NARDI FUNDULEA, ROMANIA
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ROMANIAN AGRICULTURAL RESEARCH, NO. 38, 2021
Print ISSN 1222–4227; Online ISSN 2067–5720

STUDY ON THE PRODUCTION AND VALORIZATION OF SUGAR BEET IN THE EUROPEAN UNION

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ABSTRACT

Sugar is an important food in the diet, and ensuring a sufficient production of sugar beet is important for food safety. At the level of the European Union, the sugar industry is a strategic sector, having economic, social and environmental importance being part of the CMO (common organization of the markets) with a safe role for agricultural markets. At the same time, the sugar market in the European Union is one of the best regulated markets and was based on the existence of well-established market shares, pricing and export regulation until 2017. Market shares were eliminated on October 1, 2017, this measure influencing both the situation of production and processing of sugar beet.

In this paper we aim to analyze how the elimination of quotas in 2017 has led to changes at EU level in terms of sugar beet production, but also in terms of raw material and product prices finished, starting from statistical data provided by Eurostat, ITC and the National Institute of Statistics, data that were collected, pre elaborated and analyzed and which were the basis of the study. The conclusions were formulated based on the analysis performed and highlighted the fact that in the European Union the largest producers of sugar beet are countries such as France, Germany, Belgium, the Netherlands and Poland. At the same time, in the European Union there is a strong refining sector that processes both sugar beet produced within the union, but also sugar cane that comes from imports.

Keywords: sugar beet, market shares, production, consumption, price.

INTRODUCTION

The European Union produces the largest amount of sugar beet in the world, it is grown mainly in northern Europe which has a favourable climate for this crop, providing 50% of world demand. Even under these conditions, sugar beet ensures a share of about 14% of world sugar production, the difference being ensured by sugar cane (Voora Vivek et al., 2019; Soleymani Ali et al., 2017). At the same time, the EU is an importer of cane sugar for which duty-free market access is granted to developing countries, in this sense there are economic partnerships with countries in the Pacific, Caribbean or Africa.

At the U.E. level, the market measures involved: aid for storage starting from the reference thresholds, from the average prices and from the production costs; market control measures, which represent additional support when disturbances caused by price fluctuations appear on the market; or support measures in case of specific problems. There are also measures taken through trade policy that is organized at the EU level and not at the national level in terms of agreements that can be concluded in the field of international trade.

As of October 1, 2017 at the U.S. level sugar quotas were abolished, which were introduced in 1968 as one of the first rules of the CAP on sugar and which provide a fair price for producers, which was set at a much higher value than the world market price. The elimination of these quotas offered the possibility to the producers to dimension their productions and to be able to carry out exports, but this led to the increase of competitiveness both among the producers and among the processing units (Szajner et al.,

Received 5 January 2021; accepted 11 January 2021. First Online: January, 2021. DII 2067-5720 RAR 2021-85

2016). Elimination of quotas was established by the European Parliament, as part of the CAP, in the 2013 reform, as one of the key factors in rural development (Franzutti et al., 2020). These changes have resulted in important changes for European players on the European sugar market, given the manifestation of oligopolistic behaviour or competition due to substitute products. Many factories closed, resulting in negative economic and social effects. The closure of sugar beet processing factories as a result of the accumulation of large debts brought additional problems to the producers, who were thus confused with the impossibility of marketing the obtained productions. Since 2018, the directive on the prohibition of the use of neonicotinoids as a measure to protect bees has entered into force in the European Union, which has led to a decrease in yields in the fight against the sugar beet yellowing virus. On the other hand, the rather high value of subsidies granted for this crop, both in the form of coupled support, single area payment, greening payment and transitional national aid (ANT 6), make the cultivation of sugar beet attractive. The level of these subsidies has been maintained for the years 2018-2020, and will be maintained for the year 2021 which represents a year of transition to the new CAP. However, it is estimated that starting with 2022 the value of subsidies will decrease by approximately 40%, which will increase yields and reduce production costs, this requiring the use of high-performance equipment or optimization of technologies, given that production in Romania is below European media. However, the climatic conditions that are below those of other European countries must also be taken into account.

The obligations of the producers for monthly reporting of stocks, production and prices, prices that are notified to the European Commission and which are published annually, in order to ensure the greatest possible transparency of this sector, remain valid. What is reproached by the producers, however, is the fact that this transparency is not ensured in connection with the downstream economic agents.

The measures taken in 2017 aimed at a structured increase in sugar beet production, but also a price cut in the medium term. For the period 2016-2026, the European Commission estimates a sugar price to be below the reference threshold of 404 Euro/to (Official Journal of the European Union, 2017).

However, given that the price of sugar is extremely volatile, it is also correlated with the price of oil, given that an economic cycle is five years, it is necessary to monitor all the influencing factors, so that it can be done a correct analysis that would be the basis of objective decisions for this field of production.

MATERIAL AND METHODS

The working methodology was based on the empirical study both quantitatively and qualitatively, and started from the data taken from the databases of Eurostat, ITC and the National Institute of Statistics. The methods used were documentation, comparison and percentage method. The indicators were the area cultivated with sugar beet, at the level of the EU and Romania, the total production and the average production of sugar beet and the selling prices of sugar beet.

The indicators were analyzed in their dynamics for the period 2010-2019, the results being presented in tables, interpreted and illustrated using graphs.

RESULTS AND DISCUSSION

The role of market shares in the U.S. sugar industry was to ensure a certain stability, in the sense of reducing the competition on this market due to the fact that it was based on a reduction of costs and a concentration towards a group of processors. At the same time, this system also reduced the production of sweeteners, such as is glucose (Szajner et al., 2016). The protectionist trade policy also had the role of limiting imports, also in order to reduce competition. These measures influenced the production of sugar beet until 2017. Starting with October 1, 2017, the elimination of market shares took place, this determining changes both in the field of production and in the processing of sugar beet.

The data collected for the period 2010-2019, shows that the European Union, which is the world's largest producer of sugar obtained from sugar beet. As for the sugar beet producing countries, these are those in areas with a favourable climate for its production, in the central, western and northern part of Europe.

Following the situation of areas cultivated with sugar beet, we find that the average in the European Union fluctuated in the analyzed period, from 1,644.36 thousand ha in 2010, to 1,420.33 thousand ha in 2015, reaching 1,756.47 thousand ha in 2017. In 2018 and 2019 the areas cultivated with sugar beet decreased by 1%, respectively by 6% compared to 2017. The countries that are on the first places in the EU as areas cultivated with sugar beet, and which maintained this position in the period 2010-2019, are France, Germany, Poland and the United Kingdom. They are followed by Serbia, Netherlands, Italy, Belgium and the Czech Republic. Romania, with a cultivated area between 18.82 thousand ha in 2011 and 31.28 thousand ha in 2014 is on the 15th place among the EU countries. In Romania, it is found that cultivated areas decreased by 11% in 2018 compared to 2017 and by 18% in 2019 compared to 2017.

Analyzing the evolution of the obtained productions, we find an increase in it at the level of E.U. of 36% in 2017 compared to 2011. In 2018 and 2019, the decrease of the total production was of 14%, respectively of 16%, I confirm the fact that the elimination of quotas produced changes in the approach of this culture.

Table 1. The evolution of the areas cultivated with sugar beet in the period 2010-2019 at the U.E. level (1000 ha)

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
E.U. 28	*	1,644.36	1,654.09	1,578.20	1,632.44	1,420.33	1,498.69	1,756.47	1,735.65	1,640.58
France	383.76	391.19	382.68	393.63	406.74	385.05	405.23	486.10	485.85	446.60
Germany	364.12	398.10	402.10	357.40	372.50	312.80	334.50	406.70	413.90	408.70
Poland	206.40	203.50	212.00	193.70	197.64	180.10	203.40	231.72	238.92	240.78
United Kingdom	118.00	113.00	120.00	117.00	116.00	90.00	86.00	111.00	114.20	107.80
Serbia	70.97	59.22	69.07	66.53	64.11	42.12	49.00	53.90	48.13	42.54
Netherlands	70.56	73.33	73.00	73.00	75.00	58.43	70.72	85.35	85.20	79.18
Italy	62.67	62.24	45.55	40.71	51.99	38.12	32.30	37.97	34.41	29.97
Belgium	*	62.20	61.20	59.80	58.60	52.35	55.54	62.47	62.70	57.61
Czech Republic	56.39	58.33	61.16	62.40	62.96	57.61	60.74	66.10	64.76	59.21
Austria	44.84	46.58	49.26	50.85	50.60	45.44	43.50	42.68	31.25	27.88
Spain	43.38	44.93	38.95	32.05	38.41	37.61	32.87	36.67	35.30	30.18
Denmark	39.20	40.00	40.80	38.00	38.00	36.00	33.10	34.40	34.30	29.00
Sweden	37.95	39.64	39.00	36.23	34.26	19.38	30.60	30.99	30.64	27.16
Croatia	23.83	21.72	23.50	20.25	21.90	13.88	15.49	19.53	14.07	11.58
Romania	22.03	18.82	27.30	28.14	31.28	26.60	24.92	28.20	25.72	22.73
Switzerland	18.07	19.38	19.28	19.97	21.04	19.75	19.17	19.14	18.58	17.78
Slovakia	17.93	18.10	19.74	20.33	22.21	21.52	21.48	22.38	21.91	21.72
Greece	17.06	5.51	8.05	5.81	7.87	5.18	5.46	6.50	1.43	1.61
Lithuania	15.30	17.60	19.20	17.70	17.00	12.24	15.15	17.15	15.54	14.12
Finland	14.60	14.10	11.50	12.00	13.70	12.40	11.60	11.80	9.80	10.50
Hungary	13.86	15.15	18.72	18.82	15.42	15.51	16.00	18.65	15.77	14.08
Portugal	0.16	0.32	0.37	0.38	0.35	0.10	0.10	0.11	0.00	0.00

Source: own processing according to Eurostat data (Eurostat, 2020).
* missing data.

The European Union is the largest exporter of agro-food products, due to the Common Agricultural Policy.

Analysts believe that eliminating sugar beet producers' quotas will lead to an increase in production and a decrease in the world price of sugar. The increase in production is estimated to take place as a result of the increase in cultivated areas, but also as a result of the increase in yields. In a less optimistic scenario, it is estimated that the cultivated areas will decrease in a first stage, after which, after the stabilization of the market, there will be an increase of the surfaces destined for the cultivation of sugar beet. In support of this culture was intervened with the help received by farmers in the form of subsidies.

In the U.E. there are countries that exceed areas of 100,000 ha cultivated with sugar beet, namely: France, Germany, Poland and the United Kingdom.

Next we will follow what happened in reality, and whether the predictions were correct or not.

The largest productions are registered in France, Germany, United Kingdom, Netherlands and Belgium. At the level of all EU countries a decrease of the areas can be observed after 2017 as a result of the reduction of the cultivated areas. But the biggest decreases were registered in Greece where in 2018 and 2019 it was 87%, respectively 79%, and in Croatia where the decrease of total production was 40% in 2018 and 45% in 2019.

Also, decreases of 28% in 2018, 34% in 2019 and 32% in 2020 took place in Austria and 21% in 2018 and 17% in 2019 and 2020 in Italy.

In Slovakia, however, in the period 2018-2020, production increased by 7% in 2018, by 2% in 2019 and by 7% in 2020.

Table 2. Evolution of production harvested in EU standard humidity (1000 ha)

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
E.U. 28	105,198.62	124,984.17	114,148.49	108,979.00	131,021.77	101,872.08	112,404.99	143,120.73	119,552.68	120,577.63	*
France	31,874.92	37,944.86	33,077.40	33,749.44	37,931.49	33,503.37	34,644.06	46,300.14	39,914.03	38,024.39	30,502.00
Germany	23,431.93	29,577.50	27,686.80	22,828.70	29,748.10	22,572.00	25,497.20	34,059.90	26,191.40	29,728.30	*
Poland	9,972.60	11,674.20	12,349.50	11,234.20	13,488.88	9,364.50	13,523.80	15,732.95	14,302.91	13,836.62	*
United Kingdom	6,527.00	8,504.00	7,291.00	8,430.00	9,310.00	6,218.00	5,687.00	8,919.00	7,620.00	7,450.00	6,690.00
Serbia	3,551.07	3,004.24	2,482.96	3,180.01	3,507.44	2,183.19	2,683.86	2,513.50	2,325.30	2,305.32	2,062.22
Netherlands	5,280.43	5,858.00	5,735.00	5,727.00	6,822.00	4,868.26	5,502.20	7,959.27	6,506.31	6,644.71	6,749.70
Italy	3,550.07	3,547.95	2,501.16	2,159.38	3,784.44	2,183.88	2,046.30	2,453.57	1,941.48	1,779.13	1,779.13
Belgium	4,464.80	5,408.98	4,830.40	4,809.30	5,162.11	4,453.63	4,023.59	5,941.78	5,192.05	5,071.85	4,837.70
Czech Republic	3,064.99	3,898.89	3,868.83	3,743.77	4,424.62	3,421.04	4,118.36	4,399.52	3,724.31	3,661.42	3,793.09
Austria	3,131.67	3,456.23	3,114.43	3,465.79	4,244.22	2,853.28	3,534.42	2,993.71	2,150.19	1,965.15	2,048.44
Spain	3,534.52	4,188.54	3,460.23	2,519.48	3,723.31	3,605.11	3,014.36	3,292.75	2,870.91	2,752.71	2,451.59
Denmark	2,356.40	2,700.40	2,648.90	1,993.60	2,266.10	2,429.00	2,350.40	2,454.60	2,107.60	2,339.90	2,368.87
Sweden	1,976.20	2,493.20	2,314.20	2,326.20	2,517.80	1,178.30	1,988.00	1,963.50	1,698.40	2,028.90	2,101.90
Croatia	1,249.15	1,168.02	919.23	1,050.72	1,392.00	756.51	1,169.62	1,295.46	776.49	708.58	700.00
Romania	837.90	660.50	719.79	1,029.21	1,398.57	1,040.83	1,012.19	1,174.50	978.27	917.16	873.43
Switzerland	1,302.06	1,828.18	1,697.82	1,337.25	1,924.26	1,357.72	1,278.85	1,544.78	1,263.46	1,564.55	1,420.00
Slovakia	977.69	1,160.70	894.46	1,144.60	1,550.22	1,205.45	1,506.94	1,230.79	1,311.97	1,251.67	1,321.80
Greece	896.46	324.40	434.86	340.40	537.14	275.72	293.07	383.99	64.27	79.37	*
Lithuania	706.70	877.80	1,003.00	967.10	1,014.40	619.48	933.51	956.95	888.62	1,001.61	875.80
Finland	542.10	675.70	398.70	459.50	626.30	406.50	433.60	430.30	355.40	501.40	461.40
Hungary	818.94	856.37	881.72	990.72	1,066.75	910.92	1,121.25	1,171.50	958.08	823.50	768.34
Portugal	4.16	7.96	18.89	9.89	13.32	5.76	5.13	6.55	0.00	0.00	0.00

Source: own processing according to Eurostat data (Eurostat, 2020).
* missing data.

The situation of the United Kingdome is a particular one, accounting for 5% of the cultivated area in the Union and 8% of the sugar trade. From the obtained production is ensured 50% of the consumption needs, so that the needs are ensured from imports. France is the main country in the U.E. which contributes to ensuring the consumption needs of the English (Bălan and Zamsa, 2018).

Regarding the average production obtained in Romania, for sugar beet, for the period 2010-2019, it is found that the highest value was recorded in 2014 when it was 45 to/ha. Compared to 2010, in 2019 the average production increased by 8%. Romania's average production represents approximately 54% of the average production obtained in the EU, providing 30% of domestic consumption.

The highest total production was also recorded in 2014 when it was 1,399 thousand tons. What can be seen is that in the conditions of an increase in average production in 2019, total production decreased to 945.2 thousand tons, which shows a decrease in areas cultivated with sugar beet due to the fact that the elimination of quotas led an increase in competition and competitiveness that led to the closure of sugar beet processing factories causing farmers to reduce cultivated areas. The importance of sugar beet cultivation is given by the role that obtaining optimal productions has on the sugar production obtained at national level (Soare and Chiurciu, 2016).

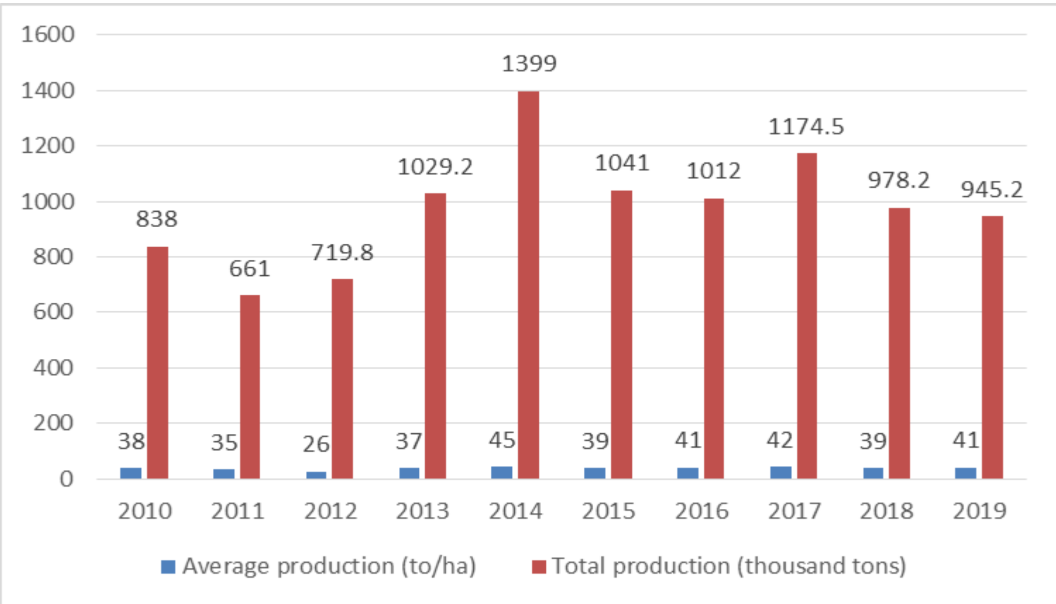

Figure 1. Average production and total sugar beet production in Romania (Source: own processing, INS, 2020)

The analysis of the evolution of sales prices was made on the basis of data published at the level of EU countries. We find that they vary between 61 unit value in 2013 in the Netherlands and 23.4 unit value in 2018 in Denmark. The way in which these prices fluctuated during the analyzed period, in the main sugar beet producing countries in the EU countries are shown in Table 3.

For 2020, although the world price of sugar has fallen as a result of falling oil prices or the fall in the real exchange rate (Brazil) against the dollar, prices in the European Union have risen as a result of the drought which has affected production, which led to a decrease in supply and the perpetuation of the existing deficit phenomenon on the European market.

Table 3. Evolution of selling prices of sugar beet (unit value)

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
France	24.87	24.55	29.98	27.17	27.2	27.20	24.50	*	*	*
Germany	*	*	*	*	*	*	*	29.00	26.00	28.00
Poland	28.31	34.95	32.78	35.44	30.1	28.56	26.72	22.46	24.70	24.83
United Kingdom	*	*	*	*	*	*	33.64	30.00	31.86	31.81
Netherlands	43.00	45.00	60	61	50.12	38.26	35.68	42.81	34.96	34.76
Belgium	29.26	30.73	28.68	29.26	26.34	26.34	29.91	22.12	22.99	21.97
Czech Republic	28.08	28.63	32.29	31.76	29.71	31.23	31.52	30.54	31.97	27.00
Austria	28.78	37.77	40.57	35.18	23.18	26.82	27.88	28.63	25.17	28.50
Spain	32.70	28.10	31.40	30.9	32.90	35.00	36.90	37.60	32.10	28.80
Denmark	36.42	38.02	43.43	44.22	43.86	36.08	32.90	27.70	23.40	28.40
Sweden	25.69	26.69	25.73	26.58	27.11	26.45	26.90	26.43	27.88	29.80
Croatia	*	39.81	39.29	39.19	24.28	27.75	34.76	37.03	27.24	27.47
Romania	28.49	40.10	38.12	38.47	36.01	35.99	28.95	28.45	27.93	29.50
Slovakia	36.37	36.13	36.7	40.09	37.07	32.61	27.70	25.08	25.70	25.50
Greece	22.86	28.98	26.86	31.11	25.68	26.32	26.38	25.92	26.41	26.41
Lithuania	33.33	33.91	35.35	37.31	34.13	30.41	29.96	27.00	*	*
Finland	32.09	26.76	34.9	41.78	41	31.06	33.92	*	*	*

Source: own processing according to Eurostat data (Eurostat, 2020).
* missing data.

The data show that the highest prices for sugar beet were recorded in the Netherlands, followed by Denmark, Romania, Spain and Slovakia in 2010-2019, while the lowest prices were recorded in countries such as France and Finland.

The countries where there were price increases after 2017 were Poland, United Kingdoms, Czech Republic, Sweden and Greece. In countries such as the Netherlands, Spain and Croatia prices have fallen, but there are also countries where there have been no major changes (Belgium and Slovakia).

The average price, at the EU level, for 2019 was 23.2 €/ton, decreasing by 10% compared to the period 2016-2017 (European Commission, 2020).

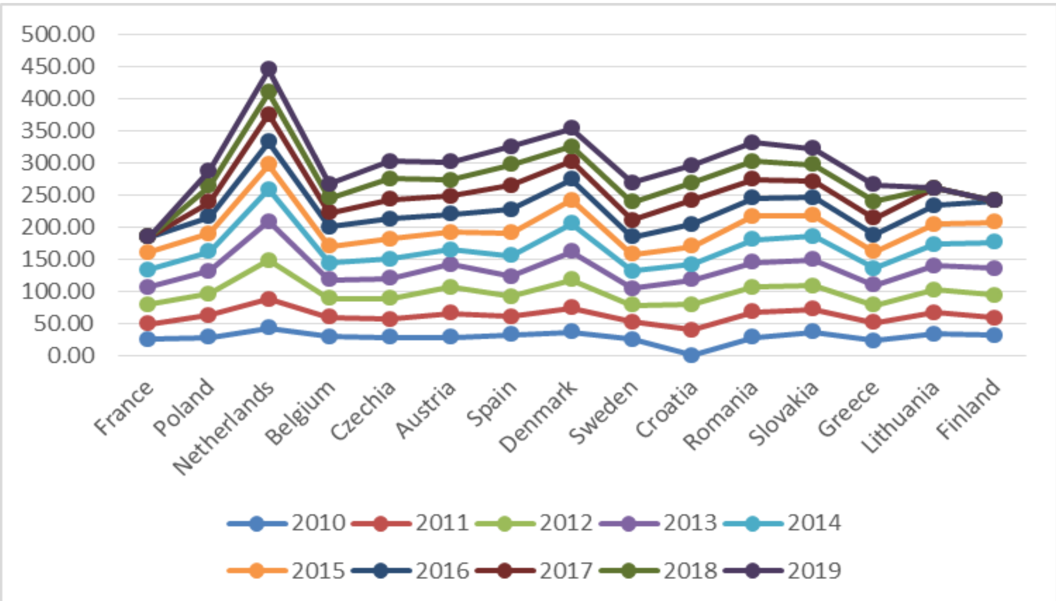

Figure 2. Evolution of selling prices of sugar beet in 2010-2019 period
(Source: own processing, Eurostat, 2020)

In 2018, sugar futures quotations were the lowest compared to the last ten years, due to the over-supplied world market, which resulted in a reduction in cultivated areas. By following this directive, the world's existing production surplus could eventually turn into a decimation.

At the level of Romania, an oscillation of the average selling price can be observed in the analyzed period. It is sung that the best prices were obtained in the period 2011-2013. From 2016-2018 the price was 0.13 lei/kg. Therefore, after 2017, there were no significant changes related to the sale price.

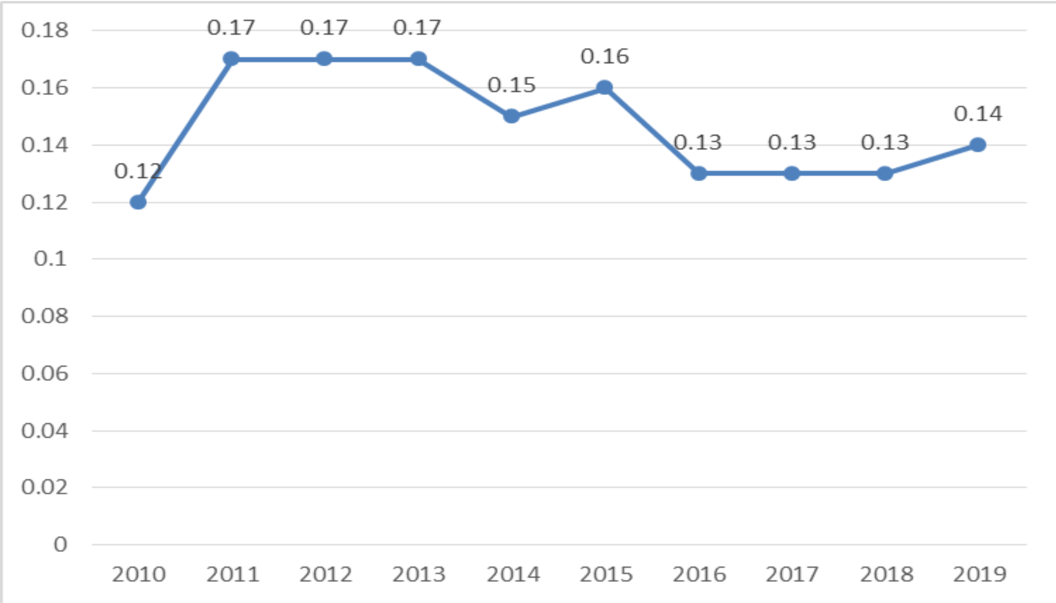

Figure 3. Evolution of average selling price of sugar beet in 2010-2019 period in Romania (lei/kg) (Source: own processing, INS, 2020)

The U.E. at the level there are about 137,000 sugar beet growers that are mainly processed and processed into sugar, but also have other destinations, such as animal feed, organic products or ethanol, which can be used in case of overproduction. The importance of the sugar market is undeniable, and the cultivation of sugar beet is one that contributes to environmental conservation and increased sustainability (Ullah et al., 2017).

At 2020, the emergence of the COVID crisis, although it did not have a very large effect on agricultural production compared to other sectors of the economy, still had some difficulties related to the supply chain and the labor crisis for some regions of the European Union. Or ensuring the supply chain is an important aspect in increasing the efficiency of a company, providing added value (Mărcuţă and Mărcuţă, 2013). But there were also certain sectors, which were more severely affected. The forecasts show a 3% decrease in cultivated areas for the period 2020-2021 as a result of the decrease in prices in 2018 and 2019 (European Commission, spring, 2020), as we saw in the analysis. Losses in the sugar beet sector are estimated at 1.6 billion euros for the next season (European Commission, 2020), due not only to falling prices, but also to drought and pest infestation.

CONCLUSIONS

Sugar beet is a crop that helps preserve the soil, ensure fertility, reduce pests and soil pathogens due to the fact that it is grown in rotation with other crops, so from an ecological point of view it is a sustainable crop.

U.E. policy to elimination of production quotas, as well as the minimum purchase price led to changes in the market in this sector. Although between 2006-2010 there were important changes in this market, which led to increased productivity, but also to the adaptation of producers to commercial opportunities, 2017 meant a turning point that marked an adaptation of the Common Agricultural Policy to the market. The application of this measure allowed the entry of sugar cane sugar into the European market, which in turn represents a competition for European producers.

The United Kingdom's exit from the U.E. as a result of Brexit, it also has an impact on the sugar market, given that the United Kingdom is one of the important players in this market, therefore, at the U.E. level.

In Romania, the reduction of areas cultivated with sugar beet was due to low existence of irrigation systems, unfavorable climatic conditions in recent years, the fact that only since 2002 sugar beet has been considered a crop of national importance. As we can see, the closure of some of the few sugar beet processing plants has led to discouragement of farmers and a decrease in interest in this important crop for the country's economy. The Mercosur agreement also helped increase pressure on the sugar market, in turn contributing to the closure of these factories.

Although the sugar beet crop is one that involves high costs, which involves the use of a complex technology, it is still one of the most profitable crops, taking into account the values of subsidies granted. Moreover, the cultivation of varieties that are suitable for obtaining biofuels can be an opportunity for farmers.

Some measures should be taken to help stabilize the sugar beet market. Thus, price volatility must be doubled by adequate risk management to support the cultivation of sugar beet and ensure stable production in the EU. Granting direct payments to farmers to help stabilize their incomes, as well as forms of support due to the fact that, as we show the sugar beet crop is an organic crop, could be forms of ways to intervene for helping producers. Also, consolidating their position in relation to the processing entities, monitoring their activity, as well as until 2017 or following the situation of exports and imports made at EU level are measures that can help reduce the risks in the sugar beet production sector.

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