

## RESEARCH ON TOMATO PRODUCTION IN EXTENDED CYCLE IN GREENHOUSES

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### RESEARCH ARTICLE

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#### Abstract

*This paper presents the production of 3 tomato hybrids in an extended cycle that were cultivated on an area of 1000 square meters of heated greenhouse with different growth cycle. Each hybrid obtained a different result, which were than compared. The main purpose of the study was to follow the hybrids to determine the early and maximum production in certain periods of the vegetative cycle and having a different number of inflorescences.*

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**Keywords:** (max. 5) research, vegetable farm, hybrids, tomato, production.

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#### INTRODUCTION

The origin and importance of tomatoes, the distribution area.

The spontaneous forms of tomato come from South America, Peru Bolivia, from the altitude area, where the fruits have been used for food since ancient times. The native populations of Peru, Columbia and Mexico have cultivated the spontaneous forms, (*Lycopersicon esculentum* conv. *Cerasiforme*) and through selection they ended up obtaining forms with large fruits, which in sec 2nd (i.e.n.) were well known and cultivated in the Tehuaccan Valley, in the area of Vera Cruz and Pueblo localities (Jenkins 1948, cited by Indreea 2009 ) The Aztec name of the plant "tomato" (swollen) is of course the connection with the shape and size of the fruit (Dassler. 1969 cited by Indreea etc al.. 2009).

After the discovery of America, tomatoes were brought to Europe and through Spain, Portugal they arrived in Italy where they endured a second domestication "(Harlan. 1975, cited by Indreea etc al.. 2009). For a long time tomatoes were considered poisonous, with ornamental and pharmaceutical importance, having some aphrodisiac properties, which is why after the

first Spanish name " mala peruvianna" others followed such as " poma amoros"(pomme d'oro( Indreea etc al. 2009)

Plants also have names such as baradici, domade, gogonele, galatana mihlele porobici, tomate, etc. In 1753, Carl Von Line, classified the tomato in the genus *Solanum lycopersicum*. In 1768 Philip Miller moved the tomato to a separate genus and gave it the name *Lycopersicom esculentum* , this name becoming the usual one. The tomato also appears under another name, given by H. Karst (Herman. Karsten) in a publication from 1881, *Lycopersicon lycopersicum* (L), about which the author claims that " technically this is the correct name". However genetic studies have shown that Linnaeus correctly identified the genus *Solanum* with the actual name of the tomato, *Solanum lycopersicum*. Herbaceous, annual plant, in the temperate climates of the globe and perennial in tropical climates, it is a vegetable plant with therapeutic value. The original species is considered to be *Lycopersicon esculentum* var.

*Cerasiformes* The archaeological discoveries in the Teotihuacan Valley-.Mexico attest to the culture of red plantains as early as 200 BCE-700 CE. They were brought to

Europe by the Spanish conquistadors under the name of "Peruvian apples", where received with reservation, used at first as ornamental plants- with small, red fruits similar to cherries.

Over 200 years passed until tomatoes were considered as food plants and spread as such, at the end of the 18th century in the countries of Western Europe and at the beginning of the 19th century in the rest of the European countries and in North America, as well as in our country. From the correspondence of Ion Ghica addressed to Vasile Alecsandri, it appears that tomatoes were also known in the Romania Principalities. Further, the evolution of the culture is slow, tomatoes finding their way to consumers' taste with difficulty.

#### MATERIAL AND METHOD

The research was carried out in the year 2022, in a vegetable farm in the town of Nojorid (North-West Romania). The monofactorial experiment had as biological material three tomato hybrids and the average of the experience was taken as the control. The variants were arranged by the method of subdivided blocks. Statistical processing was done by analysis of variance.

The determination of tomato production in an extended cycle was carried out on an area of 1000 square meters of heated greenhouse cultivating three tomato hybrids, namely: the hybrid with determinate growth MIRSINI F1, the hybrid with semi-determinate growth GRAVITET F1 and the hybrid with indeterminate growth MONTE ROSSA F1, benefiting from the same Early tomato production

conditions and culture technology. The plants were sown on January 5th in alveolar trays with 70 nutrients cubes, 4 centimeters in diameter, and transferred to 9-centimeter pots on February 5-10. On March 15-20, the plants were planted in the ground, having an age of 70-75 days.

To the hybrid with determinate growth MIRSINI F1 the first inflorescence appears after 6 nodes, respectively 5 internodes, to the hybrid with semi-determinate growth GRAVITET F1 the first inflorescence appears after 7 nodes respectively 6 internodes and to the hybrid with indeterminate growth MONTE ROSSA F1 the first inflorescence appears after 8 nodes respectively 7 internodes, these physiological aspects being very important because they directly influence the production and earliness of each individual hybrid. The palisade of the plants was made at a height of 2.5 meters, the plants not having the same height. The density of plants per square meter is 3 plants, achieving a density of 3000 plants for 1000 square meters, 1000 plants of each hybrid.

#### PURPOSE AND OBJECTIVES

The main purpose of this study is to follow the production for each individual hybrid in the interval: June 1 - September 19 and determine their earliness in this period and also the quality of the fruits.

#### RESULTS AND DISCUSSIONS

As I specified in the first part of the paper, the culture technology was carried out according to the specific model of the culture cycle in heated greenhouse in an extended cycle.

June 1 – July 15- Nojorid (2022)

Nr. crt.	MONTE ROSSA (Hybrid I)	Pr. obs. Kg/m <sup>2</sup>	Relative production y <sub>0</sub>	<sup>+</sup> d Kg/m <sup>2</sup>	Semnificația
1	MONTE ROSSA	1,30	65,600	- 0,70	000
2	GRAVITET	2,20	110,00	+ 0,20	-
3	MIRISIMI	2,50	125,00	+ 0,50	xx

4	Media Mt	2,00	100,00	0,00	–
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DL 5% = 0,24

DL 1% = 0,36

DL 0,1% = 0,61

Tomato production:

July 15 – August 18 Nojorid 2022)

Nr. crt.	GRAVITET (Hybrid)	Pr. obs. Kg/m <sup>2</sup>	Relative production y <sub>0</sub>	- <sup>+</sup> d Kg/m <sup>2</sup>	Semnificația
1	MONTE ROSSA	2,00	100,00	0,00	–
2	GRAVITET	2,50	125,00	+ 0,50	xx
3	MIRISIMI	1,50	75,00	– 0,50	00
4	Media MT	2,00	100,00	0,00	–

DL 6% = 0,24

DL 1% = 0,30

DL 0,1% = 0.61

Tomato production:

August 18 – September 19 (Nojorid 2022)

Nr. crt.	MIRISIMI (Hybrid)	Pr. obs. Kg/m <sup>2</sup>	Relative production y <sub>0</sub>	- <sup>+</sup> d Kg/m <sup>2</sup>	Semnificația
1	MONTE ROSSA	1,50	150,00	– 0,50	xxx
2	GRAVITET	1,00	100,00	0,00	–
3	MIRISIMI	0,50	50,00	– 0,50	000
4	Media Mt	1,00	0,00	0,00	–

DL 5% = 0,12

DL 1% = 0,16

DL 0,1% = 0,27

Autumn tomato production: (Nojorid 2022)

Nr. crt.	MEDIA MT (Hybrid)	Pr. obs. Kg/m <sup>2</sup>	Relative production y <sub>0</sub>	- <sup>+</sup> d Kg/m <sup>2</sup>	Semnificația
1	MONTE ROSSA	4,80	46,0	– 0,20	–
2	GRAVITET	5,70	114,00	+ 0,70	X
3	MIRISIMI	4,50	90,00	– 0,50	–
4	Media Mt	5,00	100,00	0,00	–

DL 5% = 0,60

DL 1% = 0,1

Quality tomato

Nr . crt .	Alternative	Total productio n	Extra quality from the total		I din total quality		II din total quality		III din total quality	
			Kg/m <sup>2</sup>	%	Kg/m <sup>2</sup>	%	Kg/m <sup>2</sup>	%	Kg/m <sup>2</sup>	%
1	MIRISIMI	4,50	2,70	60,0 0	1,12	25,0 0	0,67	15,0 0	3,82	85,0 0
2	GRAVITET	5,70	3,13	55,0 0	1,59	28,0 0	0,96	17,0 0	4,73	83,0 0
3	MONTE ROSSA	4,80	3,36	70,0 0	0,96	20,0 0	0,48	10,0 0	4,32	90,0 0

In the tables above we have summarized the results of the production analyzes in the periods mentioned above for each individual hybrid and we have the last table that reflects the quality of the fruits. The first analysis was made for the early production between June 1 and July 15. Among the three hybrids analyzed, the hybrid of tomato MIRSINI F1 proved to be the earliest, recording an early production increase of 25 percent. The difference from the average of the experience was statistically interpreted as distinctly positive significant:xx. At the opposite pole with a production of 1.3 kilograms per square meter



the hybrid MONTE ROSSA F1 obtained only 65 percent of the production of the control, the difference to the control was ensured statistically very significant negative. The GRAVITET hybrid had a production close to that of the control, not exceeding the 5 percent threshold, not being statistically assured.

### CONCLUSIONS

The earliest hybrid among the three analyzed turned out to be MIRSINI, the most productive hybrid is GRAVITET also with a good early production and the last hybrid MONTE ROSSA seems to have the best quality.





BIOLOGICAL CYLCLE



HYBRIDUL MIRISIMI



HYBRIDUL MONTE ROSSA



HBRIDUL GRAVITET

**REFERENCES**

1. APAHIDEAN,AL.S. and colab., 2000, General vegetable: vol. I, Ed. Risoprint, Cluj-Napoca.
2. APAHIDEAN,AL.S. and colab., General vegetable 2000, vol. II, Ed. Risoprint, Cluj-Napoca.
3. BALAȘA, M., 1973, Vegetable, EDP, București.
4. BALAȘA, M., 1980 Vegetable, EDP, București
5. BERAR, V., 1998, Vegetable . Ed. Mirton, Timișoara.
6. BUTNARIU, H., and colab., 1990, Vegetable, Agronomic Institute Timișoara.
7. CHAUX, F., C., FOURY, 1994, Productions legumiers, TEC-DOC, Paris, France.