5.41
V3 - unfertilized solar culture	6.11	21.1	2.60	1.58	5.37
V4 - culture in solar fertilized when N, P, K have dropped to critical levels	6.37	21.8	2.75	1.71	5.49

The content of vitamin C is lower in the fruits of plants grown in solarium, a situation that can be attributed to the fact that the sun was shaded between July and August and that here had the highest values of growth elements.

Regarding the content in mineral substances, the highest value of nitrogen is found in the fruits of plants grown in solarium fertilized when the three macro elements have decreased to critical levels and the lowest in the fruits of plants grown in the field unfertilized regarding phosphorus and potassium.

CONCLUSIONS

The commercial quality of tomato fruits and their content in dry matter, vitamin C and mineral substances (N, P, K) do not differ essentially in the fruits of plants grown in solarium from those grown in the field.

The growth and development of tomato plants is much more accentuated in solarium cultivation than in field cultivation.

The dynamics of tomato fruit harvest extends over a period of five months in the solarium compared to three months in the field.

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