

## STUDIES ON THE IMPLEMENTATION OF THE SUPPORT PROGRAM FOR TOMATOES IN PROTECTED SPACES IN 2017 AT THE COUNTY OF DOLJ

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### ABSTRACT

*In order to support vegetable growers, the Ministry of Agriculture and Rural Development initiated in 2017 the "Program of support for tomato producers in protected areas", in which the owners of at least 1000 m<sup>2</sup> of solariums, which marketed the production of at least 2000 kg during January - 15 June, and / or 23 October - 20 December, received from the state the sum of 3000 euros.*

*In 2017, at the level of Dolj county, 620 vegetable growers benefited from the provisions of the tomato product support program in protected areas, the area of tomatoes cultivated in the solariums being of 74,83 ha.*

*From centralized statistical data at the Dolj County Department of Agriculture, the area cultivated with tomatoes in solariums in the year 2017 was 125 hectares, resulting in the Program's share of the tomato area being 59,86% of the total area.*

*Regarding the cultivars used, there is a wide diversity, 620 vegetable growers cultivating 91 cultivars, 96% hybrids, but also varieties and even local populations.*

*In the hierarchy of varieties, predominates the Bulgarian hybrid Prekos F1, which cultivated in the area of 31,88 ha (42,60%).*

### INTRODUCTION

Tomato is a high cost, high value and high risk crop [1].

Tomatoes are among the world's most consumed vegetables, and the European Union, through its policies, wants to extend the fresh tomato marketing season.

The tomato crop is an important income generator for small producers. From the socio-economic point of view, almost all table-tomato production comes from family farmers, providing them with employment and income [3].

After the US, Italy, China and Spain, Turkey is the largest grower of processing tomatoes in the world [2].

In the 2016/2017 campaign, about 5 million hectares of tomatoes were grown globally, the harvested quantity being 3,7 kg per square meter. The EU produced about 18 million tonnes of tomatoes, of which 40% had been sold on the market in the fresh state [4].

In order to meet the eligibility criteria for the granting of financial support of 3 000 euro/beneficiary, the growers registered in the Agricultural Register open to the municipalities in whose administrative-territorial range the cultivated areas have fulfilled cumulatively the following conditions: they cultivated with tomatoes an area the minimum 1000 square meters, marked

visibly with an indicator plate, have obtained at least 2 kg of tomatoes / m<sup>2</sup> and have demonstrated the commercialization of production through supporting documents between January and June 15 for Cycle I and October 23 to December 20 for the Cycle II.

Of the 111 localities located in Dolj county, 49 localities accessed the Vegetable Tomato Program of,

mentioning that there were 33 localities registered where there is no tradition for vegetable growing in protected areas.

In Dolj County, the legume plant culture has an old tradition, the Poiana Mare and Dăbuleni vegetable basins being known for their quality and especially the early production seasons.

## MATERIAL AND METHOD

According to the program implementation methodology, the beneficiaries were identified, depending on the localities and the production and utilization cycle of the tomatoes, the areas, cultivated varieties were established, appreciations were made

regarding the cultivation technology, the phytosanitary status of the crops.

All this data allowed the making of a study on the orientation of the producers in Dolj County for choosing a tomato assortment that satisfies the market demand in the conditions of the highest economic efficiency.

## RESULTS AND DISCUSSIONS

The area cultivated with tomatoes in the solariums in the year 2017 at the level of Dolj County was 125 ha, of which 74,83 hectares were cultivated under the Program, resulting in the Program the share of the tomato area was 59,86 % of total area.

The area of 50,17 ha of tomatoes not included in the program belongs to vegetable growers with areas of less than 1000 m<sup>2</sup> or to vegetable growers who chose to grow and market tomatoes in protected areas at other times of the year than those provided for in H.G. 39/2017 (Table 1).

### The area of tomatoes cultivated in the Dolj County in 2017

*Table 1*

Nr. crt.	Specification	Surface (ha)	(%)
1.	Solariums cultivated with tomatoes in Dolj County	125,00	100
2.	Solariums cultivated with tomatoes in the framework of the producers' support program	74,83	59,86

Analyzing the Single Register for the Acceptance of the Tomato Product Support Program in Protected Areas, drawn up at the level of Dolj county, it is noticed that the weight of the vegetable growers registered in the tomato program is represented by the economic operators from the localities located in the conserved vegetable basins on terrace I

(III), Desa (226 vegetable growers), Poiana Mare (94 vegetable growers), Ciupercenii Noi and Dăbuleni (50 vegetable growers), Piscu Vechi (30 vegetable growers) and localities in the vicinity of Craiova, with potential for vegetable growing such as: Teasc (53 vegetable growers), Bratovoiești (15

vegetable growers), Almăj (6 vegetable growers), Isalnita (5 vegetable growers).

Regarding the distribution of beneficiaries on the two production and recovery cycles, it was found that the largest area was cultivated with tomatoes in Cycle I, namely 53,67 ha, representing 71,73% of the area covered by the

program tomatoes, indicating that 17 vegetable growers who failed to meet the eligibility conditions in Cycle I and continued tomato planting and utilization were also registered in Cycle II, the area planted in both cycles being 2,24 ha (figure 1).

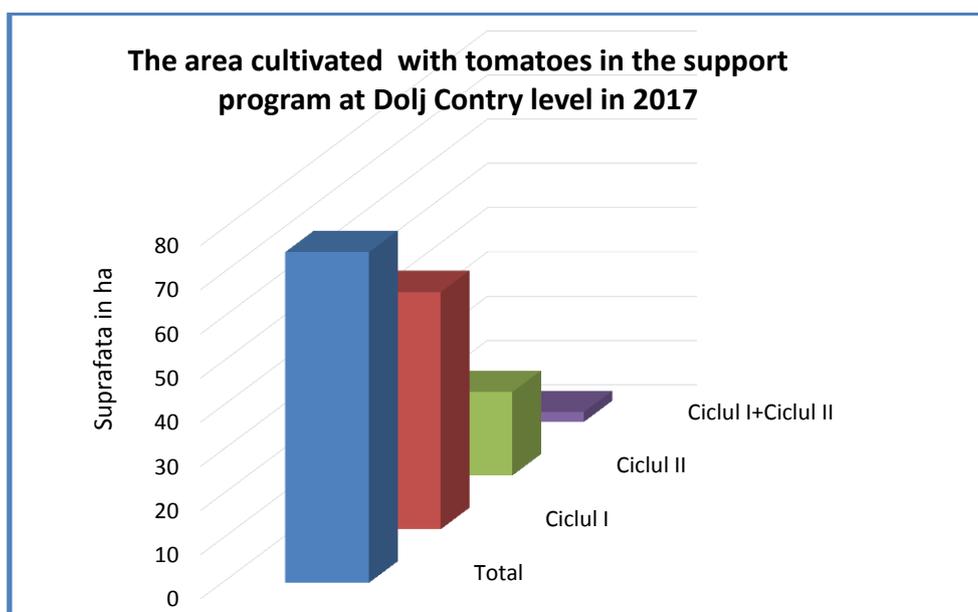


Figure. 1 The distribution of tomato area on production and recovery cycles

Regarding the distribution of beneficiaries on the two production and recovery cycles, it was found that the largest area was cultivated with tomatoes in Cycle I, namely 53,67 ha, representing 71,73% of the area covered by the program tomatoes, indicating that 17 vegetable growers who failed to meet the eligibility conditions in Cycle I and continued tomato planting and utilization were also registered in Cycle II, the area planted in both cycles being 2,24 ha.

Among the vegetable growers who benefited from the provisions of the Tomato Product Support Program, the vast majority (309 cultivators) have solariums with a surface area of 1000 - 1099 m<sup>2</sup> (49,83% of the cultivators), the area cultivated with tomatoes in such solariums of 33,25 ha (44,44% of the

area planted with tomatoes covered by the support program) (Table 2).

A number of 121 cultivators cultivated tomatoes in solariums with areas ranging from 1100-1199 m<sup>2</sup> (19,56%), totaling a total area of 13,80 ha, representing 18,44% of the area cultivated with tomatoes covered by the support program.

Also, after analyzing the data in Table 2, it was found that a number of 78 vegetable growers who accessed the support program in 2017 cultivated tomatoes in solariums that accumulate an area of more than 1400 m<sup>2</sup>. Most vegetable growers who cultivated tomatoes in protected areas with an area of more than 1400 m<sup>2</sup> come from Desa (31 vegetable growers), Poiana Mare (13 vegetable growers) and Teasc (4 vegetable growers).

## Number of growers benefiting from the Tomato Producer Support Program and the solarium areas owned

*Table 2*

Nr. crt.	The surface of sunflower cultivated with tomatoes (m <sup>2</sup> )	Number of vegetable growers		The cultivated area	
		Number	%	ha	%
1.	Solariums with surface in the 1000-1099 interval	309	49,83	33,25	44,44
2.	Solariums with surface in the 1100-1199 interval	121	19,56	13,80	18,44
3.	Solariums with surface in the 1200-1299 interval	70	11,29	8,7	11,63
4.	Solariums with surface in the 1300-1399 interval	42	6,77	5,74	7,67
5.	Solariums with surface in the 1400-1499 interval	29	4,67	4,81	6,43
6.	Solariums with surface in the 1500-1599 interval	17	2,74	2,62	3,50
7.	Solariums with surface in the 1600-1699 interval	13	2,10	2,13	2,85
8.	Solariums with surface in the 1700-1799 interval	2	0,33	0,34	0,45
9.	Solariums with surface in the 1800-1899 interval	4	0,63	0,72	0,96
10.	Solariums with surface in the 1900-1999 interval	5	0,80	0,98	1,31
11.	Solariums with surface in the 2000-2099 interval	4	0,63	0,80	1,07
12.	Solariums with surface in the 2100-2199 interval	1	0,16	0,21	0,28
13.	Solariums with surface in the 2200-2299 interval	-	-	-	-
14.	Solariums with surface in the 2300-2399 interval	2	0,33	0,46	0,61
15.	Solariums with surface in the 2400-2499 interval	-	-	-	-
16.	Solariums with surface in the 2500-2599 interval	-	-	-	-
17.	Solariums with surface in the 2600-2699 interval	1	0,16	0,27	0,36
<b>TOTAL</b>		<b>620</b>		<b>74,83</b>	

The largest area cultivated with tomatoes that was the subject of the support program was owned by a vegetable grower in Desa who cultivated tomatoes in Cycle I with an area of 2677,4 m<sup>2</sup>, only with the Prekos variety.

It was noted that all beneficiaries of the support program that cultivated tomatoes with an area of more than 1400 m<sup>2</sup> or more are legally organized in Individual Enterprises or Authorized Physical Persons.

Regarding the cultivars used, there is a wide diversity, 620 vegetable growers cultivating 91 cultivars, 96% hybrids, but also varieties and even local populations.

Official List of Varieties of Plants Cultivated in Romania for 2016 published by I.S.T.I.S. (the year when most of the seeds were purchased for solarium culture), includes:

- 45 tomato varieties for fresh consumption, out of which 26 Romanian varieties;
- 9 varieties for fresh consumption and for industrialization, all Romanian varieties;

- 12 varieties of tomatoes for industrialization, all Romanian varieties. Comparing the Official List with the list of varieties cultivated in Dolj's solariums, only 2 foreign hybrids (Prekos F1 and Reyana, Bulgaria) were cultivated in 2017 and only 5 Romanian varieties (Buzău 1600, Buzău 22, Buzău 47, Buzău 50 and Romec 557, the last two being varieties for industrialization), the remaining 86 being hybrids registered in EU catalogs that can be grown in any of the member countries, Romanian local populations or even varieties from non-EU countries. As cultivated area predominates the Bulgarian hybrid Prekos F1, being cultivated under the program area of 31,88 ha (42,60%).

Larger areas were cultivated with Gravitet F1 hybrids (9,13 ha, 12,21%), Reyana F1 (5,64 ha and 7,53% respectively), Mahithos F1 (4,93 ha, 6,58%)., Antalia F1 (3,28 ha, 4,38%), Sandoline F1 (2,38 ha, 3,18%), Medina (Olga) F1 (1,62 ha, 2,17%), Tolstoi 54 ha,

2,06%), Venice F1(1,18 ha, 1,58%) and Kiveli (0,84 ha, 1,11%). All other cultivars

occupied each area under 1 ha.

**Area of solariums cultivated with tomatoes depending on the country of origin within the program of support of tomato producers in Dolj County in 2017**

*Table 3*

Nr. crt.	Country of origin	Surface	
		(ha)	(% of the total)
1.	Bulgaria	39,52	52,82
2.	The Netherlands	23,33	31,18
3.	Turkez	3,99	5,33
4.	France	3,77	5,04
5.	Romania	1,84	2,46
6.	Japan	0,91	1,22
7.	USA	0,75	1,00
8.	Israel	0,27	0,37
9.	Serbia	0,24	0,32
10.	Hungary	0,12	0,16
11.	Spain	0,03	0,05
12.	Italy	0,03	0,05
<b>Total</b>		<b>74,82</b>	<b>100</b>

Thus, the first 10 cultivars total the area of 62,42 ha (83,40% of the area covered by the support program) and through the analysis of the agro-product characters, they illustrate the producers' roots in choosing the assortment.

Depending on the country of origin in the data of Table 3 it is found that in the Dolj county solariums mainly hybrids are cultivated in Bulgaria, the area cultivated with them being 39,52 ha, representing 52,82% of the total area.

There are Dutch hybrids with a surface area of 23,33 ha (31,18% of the area) and those in Turkey with a surface area of 3,99 (5,33%).

The Romanian cultivars, including hybrids, varieties and local populations, were cultivated on the area of 1,84 ha, representing 2,46% of the total area cultivated with tomatoes under the tomato program).

Vegetables who decided to include Romanian varieties, hybrids or

pollutants in culture come from 16 localities located in the county of Dolj and are mostly young farmers who have accessed European funds for installation.

The leading companies producing tomato seeds grown in Dolj County are Geosem Select in Bulgaria, which only supplies the Prekos F1 hybrid for 42,60% of the cultivated area and the other hybrids (Reyana F1, Kalina F1, Balcan F1, Roze F1 and Rozalina F1) accumulate 38,72 ha, respectively 51,75% of the area.

The hybrids produced by Geosem Select have very early fruits, with the unmistakable taste of tomatoes from the old Romanian assortment. Of the Dutch firms, Syngenta ranks first with 11,98 ha (16,02% of the area), with the most cultivated hybrids being Gravitet F1 (9,13 ha) and Sandoline F1 (2,38 ha) .

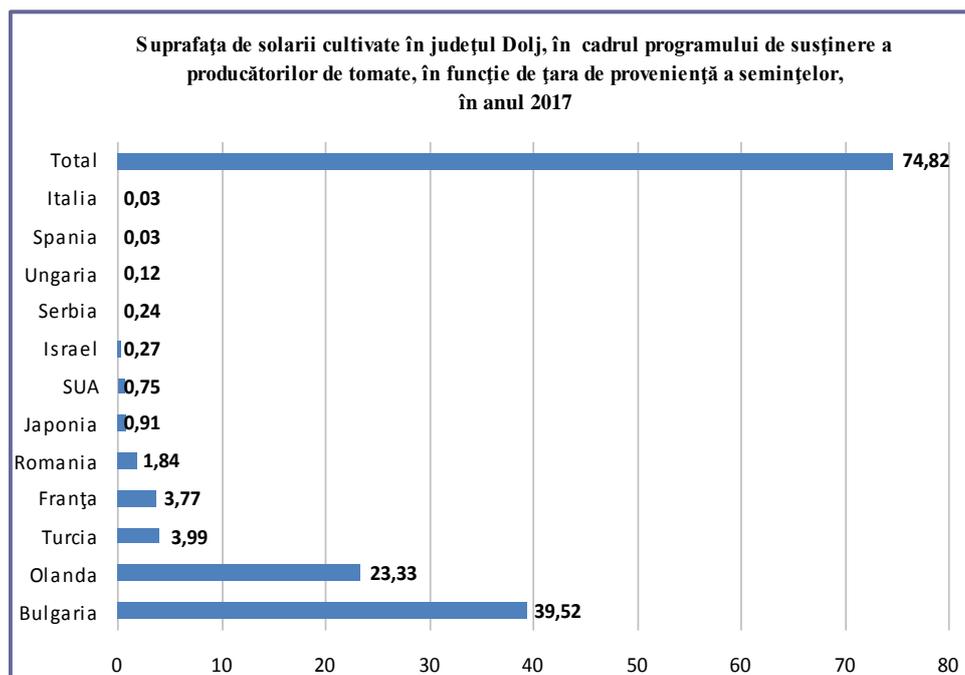


Fig. 2 Tomato area covered by the support scheme according to the country of origin of the cultivated seed

With the exception of Agrosel SRL, the Romanian companies present on the solarium tomato seed market are research units that have such hybrids in

their portfolio but have lower promotional opportunities than large seed companies (Table 4).

The area of solariums cultivated with tomatoes according to the production company under the program of support for tomato producers in Dolj County (year 2017)

Tabelul 4

Nr. crt.	Producing companing	Area	
		(ha)	(% of total)
1.	Geosemselect-Bulgaria	38,72	51,75
2.	Singenta -Olanda	11,98	16,02
3.	Clauss Vegetable Seed-Franța	1,81	2,42
4.	Hazera-Israel	0,76	1,02
5.	Seminis-Olanda	3,09	4,12
6.	Vilmorin -Franța	2,01	2,69
7.	Bejo -Olanda	1,60	2,14
8.	Nunhems -Olanda	0,79	1,06
9.	Rick Swaan-Olanda	5,27	7,04
10.	Yuksel -Turcia	3,99	5,33
11.	De Ruiten seed	0,02	0,03
12.	Sakata- Japonia	0,91	1,22
13.	Semilas Fito-Spania	0,03	0,04
14.	Enza Zaden-Olanda	0,06	0,08
15.	Superior Seed -Serbia	0,197	0,26
16.	Cora Seed-Olanda	0,20	0,27
17.	Florian -Bulgaria	0,02	0,03
18.	I.C.D.L.F. Vidra-Romania	0,24	0,32
19.	S.C.D.L. Buzău-Romania	0,45	0,61
20.	C.C.D.C.P.N. Dăbuleni-Romania	0,297	0,39
21.	Agrosel -Romania	0,38	0,51
22.	Populații locale -Romania	0,137	0,18
23.	Alte proveniențe	1,869	2,49
<b>Total</b>		<b>74,83</b>	<b>100</b>

Dolj County salons are located on soils of different natural fertility, from the best quality chernozems (Poiana Mare, Piscu Vechi, Moțetu, Ghidici) to sandy lands (Dăbuleni, Desa, Ciupereni,

Teasc), the differences being related the soil's ability to provide the nutrients needed, and the microclimate of the solariums.

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<b>Total</b>		<b>74,83</b>	<b>100</b>

Sandy soils have the advantage of warming faster and favoring early production, but tomato plants grown in sandy soils are more exposed to pathogens and pests. In recent years sandy soils have found an increasingly virulent attack on nematodes. As a result, it is to be expected that the selection of the tomato assortment will take into account these characteristics.

Table 5 shows the tomato cultivars from the solariums established within the Poiana Mare and Dăbuleni localities. There is also a wide variety of cultivars

found, the number of them being 20 in the Poiana Mare vegetable center and 19 in the dăbuleni vegetable center. In both centers the largest area of solariums is cultivated with the Prekos F1 hybrid, the share of the surface cultivated with this hybrid being 47,67% at Poiana Mare and 55,72% at Dăbuleni.

Tomato growers from Dăbuleni very well capitalize on the time caused by sandy soils and mainly cultivate high-precision hybrids (Prekos F1, Ryana F1, Sandoline F1), the share of these three hybrids in the total area being 84,64%.

**Varieties and areas cultivated with tomatoes in the program of support of tomato producers in Dolj county, in Poiana Mare and Dăbuleni vegetable centers (2017)**

**Table 5**

No.	Variety	Vegetable Center Poiana Mare		Vegetable Center Dăbuleni	
		(ha)	% of area	(ha)	% of area
1.	Prekos	5,31	47,67	3,12	55,72
2.	Gravitet	0,88	7,90	0,03	0,54
3.	Mahitos	1,60	14,36	0,07	1,25
4.	Medina	0,81	7,27	0,05	0,89
5.	Riana	0,41	3,68	0,81	14,46
6.	Sandoline	0,16	1,44	0,70	12,51
7.	Kiveli	0,21	1,88	0,09	1,61
8.	Kalina	-	-	0,09	1,61
9.	Alamina	0,06	0,54	0,12	2,14
10.	Dacia	-	-	0,10	1,78
11.	Lorelei	-	-	0,03	0,53
12.	Axion	-	-	0,04	0,71
13.	Belfast	-	-	0,06	1,07
14.	Rosalina Rose	-	-	0,10	1,78
15.	Giraffe	-	-	0,05	0,90
16.	Tuborik	-	-	0,04	0,71
17.	Bostina	-	-	0,04	0,71
18.	Sahmat	-	-	0,03	0,54
19.	Galina F1	-	-	0,03	0,54
20.	Magnus	0,44	3,95	-	-
21.	Amerigo	0,32	2,87	-	-
22.	Buzău 25	0,06	0,54	-	-
23.	Final F1	0,21	1,88	-	-
24.	Veneția	0,06	0,54	-	-
25.	Rugantino	0,07	0,63	-	-
26.	Romec	0,04	0,36	-	-
27.	Ghitia	0,09	0,81	-	-
28.	Belle	0,22	1,97	-	-
29.	Tolstoi	0,10	0,90	-	-
30.	Roza Belle	0,03	0,27	-	-
31.	Doufu	0,06	0,54	-	-
	<b>TOTAL</b>	<b>11,14</b>		<b>5,60</b>	<b>100</b>
<b>% of the area cultivated with tomatoes that was supported in Dolj county</b>		<b>14,89</b>		<b>7,48</b>	

In 2017 it was noticed that the producers were targeting the hybrids that can produce the earliest productions, preferring hybrids with semi-final growth (Prekos F1, Gravitet F1, Medina (Olga

F1), who cumulated a total of 42,63 ha and 56,96% of the tomato area covered by the support program, mentioning that the growth to 3-5 inflorescences was limited, so that large yields could be

achieved at the first harvests, the vegetable growers being able to fall within the provisions of the support program as regards recovery within the deadline set by the H.G. 39/2017.

Analyzing the first 10 hybrids cultivated under the program, whose surface represents 83% of the cultivated area, it was found that very large and very large hybrids were grown, these being the most demanded on the Romanian market. With the exception of the Tolstoi F1 and Medina F1 hybrids, all the other eight hybrids analyzed have fruit with an average weight of over 160 g, the Mahitos F1 hybrid having 250-300 g of fruit. All 10 hybrids have round or slightly flattened round fruits, except for the Prekos F1 hybrid, whose fruits are globular and have a specific mucron which is the certificate of taste for many consumers.

Regarding the tolerance to potato and pests, it has been found that hybrids with multiple tolerance (Gravitet F1, Kiveli F1, Mahitos F1) have been cultivated, as well as hybrids with tolerance to only some pathogens (Prekos F1, Reyana F1, Medina F1).

The Prekos F1 hybrid, tolerant to tomato mosaic virus (ToMV), verticilliosis (V), fusariosis (follicle 1-2 races), but not resistant to nematode

attack, was the most cultivated hybrid. For cultivation, the producers have paid great attention to microclimate conditions in solariums, phytosanitary treatments applied and cultivation technology. Thus, not being resistant to nematode attack, the Prekos F1 hybrid was cultivated mainly on uninfected land, in the first production cycle, when the attack was lower, or by taking special measures to combat it.

Romanian hybrids with taste qualities known and demanded by consumers in our country are very little cultivated by vegetable growers in Dolj County. The only producers of sunflower tomatoes are: National Institute for Research and Development for Biotechnologies in Horticulture Ștefănești (hybrids Argeș 16, Argeș 123, Ștefănești 24), Buzau Vegetable Research and Development Station (Carisma F1 Hybrids, Coralina F1, Emma de Buzau F1, Siriana F1), and the Dabuleni (Doljbrid F1 hybrid) Central Research and Development Center (Doljbrid F1), but these producers and keepers of tomato hybrids have little means of promotion and production than foreign firms and as a result these hybrids are less well-known and cultivated.

## CONCLUSIONS

According to centralized statistical data at Dolj County Agriculture Department, the area cultivated with tomatoes in solariums in 2017 was 125 ha, of which 74,83 ha were grown under the program.

Out of the 111 localities located in Dolj County, 49 localities accessed the Vegetable Tomato Program, mentioning that there were 33 localities where there is no tradition of vegetable growing in protected areas but stimulated by H.G. 39/2017, agricultural producers, between 1-4 agricultural producers / locals, delighted by the Government initiative, have invested in solariums, thus

becoming an example for other potential vegetable growers in 2018.

Approximately 50% of the beneficiaries of the support program have solariums with areas ranging from 1000 to 1099 m<sup>2</sup>.

It was noted that a number of 78 vegetable growers who accessed the support program in 2017 cultivated tomatoes in solariums that accumulate an area of 1400 m<sup>2</sup> or more, all of which are legally organized in Individual Enterprises or are Individuals Authorized Physicians, most of them running on projects with European funding.

The variety of hybrids / hybrids,

namely 91 cultivars, with 96% hybrids, but also varieties and even local populations, is justified by the desire of producers to provide the market and consumers with choice, given that tomato production has been used as a percentage over 97% in agri-food markets, weekly fairs, etc.

In the year 2017, in the county of Dolj, the program mainly cultivated hybrids from Bulgaria, the area occupied with these being of 39,52 ha, representing 52.82% of the total area.

The Dutch hybrids were cultivated on an area of 23,33 ha, being extensively followed by Turkish hybrids

grown on an area of 3,99 ha.

The Romanian cultivars, including varieties and local populations, occupied only 2,46% of the total area (1,84 ha).

Romanian hybrids known and requested by consumers in our country are very poorly cultivated by vegetable farmers in Dolj county, although before 1995 their share was over 90%.

The program to support the tomato cultivated in protected areas in 2017 showed a great interest among vegetable growers in Dolj county and its continuation in 2018 led to the inclusion of three times the number of vegetable growers in the program.

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