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RAPESEED OFFER OF OLT COUNTY, IN NATIONAL AND REGIONAL CONTEXT (2008 – 2016)

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Abstract

Due to its characteristics, Olt County has a high potential for agricultural activity. Starting from this, adding the regional framework of existence, the paper presents the rapeseed offer in the context in which this culture is currently an extension. Regarding the cultivated area, the following aspects were highlighted: at national level, the indicator variation of amplitude was 432,035 ha (4.10 times for the minimum level of indicator, 19.60% decrease when is compared to the maximum level for the indicator); there is a variation of amplitude at regional level of 48.306 ha, which was a increase of 3.20 times the minimum level (2013), and a decrease of 23.81% when we compare to the maximum level (2010), at the county level the variation amplitude of the surface area was 23,904 ha, which exceeded the minimum level of indicator (2012) by 3.56 times and was 21.92% lower than the maximum level (2010). Regarding total rapeseed production, there is a national variation amplitude of 1,135,268 t, which exceeded 7.21 times the minimum (2012) and was lower by 12.19% of the maximum term (2016); at regional level, the variation amplitude was 91,440 t, which exceeded 4.71 times the minimum term (2013) and was lower 17.33% with the maximum level (2016); at the county level: the recorded amplitude reached 41,675 t, which exceeded the 4.46 times the minimum term (2012) and was lower than the maximum term (2010) by 18.34%. If we refer to the average production yield per unit of production (kg / ha), the following conclusions can be drawn: at national level, the variation amplitude was 1,478 kg / ha, which exceeded 1.09 times the minimum (2009) was lower than the maximum term (2016) by 47.87%; at regional level the indicator has a variation amplitude of 1,415 kg / ha, which exceeded the minimum period (2013) of 1.11 times and was lower compared to the maximum period (2016) by 47.30%; at the county level, the amplitude of variation of the indicator was 1,255 kg / ha, which was lower than both the minimum (2013) and the maximum (2016) with 0.87 and 50.22%. Olt County represents a decisive producer of rapeseed for the Region South West Oltenia, by the weights held at the cultivated area level (47.63%) and the total production (46.44%). The decrease in the share for total production compared to the cultivated area at regional level, is explained by lower average yield per hectare for the county with 0.33% compared to the regional one.

***Key words*:** *rapeseed, offer, average production, total production, area*

INTRODUCTION

Rapeseed (Colza or Autumn Rapeseed) is at the time, one of the most important oleic species worldwide, growing for 42-48% oil-rich seeds, oil used in human food, margarine and in industry [9]. The functional properties of rapeseed protein isolate (RPI) has limited its utilization by the food industry [6].

Autumn rapeseed for oil is important as industrial raw material, food, animal feed and agro-technologically [2]. It can be shown that from a tone of rapeseed, 42% is used for oil production, and 56% for the production of fodder used in the feeding of various species (cattle, pigs, poultry). Rape oil has the iodine index 94-112 and can be used in the textile, leather, plastic, lacquer, paints, inks, detergents, printing, lighting or lubricating oils, paint oil, candles, in the manufacture of antifouling agents, as an adjuvant to pesticides, as hydraulic fluids. The fortified rapeseed oils revealed higher antioxidant capacity and an increase in oxidative stability in comparison with the refined rapeseed oil [7].

By its specificity, rapeseed is part of the oleaginous plant line, which is based on the production of raw materials made from

sunflower, soybean, oil rapeseed and castor oil [8].

The rapeseed is a plant specific to the temperate climate with mild winters, cool and humid summers, being one of the world's most important species plant for oil, cultivated for its oil rich seeds [3].

For increasing rapeseed economic yield in farmer's fields, it needs to promote their technical knowledge about crop management too [1]. Floral bud number determines seed yield potential of rapeseed [4].

The variation in annual yields for agricultural crops and livestock production leads to a variable agricultural products supply.

In the long run, the supply of agricultural products is relatively stable, depending on the volume of annual agricultural produce, the level of stocks accumulated over time, the impact of agricultural policies etc.

So, the supply depends on production, and has different relation to demand depending on a number of conditions and particularities of agricultural products, depending on the level of solvency of the demand, the psychological factors etc.

MATERIALS AND METHODS

For the conventional work there were used classical economic indicators, cultivated area (ha), total production (t) and average yield (kg / ha). These indicators are presented for three reference levels: national level (Romania), regional level (South West Oltenia Region), county level (Olt County). Based on this, the comparison (%) between the three levels was achieved: the regional one compared to the national one, the county one with the regional ones. The dynamic series analyzed consists of nine terms, i.e. the time period between 2008 and 2016. The method of analysis used was the comparison. This method, appreciates the results of an agricultural holding, and compares them with the reference bases that can be called. The comparison can be made in time, in space, or it can be a mixed one [5].

RESULTS AND DISCUSSIONS

Table 1 shows the data on the evolution of the areas planted with rapeseed during the period 2008-2016 [10].

Table 1. Cultivated area (ha)

Year	National level		South West Oltenia region			County Olt		
	Eff.*	Dynamic Ibm**	Eff.*	Dynamic Ibm**	% compared to the national level	Eff.*	Dynamic Ibm**	% compared to the regional level
2008	364,978	100	32,939	100	9.02	16,559	100	50.27
2009	419,900	115.05	35,594	108.06	8.47	19,254	116.28	54.09
2010	537,330	127.97	63,395	178.11	11.79	30,613	158.99	48.29
2011	392,668	73.08	36,227	57.14	9.23	14,143	46.20	39.04
2012	105,295	26.82	15,539	42.89	14.76	6,709	47.44	43.18
2013	276,596	262.69	15,089	97.10	5.46	8,730	130.12	57.86
2014	406,705	147.04	21,414	141.92	5.27	11,072	126.83	51.70
2015	367,885	90.46	31,625	147.68	8.59	15,153	136.86	47.91
2016	455,953	123.94	41,187	130.24	9.03	17,325	114.33	42.06

Source: *http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind=AGR108A (20.112017)
** own calculation.

At national level, the area planted with rapeseed ranged from 105,295 ha in 2012 to 537,330 ha in 2010. From the surface point of view, the years can be grouped as follows: with areas up to 300,000 ha - 2012 and 2013 (276,596 ha); with areas ranging from 300,001 to 400,000 ha - 2008 (364,978 ha), 2015 (367,885 ha) and 2011 (392,668 ha); with areas over 400,000 ha - 2014 (406,705 ha), 2009 (419,900 ha), 2016 (455,953 ha) and 2010 (537,330 ha). The evolution over time of the indicator was uneven, characterized by increases from 2008 to 2010 (+15.05 and + 27.97% compared to the terms

of comparison), decreases in 2011 and 2012 (-26.92 and -73.18%), increases in 2013 and 2014 (+162.69 and + 47.04%), decreases in 2015 (-9.54%) and increases in 2016 (+ 23.94%).

For the South West Oltenia Region, the cultivated area recorded an extreme of 15,089 and 63,395 ha for the years 2013 and 2010. There are years when the indicator did not exceed 25,000 ha (2012 - 15,539 ha and 2014 - 21,414 ha), and years with surface levels from 25,001 to 45,000 ha (2015 - 31,625 ha, 2008 - 32,939 ha, 2009 - 35,594 ha, 2011 - 36,227 ha and 2016 - 41,187 ha).

If we refer to the evolution of the indicator, for the period 2008-2016, its non-uniform trend is observed.

After a two-year period (2009 and 2010), when the indicator is overtaking the reporting bases (1.08 and 1.78 times respectively), there is a three-year period in which it decreases (2011-2013, decreases by 42.86, 57.11 and 2.90 % compared to the terms of reference), then three years in which the trend is upward (2014-2016, 41.92, 47.68 and 30.24% exceedance levels).

Olt County is characterized by variations in the area from 6,709 ha in 2012 to 30,613 ha in 2010. Only in 2013, under 10,000 ha (8,730 ha) were cultivated, and for the rest of the years the dynamic series indicator was between 10,001 and 20,000 ha as follows: 11,072 ha in 2014, 14,143 ha in 2011, 15,153 ha in 2015, 16,559 ha in 2008, 17,325 ha in 2016 and 19,254 ha in 2009.

As a result of the state of affairs, it can be estimated that the evolution of the indicator was fluctuating: increases in 2009 and 2010 by 16.28 and 58.99% compared to the comparison term, decreases for 2011 and 2012 (-53.80 and -52.56% respectively) increases from 2013 to 2016 (outturns of 1.30, 1.26, 1.36 and 1.14 respectively of the bases of comparison).

The region cultivated between 5.27 and 14.76% of the surface area of rapeseed at national level (2014 and 2012 respectively). For the rest of the dynamic series, there is still a level comparable to 2014 (5.46% in 2013) and a level that shows a share higher than 10% (2010 - 11.79%).

The other terms of the dynamic series ranged from 6% to 10% as follows: 8.47% in 2009, 8.59% in 2015, 9.02% in 2008, 9.03% in 2016, 9.23% in 2011 (Figure 1). For Olt County, fluctuating contributions are as follows: below 40% for 2011 (39.04%), between 40 and 50% for 2016, 2012, 2015 and 2010 (42.06, 43.18, 47.91 and 48.29% respectively), over 50% in the years 2008, 2014, 2009 and 2013 (50.27, 51.70, 54.09 and 57.86%, respectively - Figure 1).

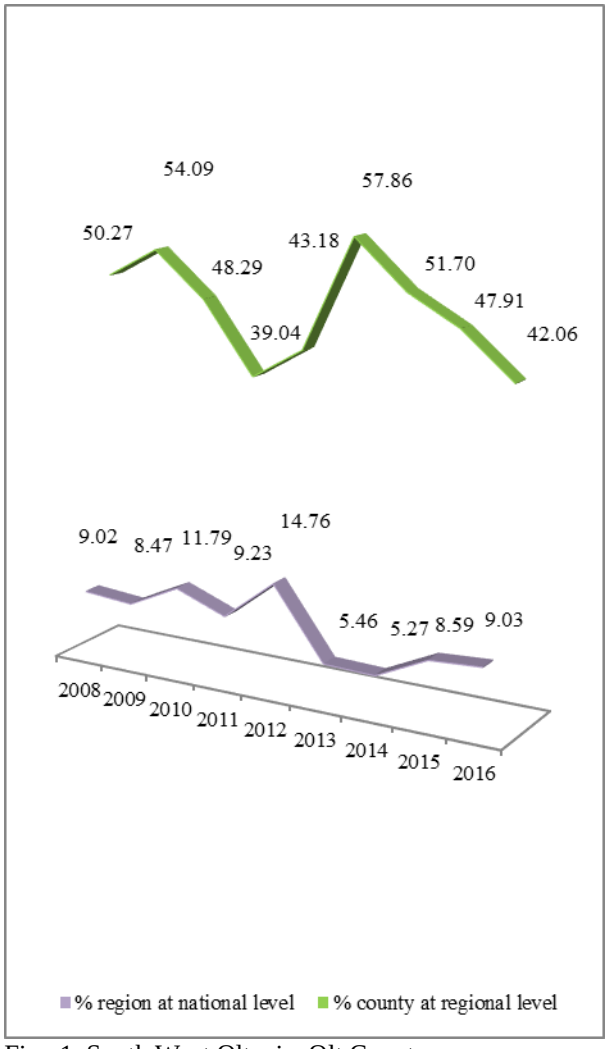

Fig. 1. South West Oltenia, Olt County
- weights within the national and regional area (%)
Source: Own calculation and design.

The data for total production are presented in Table 2 [10].

Total rapeseed production in Romania ranged between 157,511 t in 2012 and 1,292,779 t in 2016.

Table 2. Total production (t)

Year	National level		South West Oltenia region			County Olt		
	Eff.*	Dynamic Ibm**	Eff.*	Dynamic Ibm**	% compared to the national level	Eff.*	Dynamic Ibm**	% compared to the regional level
2008	673,033	100	59,539	100	8.85	27,429	100	46.07
2009	569,611	84.63	50,568	84.93	8.87	25,064	91.38	49.56
2010	943,033	165.56	109,138	215.82	11.57	51,029	203.59	46.76
2011	738,971	78.36	60,912	55.81	8.24	27,113	53.13	44.51
2012	157,511	21.31	20,303	33.33	12.89	9,354	34.50	46.07
2013	666,097	422.89	19,156	94.35	2.87	11,049	118.12	57.68
2014	1,059,121	159.00	51,502	268.86	4.86	27,826	251.84	54.03
2015	919,473	86.81	73,621	142.95	8.01	35,379	127.14	48.06
2016	1,292,779	140.60	110,596	150.22	8.55	43,681	123.47	39.49

Source: *http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind=AGR109A (20.112017)
** own calculation

For the rest of the dynamic series, the following positions were recorded: between 500,000 and 700,000 tons: 2009, 2013 and 2008 (569,611, 666,097 and 673,033 t respectively); from 700,001 to 1,000,000 t: 2011, 2015 and 2010 (738,971, 919,473 and 943,033 t respectively); over 1,000,000 t - 2014 (1,059,121 t). If we refer to the dynamics of the indicator, we see the alternation of the periods of decrease and increase of total production as follows: -15.37% in 2009, + 65.56% in 2010, -21.64% in 2011, -78.69% in 2012, + 322.89% in 2013, + 59.0% in 2014, -13.19% in 2015 and + 40.60% in 2016.

At regional level, the total yield of rapeseed ranged from 19,156 t in 2013 to 110,596 t in the year 2016. With regard to the situation specific to the other terms of the dynamic series, the following positions are found: from 20,000 to 61,000 t in the years 2012, 2009, 2014, 2008 and 2011 (20,303, 50,568, 51,502, 59,539 and 60,912 t respectively); over 73,000 t in the years 2015 and 2010 (73,621 and 109,138 t respectively). If we analyze the dynamics of the indicator, we can observe its fluctuating evolution, with declining or increase compared to the reference period: 2009, 2011, 2012 and 2013 (-15.07, -44.19, -66.67 and -5.65% respectively); 2010, 2014, 2015, and 2016 (2.15, 2.68, 1.42, and 1.50 times).

For Olt County, total rapeseed production had variable levels ranging from 9,354 tons in 2012 to 51,029 tons in 2010. For the other component sequences of the dynamic series, positions are as follows: below 20,000 t - 2013 (11,049 t); between 20,000 and 30,000 t for 2009, 2011, 2008 and 2014 respectively (25,064, 27,113, 27,429 and 27,826 t); from 30,001 to 44,000 t in the years 2015 and 2016 (35,379 and 43,681 t, respectively). The dynamics of total rapeseed production in Olt County is characterized by a fluctuating evolution. In this respect, it is noteworthy: the 2009 decrease (-8.62% compared to the previous term of the dynamic series), the increase for 2010 (2.03 times the reporting base), the downward trend of 2011 and 2012 (-42.87 and -65.50% compared to the terms of reference), the growth period of 2013, 2014, 2015 and 2016 (+18.12, +151.84, +27.14 and + 23.47% respectively).

Regarding the regional and county contributions to the national and regional level of the indicator (Figure 2) it can be seen that: at national level, the region had variable contributions (weights): below 5% for the years 2013 and 2014 (2.87% respectively, between 5% and 10% (2015, 2011, 2016, 2008 and 2009 - 8.01, 8.24, 8.55, 8.85 and 8.87% respectively), over 10% (2010 and 2012 - 11.57 and 12.89%, respectively) ; at regional level, the county is registered with variable contributions (contributions) as follows: below 40% in 2016 (39.49%), between 40 and 50% in 2011, 2008, 2010, 2015 and 2009 (44.51, 46.07, 46.76, 48.06)

and 49.56% respectively), over 50% in 2014 and 2013 (54.03 and 57.68% respectively).

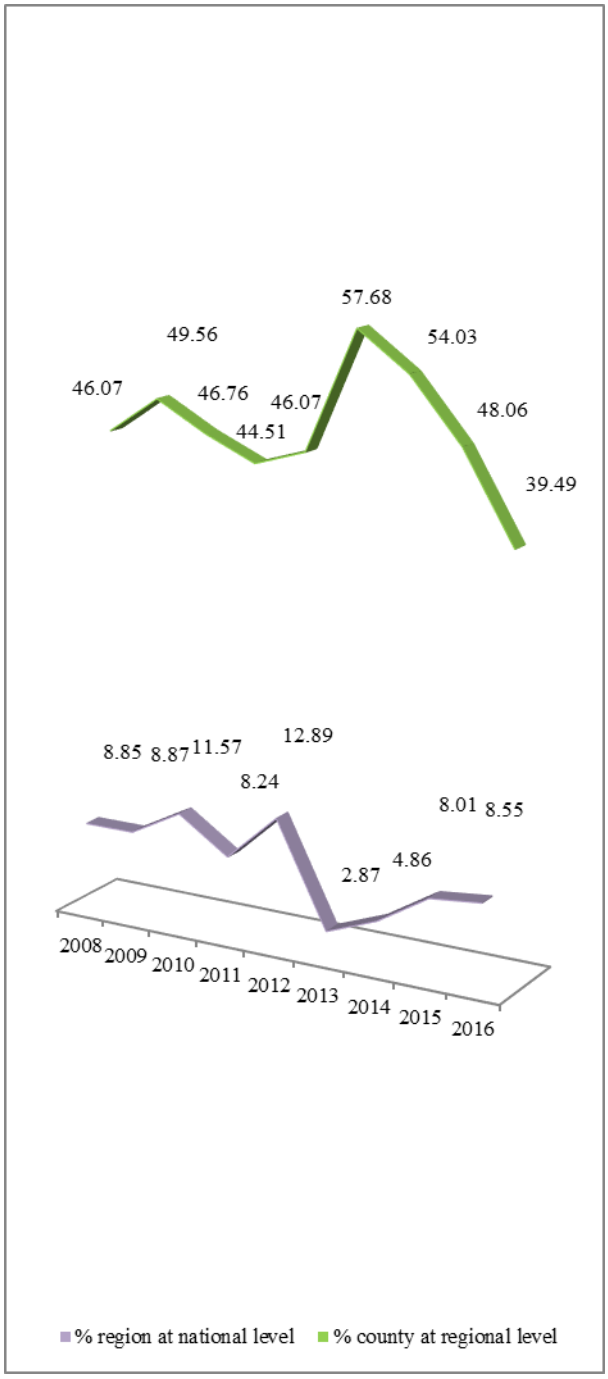

Fig. 2. South West Oltenia Region, Olt County - shares in total national or regional production (%)
Source: Own calculation and design.

Table 3 shows the specific situation for the average production [10].

In the case of Romania, the average yield was between 1,357 kg / ha (2009) and 2,835 kg / ha (2016). The rest of the dynamic series components were positioned below 2,000 kg / ha in the years 2012, 2010, 2008 and 2011 (1,496, 1,755, 1,844 and 1,882 kg / ha); over 2,000 kg / ha - 2013, 2015 and 2014 (2,408, 2,499 and 2,604 kg / ha respectively). Analyzing the dynamics of the indicator, there are decreases compared to the terms of comparison in 2015, 2012 and 2009 (-4.03, -20.51 and -26.41% respectively), and their exceedances in 2011, 2014, 2016, 2010 and 2013 (1.07, 1.08, 1.13, 1.29 and 1.60 times respectively).

For the South West Oltenia Region, average production varied from 1,270 kg / ha in 2013 to 2,685 kg / ha in 2016 years. Between these limits, the terms of the dynamic series were positioned as below: 2,000 kg / ha in 2012, 2009, 2011, 2010 and 2008 (1,307, 1,421, 1,608, 1,722 and 1,808 kg / ha respectively); over 2,000 kg / ha in 2015 and 2014 (2,328 and 2,405 kg / ha respectively). The evolution of average production for 2008-2016 is characterized by decreases in 2009 compared to 2008 (-21.49%), increases in 2010 (+21.18%), decreases for 2011, 2012 and 2013 (-2.38, -22.25 and -2.83%), followed by an increase of 89.37% in 2014 compared to 2013, a decrease of 20% in 2015 by 3.20% compared to the previous term, and finally by 2016 a 15.34% increase compared to the year - 2015.

Analyzing the average production of Olt County, the fluctuation limits of 1,266 and 2,521 kg / ha are established for the years 2013 and 2016 respectively. Above 2,000 kg / ha is 2015 and 2014 (2,335 and 2,513 kg / ha respectively). Less than 2,000 kg / ha are: 2009, 2012, 2008, 2010 and 2011 (1,302, 1,394, 1,656, 1,667 and 1,917 kg / ha respectively). The dynamics of the indicator is characterized by uneven evolutions, decreasing in 2009 compared to 2008 (-21.38%), increases in 2010 and 2011 (+28.03 and + 14.99%), decreases in 2012 and 2013 (-27.28 and -9.18%), an increase in 2014 (+ 98.50%), a decrease for 2015 (-7.08%) and an increase for the year 2016 (+ 7.97% compared to the year 2015).

The positioning of the regional average production levels compared to the national situation reveals subunit levels for most of the years of the dynamic series (2008, 2010, 2011, 2012, 2013, 2014, 2015 and 2016 -

98.05, 98.12, 89.32, 87.37, 52.74, 92.36, 93.16 and 94.71%, respectively) except for 2009 (1.04 times the comparison base - Figure 3).

Table 3. Average yield (kg/ha)

Year	National level		South West Oltenia region			County Olt		
	Eff.*	Dynamic Ibm**	Eff.*	Dynamic Ibm**	% compared to the national level	Eff.*	Dynamic Ibm**	% compared to the regional level
2008	1,844	100	1,808	100	98.05	1,656	100	91.59
2009	1,357	73.59	1,421	78.59	104.72	1,302	78.62	91.63
2010	1,755	129.33	1,722	121.18	98.12	1,667	128.03	96.81
2011	1,882	107.24	1,681	97.62	89.32	1,917	114.99	114.04
2012	1,496	79.49	1,307	77.75	87.37	1,394	72.72	106.66
2013	2,408	160.96	1,270	97.17	52.74	1,266	90.82	99.69
2014	2,604	108.14	2,405	189.37	92.36	2,513	198.50	104.49
2015	2,499	95.97	2,328	96.80	93.16	2,335	92.92	100.30
2016	2,835	113.44	2,685	115.34	94.71	2,521	107.97	93.89

Source: *http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind=AGR110A (20.112017)
** own calculation

Olt County exceeded the reference period (the regional level of the indicator) for the years 2015, 2014, 2012 and 2011 (+0.30, +4.49, +6.66 and 14.04%, respectively) but did not reach this for the years 2008, 2009, 2010, 2013 and 2016 (-8.41, -8.37, -3.19, -0.31 and -6.11% respectively).

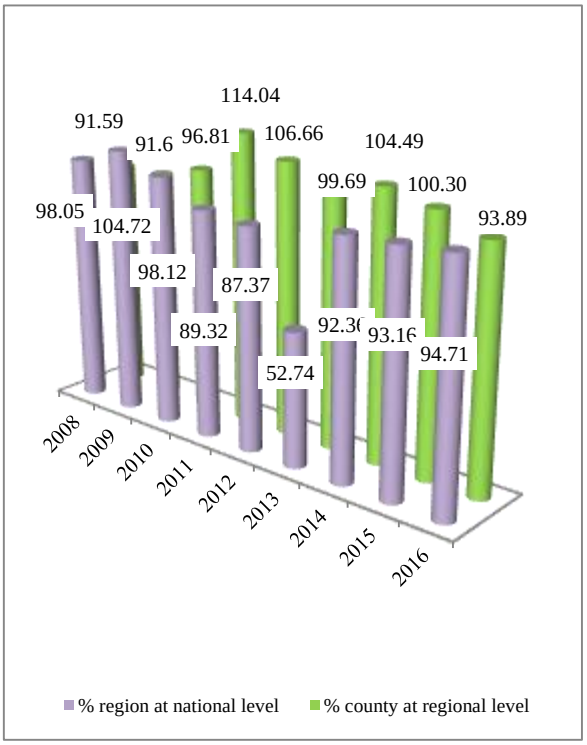

Fig. 3. South West Oltenia Region, Olt County - positions relative to national and regional average production (%)
Source: Own calculation and design.

CONCLUSIONS

Based on the data presented in the previous chapters, a series of conclusions can be drawn regarding the rapeseed offer at national, regional and county level.

Regarding the cultivated area, the following aspects are highlighted:

-at the national level: the indicator's amplitude variation was 432,035 ha (4.10 times the minimum, 19.60% decrease, compared to the maximum level of the indicator); the dynamics of the indicator was uneven;

-at regional level: a variation amplitude of 48,306 ha was observed, which represented 3.20 times increase of the minimum level (2013) and a decrease of 23.81% compared to the maximum level (2010); the dynamics of the indicator was fluctuating;

-at county level: the surface variation amplitude was of 23,904 ha, which exceeded the minimum indicator level (2012) by 3.56 times and was 21.92% lower than the maximum level (2010); the dynamics of the indicator was variable.

Regarding total rapeseed production, it is worth mentioning:

-at national level: a variation amplitude of 1,135,268 t, which exceeded 7.21 times the minimum term (2012) and was lower by 12.19% of the maximum term (2016); the dynamics of the indicator was uneven:

-at regional level: the variation amplitude was of 91,440 t, which exceeded 4.71 times the minimum term (2013) and was lower 17.33% with the maximum level (2016); the dynamics of the indicator was variable;
-at the county level: the registered amplitude reached 4,1675 t, which exceeded the 4.46 times the minimum term (2012) and was lower than the maximum term (2010) by 18.34%; the evolution of the indicator was fluctuating.

If we refer to the average production output per unit of production (kg / ha), the following conclusions can be drawn:
- at national level: the variance amplitude was 1.478 kg / ha, which exceeded 1.09 times the minimum (2009) and was lower than the maximum (2016) with 47.87%; the dynamics of the indicator was uneven, with growth trends for three of the last four years for the dynamic series;
-at regional level: the indicator has a variation amplitude of 1,415 kg / ha, which exceeded the minimum period (2013) of 1,11 times and was lower compared to the maximum term (2016) by 47,30%; the evolution of the indicator over time has been fluctuating;
-at the county level: the amplitude of the indicator variation was 1.255 kg / ha, which was lower than both the minimum (2013) and the maximum (2016) by 0.87 and 50.22% respectively; the dynamics of the indicator was variable.

Finally, Olt County is an important producer of rapeseed for South West Oltenia by the weights held at the cultivated area level (47.63%) and the total production (46.44%). The decrease of the share for total production, compared to the cultivated area, at regional level is explained by the lower average yield per hectare by 0.33% compared to the regional one. As well as at national and regional levels, there is an increase in performance for the last three years of the dynamic series.

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