

## UPGRADED TECHNOLOGY FOR OBTAINING ECOLOGICAL TOMATO VARIETIES OWN VARIETIES, IN PLACES PROTECTED FROM INCDBH ȘTEFĂNEȘTI

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### **Abstract**

*After a break of several years of growing vegetables in INCDBH Stefanesti, this activity began again. In recent years were obtained eight tomato varieties that were grown and organic. ECO tomato production technology has been tested and evaluated by Biocert-Romania, body empowered to review implementation of existing standards in browsing the certification process. During the inspection were not notified any non-compliance regarding land conversion, nor in terms of acquiring knowledge, certification paperwork, mode and standard requirements applying organic crops. Drawing certification file included the following documents: application for certification; Recording sheet producers in organic farming; Plan culture; Conversion plan; Sketch of site; The inspection plan; Inspection accredited company; Certification Contract.*

*Keywords:* new variety, physiologically ripe tomatoes, strength, ecological technology.

### **1. INTRODUCTION**

To produce crops of table grapes is a profitable activity. Using varieties valuable land well located. Climate change roll over agriculture. Vegetables and cereals suffer from drought, and large temperature differences. Because of this, researchers are trying to obtain new varieties of tomatoes, peppers and cucumbers, to resist our sunburnt fields. Meanwhile, Israeli farmers received seeds from tomatoes that have adapted to our climate difficult, but the taste of tomatoes is not the same as many years ago.

The tomatoes are consumed fruit physiological maturity, and those that do not reach this stage (green tomato) for the preparation of pickles. Tomato particular importance is given to the food that they consume a wide range as follows: Fresh lettuce simple or mixed with other vegetable sauce, pot filled with various compositions red, etc. Industrial prepared in the form of paste, broth, canned, regular or spicy juices etc. Provisions of the World Food and Agriculture Organization (FAO) recommends consumption of vegetables in varying amounts depending on the age of consumers: up to 12 - 100 g / day over 12 years - 350 g / day, annual consumption reaching 120 kg vegetables.

## 2. MATERIALS AND METHODS

The experimental model in protected and vegetable seedling production after its own technology approved as being organic certification body was placed in the greenhouse for organic crops (Sirup Code 13392, physical block 780, lot C28) at INCDBH Ștefănești.

Experimental model consisted of horticultural plant production (vegetables from *Solanum lycopersicum*) in the following experimental:

- V<sub>1</sub>, plants planted in boxes mixed distances to ensure a space edafic approximately equal to those of biodegradable pots;
- V<sub>2</sub>, PVC pots with 300 cm<sup>3</sup> volume of repetitions x 3 x 28 plants / repetition;
- V<sub>3</sub>, biodegradable PVC pots with volume of 300 cm<sup>3</sup> x 3 x 28 repetitions plants / repetition;
- V<sub>4</sub>, Jiff volume pots with 150 cm<sup>3</sup> x 3 x 28 repetitions plants / rehearsal.

For experimental model studied vegetable plants were used vegetable seeds of the species *Solanum lycopersicum* certified Bio (tomatoes) with undetermined growth of new varieties obtained in 2013 from INCDBH Ștefănești (Ștefănești 22 and Costate 21) and two biotypes all from production bathroom with determined growth achieved in 2012 (Arges 11 and 20) having a witness for earliness, yield and resistance to pathogens variety Notorius. Provenance seed was provided from own production and from SCDV Bacau, Romania garage for the production of organic seeds, but we had a more generous offer of species of interest to us, so we were forced to limit ourselves to four varieties.

## 3. RESULTS AND DISCUSSION

### Choosing nutrient mixtures for sowing and transplanters

Choosing a nutrient mix to eliminate possible stress planting and transplanting seedlings should consider it to meet a number of minimum mandatory conditions:

- have a balanced content between macro and micronutrients in order not to induce mineral nutrition deficiencies;
- have an organic matter content of between 3-3.5 %;
- have a water retention capacity large enough so they can be removed hydric stress caused either by excess moisture or lack thereof;
- to maintain a structure of structural aggregates sufficiently stable so that the air-water ratio is favorable recovery and accelerated growth of plant roots transplanted;
- components of the mixtures do not come from chemically polluted areas or in areas where conventional farming is practiced.



Figure 1- Tomato seeds



Figure 2- Sunrise tomato seeds

Calendar entries:

a) **Preparation of seeds for sowing** consisted of performing a treatment with infusion of chamomile and basil, both species with disinfectant and bacteriostatic effect (Figure 1).

**b) Sowing was done in both species in the same period** in caskets with nutrient mixture composed of garden soil, sand and ground celery in parts equal to 1/3 volume, to which was added an amount of peat to increase the water retention capacity, for  $V_1$  and pots filled with the same type of mixing  $V_2$  and  $V_3$ , as well as the jiffy pots wetted  $V_4$ . Sowing date was 18.02.2014. With no designated areas sowing was done in a room heated by a centralized system phytotron and naturally-lit building.

**c) East seed was produced by species such installments:** 22.02.2014 tomatoes and peppers on or around 25 02.2014 (Figure 2).

**d) Transplanters planting** was done only to variants which provided transplanters in pots of different sizes to study nutritional stress reduction planting. In order not to influence plant development depending on the variant applied bedding seedlings in both species was made on 22 and 23.03. 2014. Plant development was influenced by very cold during the nights and warm days, on the one hand and on the other greenhouse multiplier which has its own heating system and amplify the amplitude of circadian heat. Thermal amplitude between transplanters and growth of seedlings in pots ranged between 4-35 °C (Figure 3,4).

Specific works for the maintenance of seedlings: manual weeding of weeds, foliar fertilization with fresh nettle extract and Bionat product is a herbal extract and seaweed, repeated waterings, together with nutrients to maintain humidity at 60-70% of field capacity for retention water. Preventing the attack of insect repellents and products was performed using bioinsecticide extract black currant buds (*Ribes nigrum*) and the dried leaves of horsetail (*Equisetum arvense*) and castor (*Rhus typhyna*).



Figure 3-Tomato seedlings



Figure 4-Tomato seedlings



Figure 5- Setting greenhouse tomato crop



Figure 6 - Organic fertilized and  $\text{CaCO}_3$

The technology has been tested and evaluated by Biocert-Romania, body empowered to review implementation of existing standards in the certification process browsing. During the inspection they were not notified any non-conformities regarding land conversion, nor in terms of acquisition of knowledge, certification paperwork, mode and application requirements standards organic crops (Figure 5, 6).

**Table 1. VARIETY DENOMINATION – ȘTEFĂNEȘTI 22**

No. crt.	No. CPVO	Characteristics	States of Expression	Note
1.	2 G	Plant: growth type	indeterminate	2
2.	10 G	Leaf: type of blade	bipinnate	2
3.	21 G	Fruit: green shoulder (before maturity)	absent	1
4.	26 G	Fruit: size	very large	9
5.	28 G	Fruit: shape in longitudinal section	flattened	1
6.	36 G	Fruit: number of locules	more than six	5
7.	37 G	Fruit: colour at maturity	red	5
8.	43 G	Resistance to <i>Melodogyne incognita</i>	resistant	3
9.	44 G	Resistance to <i>Verticillium sp.</i> (Va and Vd) Race 0	absent	1
10.	45 G	Resistance to <i>Fusarium oxysporum</i> f. sp. Lycopersici	absent	1

The tables 1 and 2 are shown the characteristics and expressions are expressed by notes made by the body approved varieties (ISTIS Bucharest) varieties with unlimited growth.

**Table 2. VARIETY DENOMINATION – COSTATE 21**

No. crt.	No. CPVO	Characteristics	States of Expression	Note
1.	2 G	Plant: growth type	indeterminate	2
2.	10 G	Leaf: type of blade	bipinnate	2
3.	21 G	Fruit: green shoulder (before maturity)	absent	1
4.	26 G	Fruit: size	very large	9
5.	28 G	Fruit: shape in longitudinal section	flattened	1
6.	36 G	Fruit: number of locules	more than six	5
7.	37 G	Fruit: colour at maturity	red	5
8.	43 G	Resistance to <i>Melodogyne incognita</i>	highly resistant	3
9.	44 G	Resistance to <i>Verticillium sp.</i> (Va and Vd) Race 0	absent	1
10.	45 G	Resistance to <i>Fusarium oxysporum</i> f. sp. lycopersici	present	9

The tables 3 and 4 are played the characteristics and expressions are expressed by notes made by the body approved varieties (ISTIS Bucharest) for fixed-growing varieties

**Table 3. VARIETY DENOMINATION – ARGES 11**

No. crt.	No. CPVO	Characteristics	States of Expression	Note
1.	2	Plant: growth type	determinate	1
2.	10	Leaf: division of blade	pinnate	1
3.	23	Fruit: size	very large	9
4.	25	Fruit: shape in longitudinal section	rectangular	4
5.	34	Fruit: number of locules	three or four	3
6.	35	Fruit: green shoulder (before maturity)	absent	1
7.	39	Fruit: colour at maturity	red	5
8.	45	Resistance to <i>Melodogyne incognita</i>	resistant	3
9.	46	Resistance to <i>Verticillium sp.</i> (Va and Vd) Race 0	present	9
10.	47	Resistance to <i>Fusarium oxysporum</i> f. sp. Lycopersici	present	9

**Table 4. VARIETY DENOMINATION – ARGES 20**

No. crt.	No. CPVO	Characteristics	States of Expression	Note
1.	2	Plant: growth type	determinate	1
2.	10	Leaf: division of blade	bipinnate	1
3.	23	Fruit: size	very large	9
4.	25	Fruit: shape in longitudinal section	rectangular	4
5.	34	Fruit: number of locules	three or four	3
6.	35	Fruit: green shoulder (before maturity)	absent	1
7.	39	Fruit: colour at maturity	red	5
8.	45	Resistance to <i>Melodogyne incognita</i>	resistant	3
9.	46	Resistance to <i>Verticillium sp.</i> (Va and Vd) Race 0	-	-
10.	47	Resistance to <i>Fusarium oxysporum</i> f. sp. lycopersici	-	-

**Table 5. Measurements in new varieties of tomatoes**

Variety	Type of growth	Nr. fruits the inflorescence	Average fruit weight (g)	The average diameter fruit median (mm)	The average length of the fruit (mm)
Argeş 11	determined	8-10	176.6	70.9	76.3
Argeş 20	determined	4-5	242.6	70.5	75.9
Stefanesti 22	unlimited	5-6	218.3	76.5	66.8
Costate 21	unlimited	5-6	294.3	112.4	72.6



*Figure 7 - Culture tomato, new varieties*

#### 4. CONCLUSIONS

1. For efficient organic crops it is necessary to use local resources intelligently in an integrated knowledge-production-marketing-skills resulted in innovative technologies.
2. Tomato varieties obtained from Stefanesti INCDBH are recommended and can be expanded in culture and other areas of the country.
3. The new tomato varieties are suitable for both fresh consumption and for industrialization.
4. At INCDBH Ștefănești tomato seeds are produced from approved varieties, the institution is maintained even for Bio cultures.

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