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Market analysis of the vegetable sector

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MARKET ANALYSIS OF THE VEGETABLE SECTOR

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Abstract: *The Romanian vegetable market is in continuous development, with consumers preferring local vegetables to the detriment of imported ones. Even though there is a very good potential and a fairly varied supply of fresh vegetables on the domestic market, some of the producers have given up making major investments, being discouraged by the massive imports of vegetables. The major objective of the paper is to carry out an analysis of the main indicators of the production, consumption and trade of vegetables in Romania. Thus, aspects related to the evolution of the areas cultivated with vegetables, the dynamics of productions in the vegetable sector, the evolution of vegetable consumption as well as the distribution of imports and exports of vegetables will be followed. These data will be analyzed for the period 2010-2022, using statistical calculation methods. With the help of the calculated indicators, a clearer situation on this sector will be highlighted.*

Keywords: *market, vegetable sector, statistical methods.*

JEL classification: Q11,Q13,Q17

INTRODUCTION

With a strategic importance for agriculture, the vegetable sector contributes to ensuring the food security of the population through diversified offers of accessible vegetables but also of raw materials for the processing and export industry (Zbancă and Negritu, 2020). The geographical extension of vegetable cultivation as well as the structure of the areas occupied with vegetable species should be put in line with the capacities of the main consumers (Movileanu, 2010).

The vegetable sector in Romania consists mainly of small and medium-sized producers who grow vegetables on their own or leased land, but there are also some large farms that use modern cultivation techniques. Vegetable production is mainly carried out by farmers who still use traditional cultivation methods (Sterie, 2023; Necula, 2015).

Being considered a resource and labor intensive activity, the commercial production of vegetables requires the use of quite a large number of labor in the stages of production, processing and marketing (Dias, 2010).

The inclusion of vegetables in the diet not only increases the diversity of the diet, but also maintains the normal functioning of the human body, favoring a better assimilation with other foods (Dumitrescu, 1998). The sale of consumer goods on the Romanian market is concentrated in supermarkets and hypermarkets. Romanian producers face difficulties in supplying large commercial centers with vegetables and fruits. This is mainly due to the seasonal production of vegetables and fruits, which results in low production and quality far below that imposed by the big operators (Ilie, 2020).

Fruit and vegetable trade is one of the most dynamic sectors of international trade, resulting in increased income and consumer interest in variety, freshness, quality and availability of products (Diop, 2005).

MATERIALS AND METHODS

The working documents used to carry out the study refer to a series of key information, through which the trends in the evolution of the market of the vegetable sector were identified. Thus,

in the analysis of the evolution of the vegetable sector, annual time series from the period 2010-2022 were used, for the following indicators: areas, productions, consumptions, imports and exports of vegetables. The study includes both brief analysis and statistical data on the vegetable sector market. Statistical information was provided by the Eurostat database, the Tempo Online database of the National Institute of Statistics and TradeMap – Trade Statistics for International Business Development.

RESULTS AND DISSCUSION

I. Analysis of cultivated areas and productions obtained with vegetables

According to Eurostat data, 1,891.21 thousand hectares were used for growing vegetables in 2022, which meant 1.2% of the agricultural area used at EU level (161,088.93 thousand hectares). Italy (20.39% of the area cultivated with vegetables at EU level), Spain (19.4%) and France (14.5%) have the largest area cultivated with vegetables in the EU. The area cultivated with vegetables in Romania represents 5.1% of the total EU (Table 1, Figure 1).

Table 1. Evolution of areas with vegetables (including melons) in Europe in the period 2010-2022 (1000 ha)

	eu	Italy	Spain	France	Poland	Germany	Romania	Netherlands	Hungary	Belgium	Greece
2010	--	487.60	326.96	245.50	199.50	107.82	169.96	89.57	68.36	60.50	103.33
2011	1,981.77**	412.09	316.01	243.50	238.40	108.61	174.14	74.71	76.06	53.67	98.45
2012	1,951.44**	403.77	318.22	243.19	235.30	111.46	170.66	72.43	77.54	52.14	92.01
2013	1,791.58**	349.31	318.51	186.53	187.80	109.06	166.06	73.87	76.38	45.97	95.19
2014	2,069.41	426.63	355.81	243.11	184.40	111.26	149.76	75.31	79.88	47.05	97.59
2015	2,074.06	422.90	354.68	235.53	188.80	110.90	150.57	86.80	84.48	58.44	82.00
2016	2,167.53	430.00	373.77	249.50	217.44	117.39	141.5	87.94	92.53	59.63	81.69
2017	2,148.61	418.38	380.08	259.14	191.98	124.96	138.56	92.50	94.11	64.29	82.70
2018	2,126.43	418.12	372.88	257.82	190.39	122.69	140.35	92.18	91.01	65.62	78.66
2019	2,143.23	420.86	380.22	256.18	190.10	123.86	143.31	97.40	89.31	67.33	69.52
2020	2,004.18	413.74	380.98	277.36	175.80	123.04	113.02	96.53	83.22	68.68	73.26
2021	2,051.18	413.86	396.57	288.32	172.90	128.47	113.15	104.02	80.96	70.15	77.04
2022	1,891.21	385.56	366.90	274.63	160.00	122.68	97.51	92.84	76.91	64.39	58.28
2022/2021	-7.80	-6.84	-7.48	-4.75	-7.46	-4.51	-13.82	-10.75	-5.00	-8.21	-24.35
2022/2010	-	-20.93	12.22	11.87	-19.80	13.78	-42.63	3.65	12.51	6.43	-43.60

Source: Eurostat.eu database, accessed November 2023, * - data not available, ** - European Union data – 27 countries (from 2020)

At the level of the EU countries, there was a decrease in the areas cultivated with vegetables in 2022 by 7.8% compared to 2021. This was mainly due to the unfavorable weather but also to the increase in the costs of all inputs. According to Eurostat data, the area cultivated with vegetables in Romania fell in 2022 to the lowest level since 2010, registering a decrease of -24.4% compared to 2021 and -43.6% compared to 2010 (Figure 1).

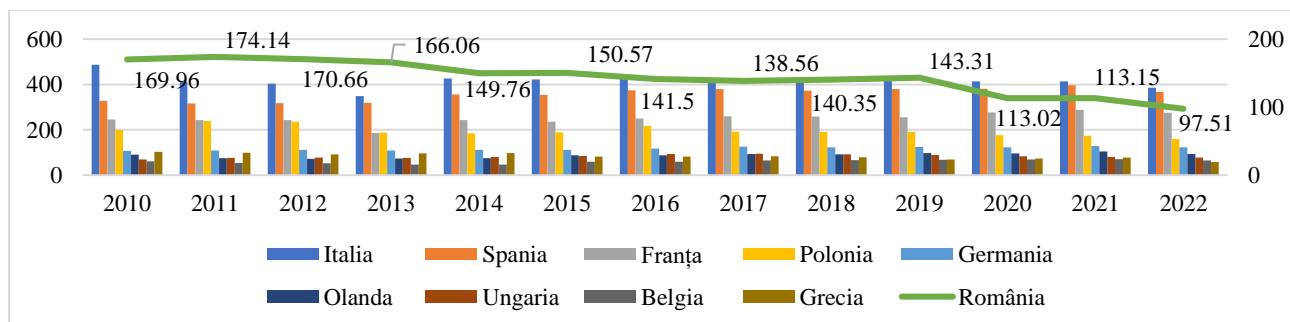


Figure 1. Evolution of areas with vegetables (including melons) in Europe in the period 2010-2022 (1000 ha)

The largest producers of vegetables at the level of the EU countries in 2022 were Spain (24.13% of the total production of vegetables harvested in the EU) and Italy (20.40%). Thus, in 2022, a production of 13.8 million tons was recorded in Spain from an area of 366900 cultivated ha and an average yield of 3.78 kg/m². In second place in the list of the largest producers of vegetables at EU level is Italy with 12.35 million tons on a cultivated area of 385560 hectares and a yield of 3.20 kg/m². In third place is France with a production of 5.92 million tons from 274630 cultivated ha and an average yield of 2.15 kg/m². Romania ranks 10th in the list of vegetable producers with a production of 1.43 million tons obtained from an area of 97510 ha and an average yield of 1.46 kg/m² (Table 2).

Table 2. Evolution of production obtained with vegetables (including melons) in Europe in the period 2010-2022 (1000 t)

	eu	Spain	Italy	France	Poland	Netherlands	Germany	Portugal	Belgium	Greece	Romania
2010	-*	-*	13972.85	6893.63	4278.45	4742.00	3290.70	-*	-*	3921.98	2486.01
2011	-*	-*	13350.52	6102.93	4305.00	-*	3531.62	1976.83	-*	3370.45	2888.11
2012	-*	-*	-*	6211.98	-*	4680.00	3767.81	2125.29	-*	3130.47	2478.56
2013	-*	-*	12108.42	5308.72	-*	4849.00	3356.21	1977.09	-*	3405.85	2712.83
2014	-*	-*	-*	5376.26	5639.30	4918.00	3702.62	2284.20	-*	3175.15	2644.59
2015	62732.17	14123.24	13119.94	5297.41	4823.70	4922.60	3391.73	2214.70	1942.51	3093.16	2491.31
2016	65264.02	15003.61	13313.76	5444.25	5634.31	4833.00	3672.66	2523.39	2012.89	2968.29	2276.89
2017	65864.29	15039.96	12754.54	5549.35	5733.91	5339.04	3952.43	2577.16	2104.80	2794.47	2471.26
2018	62738.67	14533.96	12648.24	5653.68	5284.71	4596.41	3449.76	2111.59	2040.57	2668.73	2614.96
2019	64469.87	15438.91	12778.25	5552.00	5036.00	5327.56	3904.49	2344.62	2221.84	2201.25	2383.53
2020	62652.60	14827.27	13185.73	6033.35	5189.60	5267.01	3887.98	2492.11	2187.90	2450.91	2303.25
2021	66018.04	15927.02	13446.54	6428.82	5285.40	5597.23	4258.58	2929.63	2494.74	2457.37	2323.37
2022	58644.11	13871.09	12348.81	5924.74	5321.70	4782.05	3767.74	2350.64	2189.71	2113.25	1433.27
2022/2021	-11.17	-12.91	-8.16	-7.84	0.69	-14.56	-11.53	-19.76	-12.23	-14.00	-38.31
2022/2010	-	-	-11.62	-14.05	24.38	0.84	14.50	-	-	-46.12	-42.35

Source: Eurostat.eu database, accessed November 2023,* - data not available

At the level of the EU countries, there was a decrease in production recorded in 2022 by 11.2% compared to 2021. This was mainly due to the decrease in cultivated areas, but also in the yield per hectare. At the same time, the period of the Covid-19 pandemic but also the geopolitical instability in Eastern Europe led to an increase in costs in terms of the price of agricultural inputs (phyto-sanitary products for plant protection, fertilizers, electricity, fuels, etc.). According to Eurostat data, Romania's vegetable production fell in 2022 to the lowest level since 2010, registering a decrease of -38.3% compared to 2021 and -42.3% compared to 2010 (Figure 2).

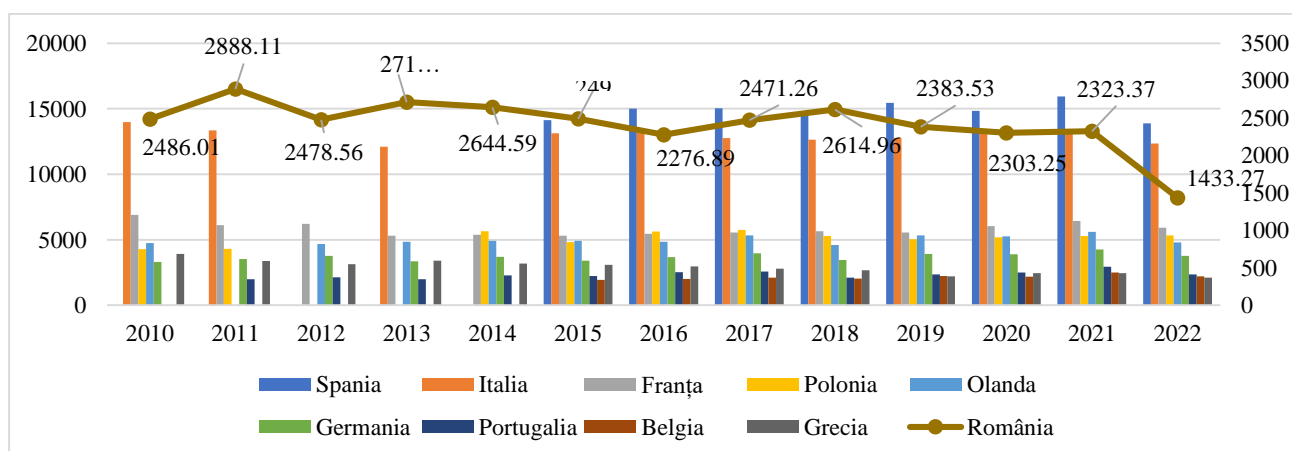


Figure 2. Evolution of productions obtained with vegetables (including melons) in Europe in the period 2010-2022 (1000 t)

II. Average consumption of vegetables

Increasing vegetable intake is an important public health issue and is the subject of nutritional recommendations across Europe. The WHO (World Health Organization) recommends that each person consumes at least 400 g of fruits and vegetables daily. According to the latest consumption monitoring report by Freshfel Europe, the average consumption of fruit and vegetables in the EU increased to 364.6 grams/person/day in 2021, an increase of 2.19% compared to 2020 and 1.27 % above the average of the last 5 years. This increase is due to the change in the lifestyle of Europeans during the COVID-19 pandemic but also to the decision of each individual regarding environmental causes and climate change. This report is based on official statistics from EUROSTAT (trade) and FAOSTAT (production). It can be seen that only 7 EU countries reach the threshold recommended by the World Health Organization of 400 g of fruits and vegetables/day/person (Table 3).

Table 3. Average consumption g/person/day of fresh fruit and vegetables in the EU-27 Member States in the period 2020-2021

EU-27 Member States	Average consumption g/person/day 2020	Average consumption g/person/day 2021	% 2020/2021
Portugal	490.30	539.00	9.93
Belgium	519.55	531.44	2.29
Romania	503.33	525.89	4.48
Greece	486.62	463.21	-4.81
Italy	443.49	431.10	-2.80
Poland	407.29	419.00	2.88
Spain	377.50	416.11	10.23
Netherlands	327.65	366.26	11.78
TOTAL ME	356.77	364.58	2.19
Bulgaria	330.08	362.44	9.80
CYPRUS	329.44	341.55	3.68
France	309.03	323.84	4.79
Austria	326.39	319.34	-2.16
Lithuania	299.12	318.03	6.32
Germany	296.61	288.69	-2.67
Estonia	285.78	285.54	-0.09
Hungary	268.80	285.30	6.14
Malta	245.91	276.75	12.54
Slovenia	349.88	273.76	-21.76
Denmark	258.24	273.09	5.75
Luxembourg	276.89	269.22	-2.77
Lithuania	299.11	265.29	-11.31
Sweden	257.17	253.20	-1.54
Finland	261.22	251.92	-3.56
Croatia	252.12	251.85	-0.11
Czech Republic	247.35	251.26	1.58
Ireland	254.46	249.25	-2.05
Slovakia	218.28	216.08	-1.01

Source: Freshful Europe – Fresh Fruit and vegetable Production, Trade, Supply, and Consumption Monitor in the EU-27, based on statistical data up to 2021, accessed November 2023; <https://freshfel.org/what-we-do/consumption-monitor/>

III. Import and export of vegetables in Romania

In Romania, the situation of vegetable imports and exports shows a significant imbalance. The net higher values of imports compared to export values indicate that Romania has an increased demand for imported vegetables compared to what it manages to export. This situation can have economic and strategic implications, which requires a careful approach and the development of appropriate strategies for each group of vegetables. In this context, the Ministry of Agriculture and Rural Development has decided to grant a minimum aid for the cultivation of certain groups of vegetables, in order to ensure, as far as possible, a year-round market for vegetables produced in

Romania. It can be observed that the value of vegetable imports in Romania increased constantly until 2019. In 2010, the value of vegetable imports was 144 million euros, and in 2022 it reached the level of 632 million euros, representing an increase impressive over 338%. During 2022, according to the TradeMap database, Romania imported vegetables worth 632.2 million euros and exported more than 4 times less, worth 142.6 million euros.

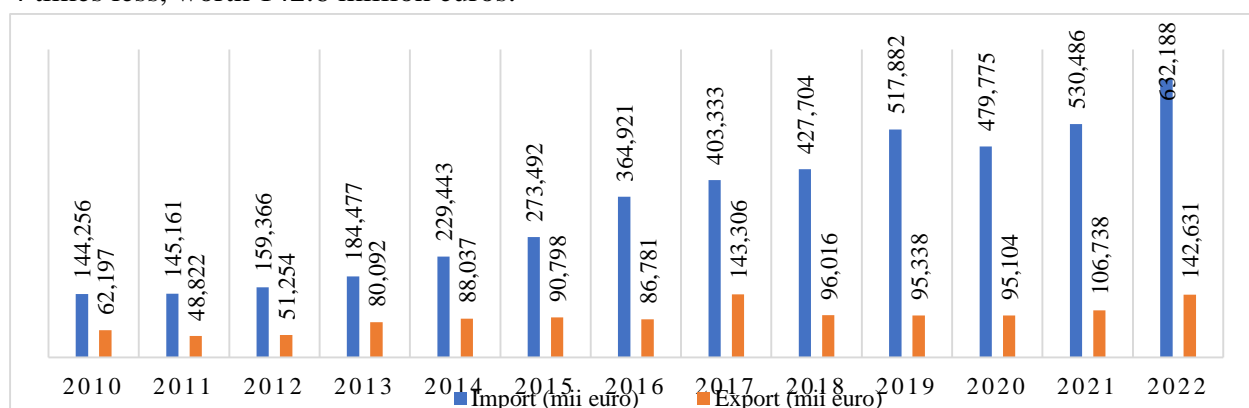


Figure 3. The evolution of the import and export of vegetables in Romania in the period 2010-2022 (thousands of euros)

Source: TradeMap database, accessed October 2023, product code 07

https://www.trademap.org/Bilateral_TS.aspx?nvpm=1%7c642%7c%7c642%7c%7cTOTAL%7c%7c%7c2%7c1%7c1%7c1%7c2%7c1%7c1%7c1%7c1%7c1%7c1

As for the value of exports, it fluctuated between 2010-2022. The fluctuations can be explained by the variations in the total production of vegetables obtained in different periods, which influenced the selling price of vegetables and, implicitly, the volume of exports. In 2010, the value of vegetable exports was 62 million euros, and in 2022 it reached the level of 142 million euros, representing a significant increase of over 129% (Figure 3).

According to the trade data provided by the TradeMap database, the main countries from which Romania imports vegetables are Turkey, from where vegetables worth 134 million euros entered in 2022, the Netherlands (92.4 million euros), Germany (90.8 million euro), Poland (52.8 million euro) and Spain (40.8 million euro) (Table 4).

Table 4 – The main countries from which Romania imported vegetables in the period 2010-2022 (thousands of euros)

	Romania	IMPORT				
		Turkey	Netherlands	Germany	Poland	Spain
2010	144,256	43,539	16,076	6,647	7,622	3,860
2011	145,161	26,370	19,354	11,646	8,045	5,479
2012	159,366	23,578	20,398	13,920	15,060	7,987
2013	184,477	16,570	25,924	14,597	20,754	14,807
2014	229,443	30,252	29,755	14,553	18,772	16,457
2015	273,492	34,306	35,761	24,551	22,904	24,404
2016	364,921	55,478	46,273	34,320	36,551	26,738
2017	403,333	69,380	47,537	41,493	44,366	28,034
2018	427,704	81,127	46,706	46,302	48,476	28,454
2019	517,882	75,916	73,037	62,408	56,258	42,006
2020	479,775	92,225	67,570	58,928	41,626	35,549
2021	530,486	113,442	71,445	70,216	42,563	37,020
2022	632,188	134,119	92,418	90,798	52,785	40,823
2022/2021	19.17	18.23	29.36	29.31	24.02	10.27
2022/2010	338.24	208.04	474.88	1266.00	592.53	957.59

Source: TradeMap database, accessed October 2023, product code 07

https://www.trademap.org/Country_SelProductCountry_TS.aspx?nvpm=1%7c642%7c%7c%7c%7c07%7c%7c%7c2%7c1%7c1%7c1%7c2%7c1%7c2%7c1%7c1%7c1%7c1

Vegetable exports in 2022 are lower in value, with Romania exporting to Italy (66.5 million euros), Germany (13.5 million euros), Poland (11.1 million euros), Ukraine (10.1 million euros) and Hungary 97.8 million euros) (Table 5).

Table 5. The main countries from which Romania exported vegetables in the period 2010-2022 (thousands of euros)

	Romania	EXPORT				
		Italy	Germany	Poland	Ukraine	Hungary
2010	62,197	34,903	5,458	611	0	2,801
2011	48,822	19,345	6,067	306	0	3,984
2012	51,254	22,276	4,880	397	7	5,288
2013	80,092	37,089	7,516	1,823	51	7,401
2014	88,037	40,204	11,550	1,355	0	4,934
2015	90,798	47,063	12,483	1,423	9	3,720
2016	86,781	37,459	10,943	1,761	16	3,364
2017	143,306	50,904	11,265	2,467	29	3,935
2018	96,016	44,859	11,375	3,047	5	4,167
2019	95,338	45,307	10,641	4,418	15	4,285
2020	95,104	48,953	8,387	6,437	832	5,754
2021	106,738	51,026	12,143	9,034	1,043	6,537
2022	142,631	66,512	13,564	11,162	10,158	7,816
2022/2021	33.63	30.35	11.70	23.56	873.92	19.57
2022/2010	129.32	90.56	148.52	1726.84	-	179.04

Source: TradeMap database, accessed October 2023, product code 07

https://www.trademap.org/Country_SelProductCountry_TS.aspx?nvpm=1%7c642%7c%7c%7c%7c07%7c%7c%7c2%7c1%7c1%7c2%7c2%7c1%7c2%7c1%7c1%7c1

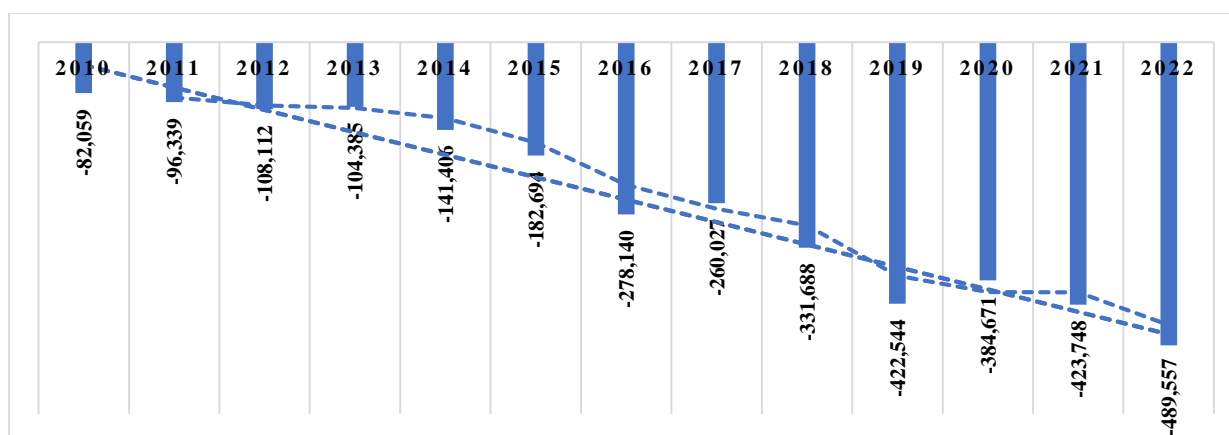


Figure 5. Trade balance with vegetables in Romania in the period 2010-2022 (thousands of euros)

Source: TradeMap database, accessed October 2023, product code 07

Romania's vegetable trade balance deficit increased by 104 million euros in the last 3 years (2020-2022). In 2022, the commercial deficit with vegetables was 489.5 million euros, 15% more than the previous year. (Figure 5).

CONCLUSIONS

According to data provided by Eurostat, the areas with vegetables were reduced by -7.8% in 2022, to 1891.21 thousand hectares (1.2% of the agricultural area used at EU level). Italy (20.39%), Spain (19.4%) and France (14.5%) are in the top of the countries with the largest areas cultivated with vegetables. Romania is in 6th place with a percentage of 5.1% of the area cultivated with vegetables at the EU level. Regarding the productions obtained, 58644.11 thousand tons were harvested at the

EU level in 2022, down by -11.17% compared to the previous year. The main producers of vegetables in 2022 were Spain (24.13% of the total production of vegetables in the EU) and Italy (20.40%). Romania reported a production of 1433.27 thousand tons, respectively 3.52% of the total production obtained at EU level. The Covid-19 pandemic has brought about a change in the behavior of consumers of vegetables and fruits towards basic products. According to the consumption monitoring report by Freshfel Europe, the average consumption of fruit and vegetables in the EU in 2021 increased to 364.6 grams/person/day, 2.19% more than in 2020 and 1.2% above the average of the last 5 years.

According to the TradeMap database, in 2022, vegetable imports in Romania reached an all-time high of 632,188 thousand euros, up 19.2% compared to the previous year and 338% compared to 2010. Exports increased 33.6 compared to of 2021, but they increased by only 129% compared to 2010, to 142,631 thousand euros. The trade deficit in 2022 increased by 15% from 2021 and was 497% above the 2010 level.

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