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THE ANALYSIS OF THE TECHNICO-ECONOMIC INDICATORS FOR THE MAIN CROPS IN THE S-W REGION BETWEEN 2009-2017

TUREK-RAHOVEANU PETRUȚA¹

Abstract: *The agriculture has represented an important source of food for mankind since the ancient times. Romania is a country that has fertile soils and a climate that offers favorable conditions for agriculture. These conditions can also be found in the Oltenia S-W Region where the agriculture represents an important resource having over a million hectares that are used for grain crops and for the oleaginous plants. Within this study we are going to analyze the indicators regarding the evolution of the cultivated surfaces, the productions and the prices of the main crops (wheat, corn, sunflower): the average, the annual growth rate, the deviations in absolute scales.*

Key words: *productions, prices, annual rate, variation parameter*

JEL Classification: *Q10, Q11*

INTRODUCTION

The South-West Oltenia Development Region expands over 29212 km², representing 12,25% of Romania's surface. It has a population of 2330792 inhabitants and the main economical branch in the region is agriculture, which is favoured by the agrarian surface of the area, by the favourable climate conditions and the superior quality of the soil.

In the region, the grain crops fill large surfaces, so that in 2017 the wheat crop takes over 35% of total cultivated surface, corn takes 28,6%, the sunflower crop takes 13% and the last studied crop, rape, represents 5%.

The grain crops are cultivated mostly in the South of the region namely, in the Counties Olt, Dolj and in the South of Mehedinti.

MATERIAL AND METHOD

The analysis in this study is based on the statistic data from the publications given by The National Institute of Statistics regarding the surfaces, the productions and the prices of the main crops (wheat, corn, sunflower, rape), in the S-W Oltenia Development Region, between 2009-2017.

In the study there are used indicators that underline the evolution of the studied data through the analysis of the period's average as well as the increases from each year.

The calculation formulas used to calculate the indicators are the following²:

Dynamic analysis:

The fix base index: $I_{SC} = (SC_n/SC_0)*100$

The annual growth rate $r_{2009-2017} = \sqrt[n]{\pi \left(\frac{p_1}{p_0}\right)} - 1;$

where: $r_{2009-2017}$ = the average growth rate; $\prod p_1/p_0$ = chain base index

Standard deviation:

$$\hat{\sigma} = \sqrt{\frac{\sum(\bar{x}-x_i)^2}{n-1}}$$

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² Ceapoiu, N., 1968, Applied statistical methods in agricultural experiments and statistical Ed.Agro-Silva, Bucharest

where:

δ = standard deviation; \bar{x} = average per a number of years
 n = the number of analysed years

$$\text{Variation parameter} = C = \frac{\delta}{\bar{X}} \times 100,$$

where:

C-variation parameter – stated as a percent that can be small (0-10%), medium (10,1-20%) or high (higher than 20,1%).

The study has been conducted through the analysis of the statistic data available from the Eurostat and The National Institute of Statistics data base.

RESULTS AND DISCUSSIONS

In the South-West Oltenia Development Region, in 2017, there have been cultivated mainly grains for beads which represent over 72% of total cultivated surface with the main crops and the surface that has been cultivated with oleaginous plants represents over 18%, which comes to show that the region has soils and a climate favorable for larger crops.

Table nr.1

The evolution of the cultivated surfaces with the main crops in the S-W Oltenia Development Region 2009 - 2017

Crops	2009	2011	2013	2015	2017	Average	S dev	Variation parameter		Annual growth rate
	k ha	ki ha	k ha	k ha	k ha	k ha	k ha	%	Signif	%
Beads grain	824,76	791,65	819,15	807,71	816,33	807,54	29,50	3,65	small	-0,13
Wheat - total	381,77	350,05	387,17	363,82	404,78	376,04	30,32	8,06	small	0,73
Corn beads	382,34	386,46	346,64	360,47	323,98	355,78	39,64	11,14	medium	-2,05
Oleaginous plants	105,70	138,95	148,13	162,80	210,37	159,28	39,27	24,66	high	8,98
Sunflower	68,40	102,38	132,25	128,56	147,81	121,80	33,71	27,67	high	10,11
Rape	35,59	36,23	15,09	31,63	59,78	35,54	17,42	49,03	high	6,70

Source: NIS, 2018, TEMPO-AGRI108A

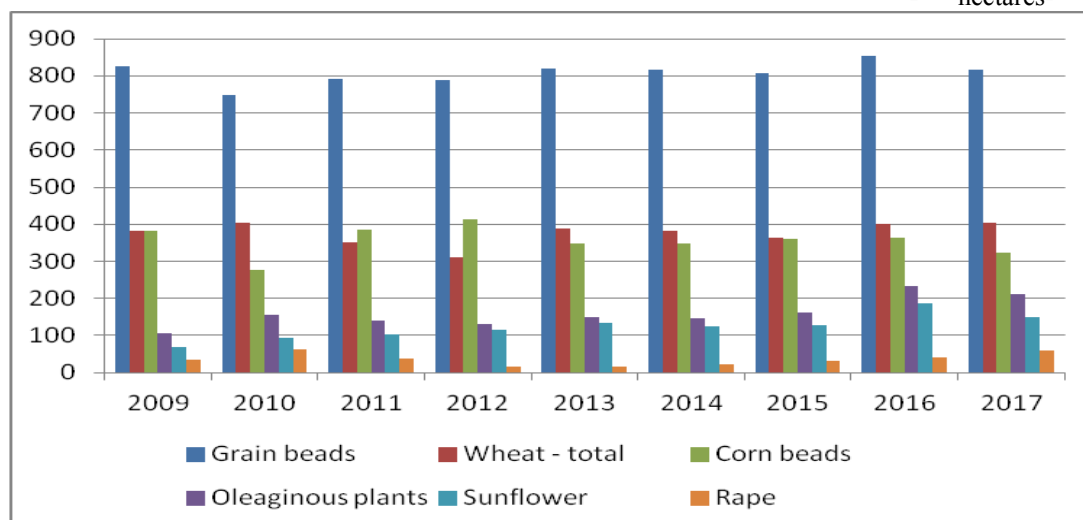
From analyzing the data from table 1 we can see that the surfaces cultivated with grains for beads had a small decrease in the analyzed period by 1% smaller in 2017 compared to the first year of the analyzed period and the oleaginous plants cultivated surfaces had an impressive increase doubling in 2017 compared to 2009.

Regarding the wheat cultivated surface, it represents almost half of the grain cultivated surface. In the analyzed period there has been registered a small increase of 6,03% in 2017 compared to 2009, with an annual growth rate of 0,7 % and a variation parameter of 8,1%.

Another significant ponderosity of the grain cultivated surfaces' total is represented by the surface cultivated with corn, respectively almost 40%. The corn crop from the analyzed period is the only one that registers a decrease of the surfaces so that in 2017 there have been 323.9 thousand ha compared to 2012 when there have been cultivated 414,3 thousand ha, which represents a decrease of 21,8% and compared to the reference year it registers a decrease of approx. 15%, with an annual rate of -2,05%.

Of the oleaginous plants cultivated surfaces, the surface that has been cultivated with sunflower holds over 70% and the one cultivated with rape 28,4%.

Diagram nr.1.
- hectares-



For the sunflower crop, the growth rate is of 10,11%, the surfaces cultivated in 2017 being twice larger than the reference year.

Comparing 2017 to 2009, one can see a significant increase of the rape crop with an annual rate of 6,7 %, a variation parameter of 49,03% representing a high variation of the analyzed data.

Table nr.2
The evolution of production of the main crops in the S-W Oltenia Development Region
2009 -2017

Crops	2009	2011	2013	2015	2017	Average	S dev	Variat. Param.	Signif.	Annual growth rate
	k tons	k tons	k tons	k tons	k tons	k tons	k tons	%		%
Grain beads	2593,18	2836,78	2777,51	2524,01	4330,57	2739,90	740,43	27,02	high	6,62
Wheat - total	995,11	1126,90	1096,19	1210,00	1916,77	1181,97	322,33	27,27	high	8,54
Corn beads	1453,24	1569,29	1475,75	1066,28	2076,78	1347,03	400,87	29,76	high	4,56
Oleaginous plants	162,54	239,47	257,35	286,98	634,42	305,93	146,61	47,92	high	18,56
Sunflower	110,64	178,24	237,43	209,67	466,27	230,00	107,80	46,87	high	19,70
Rape	50,57	60,91	19,16	73,62	162,43	73,14	46,78	63,96	high	15,70

Source: NIS, 2018, TEMPO-AGRII08A

By analyzing the evolution of the production of the studied crops it can be seen that they registered a growth in the analyzed period 2009-2017 (table nr.2) so that:

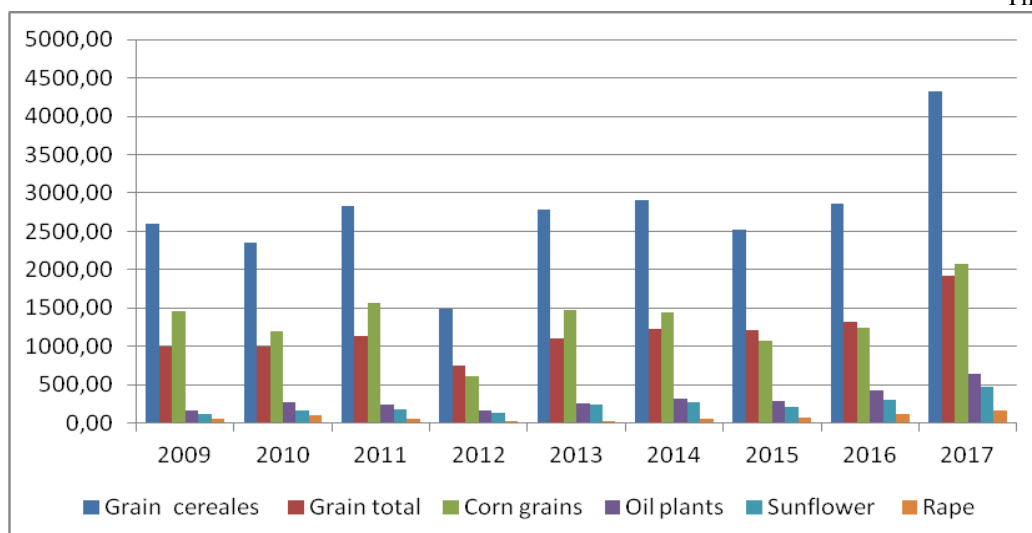
- in 2017, regarding the wheat crop the production is higher by 921,6 thousand tons compared to 2009 representing an increase of 92%, with an annual rate of 8,5%.

- the corn production in this period increases with an annual growth rate of 4,6%, registering a growth of 42,91% in 2017 compared to the reference year and of 67% compared to last year;

- regarding the sunflower crops the production increases at a fast pace of 19,7%, so that in 2017 it's four times higher than the reference year 2009.

- spectacular increases are also highlighted when it comes to the rape crop from 50,57 thousand tons in 2009 to 162,43 thousand tons in 2017, representing an increase of 220%, with an annual growth rate of 15,7%.

Diagram nr.2
-Thousand tons-



As it can be seen, the studied crop productions have increased during the analyzed period, bringing with them price increases for those crops.

Table nr.3

The evolution of the prices for the main crops in the S-W Oltenia Development Region between 2009-2017

Crop	2009	2011	2013	2015	2017	Average	S Dev	Var. Param.	Annual rate	
	lei/100kg	lei/100kg	lei/100kg	lei/100kg	lei/100kg	lei/100kg	lei/100kg	%	Signif	
Wheat	47	88	85	74	65	72,0	14,7	20,4	high	4,1
Corn	67	100	100	76	68	81,8	15,0	18,4	medium	0,2
Sunflower	86	158	159	150	137	141,1	28,3	20,0	high	6,0
Rape	97	162	157	164	158	148,6	25,6	17,3	medium	6,3

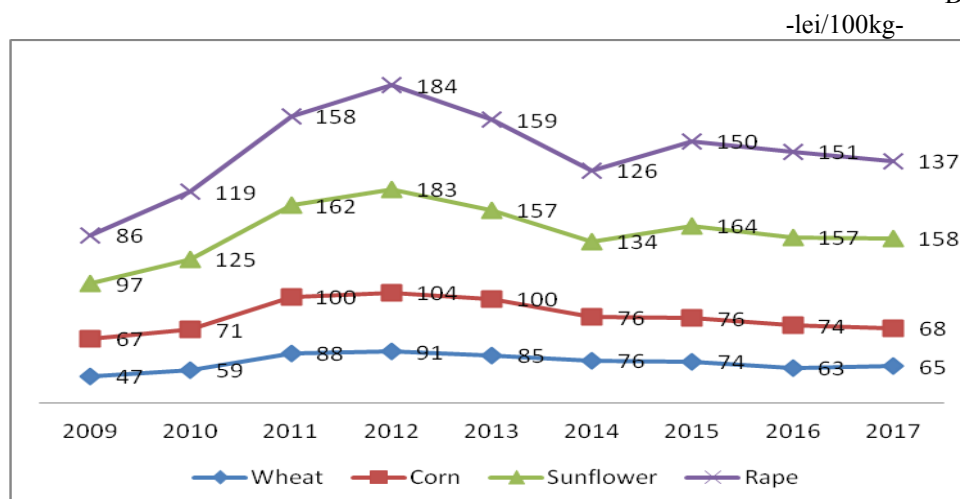
Source: Eurostat

From analyzing the data in table nr. 3, it can be seen that the selling prices have increased during the analyzed period 2009-2017, especially for the rape and sunflower crops by 62,8% , respectively 59,3% in 2017 compared to the first year of the analyzed period.

In the analyzed period the selling price of wheat has values between 0,47 lei/kg in 2009 and 0,91 lei/kg in 2012, representing an increase of 94%. Towards the end of the analyzed period it decreases, though surpassing 2009 by 38,3%.

Regarding the corn crop the price has a peak of 1,04 lei/kg in 2012 only to reach in 2017 the level from the reference year of 0,68 lei/kg.

Diagram nr.3



CONCLUSIONS

From the conducted study it can be seen the region's potential to cultivate the analyzed crops but it's not fully exploited.

The cultivated surfaces from the South-West Oltenia Region together with the main crops from 2009-2017 have increased at an annual rate of 1,2%, reaching from 2009 from 1,03 mil ha to 1,13 mil ha in 2017, representing a growth of 9,65%.

In the South-West Oltenia Region in 2017, given the favorable conditions for large crops there are cultivated especially grains for beads (72%) and oleaginous plants (18%). They hold a ponderosity of 15,7% out of our country's total grains for beads cultivated surfaces and the oleaginous plants hold a ponderosity of approx. 12%.

Regarding the ponderosity of the obtained productions of grains out of the country's total for this type of crops is 15,96% and for oleaginous plants is of 12,72%. It can be seen from analyzing the statistical data an important increase of the oleaginous plants surfaces and their production.

All the productions of the analyzed crops register increases, especially the sunflower crop which is in 2017 4 times higher compared to the first year of the analyzed period due to the increase of the cultivated surfaces but especially due to the increase of the average production from 1617 kg/ha in 2009 to 3154 kg /ha in 2017. All of that is due to the improvement of the technical-material basis and the top of the range cultivation technologies as a result of the support given through the measures from NRDP.

The selling prices have increased during the analyzed period for the majority of the studied crops, the exception being the selling price of corn that decreases in 2017 to the level from 2009, respectively to 0,68 lei/kg.

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