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KOMPARÁCIA VÝROBNO-EKONOMICKÝCH ZÁVISLOSTÍ PRI PESTOVANÍ SLNEČNICE ROČNEJ V SR

COMPARISON OF PRODUCTION AND ECONOMIC DEPENDENCE WITHIN THE GROWING OF SUNFLOWER IN THE SLOVAK REPUBLIC

Growing of oil crops has spread considerably in the last years. The most important oil crop grown in our conditions is oilseed rape. Sunflower is the second most important crop grown in the Slovak Republic. In this paper we evaluate the growing of sunflower from the production and economic point of view. Only the years 1996, 2004 – 2009 are dealt with in the paper. Obtained results show that economic advantage of growing of sunflower is affected mainly by the climatic conditions as well as by the intensification of production and support policy. The year 2007 was economically most advantageous of evaluated years. The highest loss within the growing of sunflower was recorded in 2009. Higher hectare yield of sunflower can be achieved by the intensification of production.

INTRODUCTION

Oil crops are important group of crops within the plant production in the world. They occupy second largest growing areas on arable land. The importance of growing of oil crops has increased recently due to different possibilities of their usage. One of the most significant oil crops is sunflower. Concerning its growing, it is the fourth most spread oil crop in the world and second most spread oil crop in Slovakia.

Sunflower – (Helianthus annuus) is native to Central America (Mexico). American Indians domesticated it 3000 BC. It belongs to the crops (potatoes, corn, and tobacco) that were introduced to other parts of the world in the beginning of the 16th century. It was first grown as a field crop in Germany and France. It started to be grown in former Czechoslovakia, mainly in warmer regions of the south of Slovakia, after the First World War.

The importance of sunflower consists in its growing and consequent obtaining of high quality oil. This oil is dietetically valuable and is used for technical but mainly for cooking purposes. Annual production in the world is 9 million tons of sunflower oil, which stands for 10% of plant oil production in the world. The main product of growing of sunflower is achenes. They present second most important source for the production of oil of excellent dietetical qualities. Sunflower can be used in many different ways.

Fibres from sunflower stems are used in China for paper production and in textile industry. Sunflower stems are source for heating. Extracted sunflower groats is a by-product that is formed within the oil production. It is used to produce fodder mixtures, which are important protein components. Sunflower is also grown as a fodder crop or as a crop for green manuring. It is thought to use the oil and its derivatives for the biofuel production. Different ways of using sunflower increase its advantage to be used as an alternative crop within the area ploughing in of frozen winter crops and winter rape.

Sunflower is an important crop, mainly in suitable natural conditions. It is grown for oil achenes that are used for cooking purposes (production of oil and fats – margarines) as well as for technical purposes (soft soaps and oil colours produced from less quality materials). The oil content varies according to sunflower varieties. The achenes contain 25 – 46% and seeds 40 – 65% of oil. The largest growing areas can be found in western part of Slovakia (69%). In central part of Slovakia they occupy 16% and in the eastern part 15% of agricultural land (Šimo, Rovný 2010).

MATERIAL AND METHODS

The main aim of the paper is to compare production and economic dependence within growing of sunflower in the Slovak Republic. The paper is based on the information gathered from the materials published by the Research Institute of Agricultural and Food Economics in Bratislava. Only the years 1996, 2004 – 2009 are dealt with in the paper. It also analyzes the production of sunflower from the following points of view: prime costs, yield, producer prices and subsidies. These are used to evaluate economic relations such as sales, cost efficiency, share of subsidies on settlement costs, share of subsidies on sales and break-event point of yield.

Also other materials published by the Ministry of Agriculture of the Slovak Republic and Statistical Office of the Slovak Republic are used to achieve the set objective. Yields presented in Table 1 as well as in other tables are gathered from different sources.

Efficiency of costs presents the index value which expresses the rate of profit (loss) from each Euro put into production.

The break-event point from 1 hectare (without subsidies) is expressed by the following formula:

$$\acute{U} = \frac{VN}{P}$$

The break-event point from 1 hectare (with subsidies) is expressed by the following formula:

$$\acute{U} = \frac{VN}{(P + D)}$$

The above mentioned point shows the minimum hectare yield of sunflower when the prime costs of sunflower production are equal to revenues.

VN – prime costs (€. ha^{-1})
P – exercise price (€. ha^{-1})
Ú – yield (t . ha^{-1})
D – subsidies per hectare

RESULTS AND DISCUSSION

Nowadays, within the production conditions of Slovakia, an attention is paid to solving production and economic relations of growing of sunflower. The aim is to determine development trends of growing in conditions of Slovakia within recent climate changes.

Table 1 shows selected marketing information on sunflower within given years. The observed indicators are rising. Harvested areas of sunflower rose by 58% (30,497 ha) from 1996 – 2009. The largest harvested areas were recorded in 2006 when they reached the area of 108,816 ha. The hectare yield increased as well. Concerning producers, the year 2008 was the best because the average hectare yield of sunflower reached 2.57 $t.ha^{-1}$. The production increased by 79%. The most significant increase (in %) was determined in relation to import due to the fact that in 1996, the import of sunflower into Slovakia was neglectable (408 ton) and within the domestic production it accounted for 0.4%. The domestic production rose by 19%. In our conditions, the domestic consumption of sunflower is used in food processing industry. The rest of the production is aimed at export which increased by 229% within given years. Sunflower belongs to Slovak pro-export commodities and it is very popular on the EU market.

Tab 1 Selected information on sunflower in Slovakia according to years (in ha, $t.ha^{-1}$, t)

Indicator	Years							
	1996	2004	2005	2006	2007	2008	2009	Index 09/96
Harvested area	52,447	90,031	91,000	108,816	64,746	74,934	82,944	1.58
Yield	1.98	2.18	2.14	2.10	2.05	2.57	2.26	1.14
Production	104,753	196,351	195,000	228,606	132,656	192,346	187,238	1.79
Import	408	500	450	2,879	2,728	5,734	9,018	22.10
Export	59,600	134,000	96,668	108,490	97,678	118,080	136,256	2.29
Domestic consumption	50,332	63,000	68,000	102,701	65,000	80,000	60,000	1.19

Source: VÚEPP Bratislava : Olejniny. Situačná a výhľadová správa , own calcutations.

Table 2 presents hectare yields, producer prices, prime costs and cost efficiency within the growing of sunflower. The highest producer price was recorded in 2007 (374.63 €.t^{-1}) and the lowest producer price was observed in 2009 (198.27 €.t^{-1}). A significant decrease in producer prices of sunflower after the year 2007 was caused by

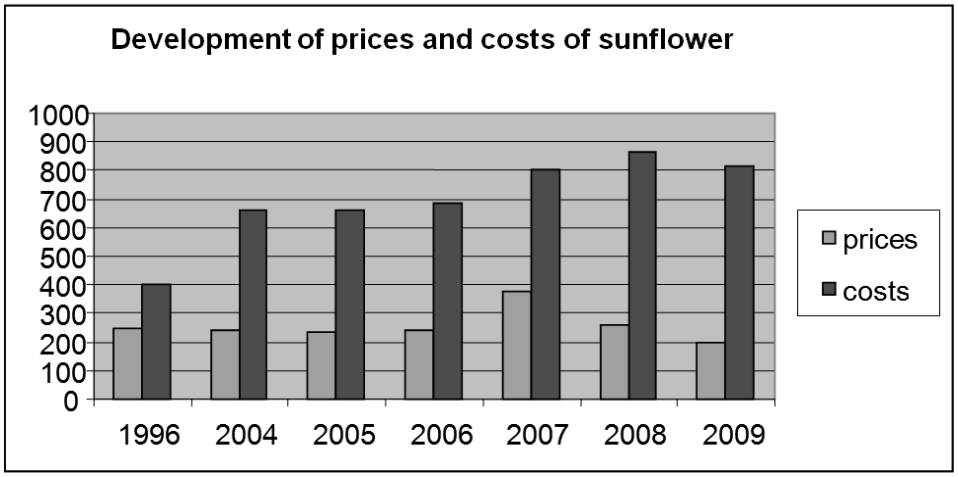
the incoming world economic crisis, above average yield and consequent oversupply of sunflower in conditions of the Slovak Republic. In 2007 – 2009 the price of sunflower decreased enormously by 176.36 €.t^{-1} which was 53%. Prime costs increased by 103% from 1996 – 2009. The increase of prices of fertilizers and means of chemical crop protection affected considerably the increase of costs. There was a significant decrease of production efficiency in 2008 and 2009. The producers of sunflower reached the sales of 0.85 or 0.65 € (without subsidies) for 1 € invested into the production. Graph 1 presents the development of producer prices and prime costs of sunflower within given years. Graph 1 shows the increase of prime costs and fluctuation of producer prices of sunflower.

Tab 2 Production and economic analysis of growing of sunflower in Slovakia according to years (without subsidies)

Years	Yield in t.ha^{-1}	Producer price in €.t^{-1}	Prime costs in €.ha^{-1}	Sales in €.ha^{-1}	Cost efficiency in €
1996	2.03	247.86	401.78	503.16	1.25
2004	2.39	238.83	659.23	570.80	0.87
2005	2.32	236.17	659.60	547.91	0.83
2006	2.22	238.70	685.92	529.91	0.77
2007	2.27	374.63	804.22	850.41	1.06
2008	2.85	257.39	866.69	733.56	0.85
2009	2.51	198.27	816.60	497.66	0.61
Index 09/96	1.24	0.80	2.03	0.99	-

Source: Prime costs and economic results of agricultural companies in Slovakia in 1996, 2004 – 2009 VÚEPP Bratislava, own calculations.

Graph 1 Development of producer prices and prime costs of sunflower (€.t^{-1}, €.ha^{-1})



Source: Prime costs and economy results of agricultural companies in Slovakia in 1996, 2004 – 2009 VÚEPP Bratislava

Concerning the cost efficiency it can be stated that the highest cost efficiency (without subsidies) for 1 € invested into the production was recorded in 1996 (1.25 €). The lowest cost efficiency for 1 € invested into the production was reached in 2009 (0.61 €).

Table 3 indicates the efficiency of sunflower subsidies within given years. The results show that the highest share of subsidies on settlement costs was recorded in 2004 (23.74%) and the lowest one in 1996 (9.5%). The subsidies per hectare of growing sunflower reached the lowest value in 1996 (38.17 €.ha^{-1}) and the highest one in 2007 (172.77 €.ha^{-1}). Obtained results clearly indicate that the entrance of Slovakia into the EU (2004) increased considerably sunflower subsidies.

Tab 3 Efficiency analysis of sunflower subsidies in Slovakia according to years

Year	Subsidies v €.t^{-1}	Subsidies v €.ha^{-1}	Share of subsidies on settlement costs in %	Share of subsidies on sales in %
1996	18.82	38.17	9.50	7.59
2004	65.46	156.48	23.74	27.41
2005	63.87	148.14	22.46	27.04
2006	55.20	122.52	17.86	23.12
2007	76.11	172.77	21.48	20.32
2008	48.36	137.82	15.90	18.79
2009	61.57	154.58	18.93	31.06
Index 09/96	-	4.05	1.99	-

Source: Prime costs and economy results of agricultural companies in the Slovak Republic in 1996, 2004 – 2009 VÚEPP Bratislava, own calculations.

Break-event points of sunflower yield are evaluated in Table 4. The break-event point expresses economic situation when all costs are covered and there is neither profit nor loss. The bigger amount of production is achieved above the break-event point, the bigger profit is gained in the evaluated year. Moreover, this year is less influenced by risk factors such as the change of exercise price within the sale. The bigger amount of production is achieved below the break-event point, the bigger loss is recorded in relation to the sunflower production within the evaluated year.

The biggest difference in calculated break-event point of sunflower yield (without subsidies) was reached in 2009 (-1.61 t.ha^{-1}). This means that if the sunflower yield increased by 1.61 t.ha^{-1}, the costs of growing of sunflower would be equal to sales. Economically most advantageous years of growing of sunflower were years 1996 and 2007 when the growing of sunflower was profitable also without the implementation of any subsidies. The growing of sunflower was loss-making even with the implementation of subsidies in 2006 and 2009. The production of sunflower was profitable with the implementation of subsidies in 2004, 2005 and 2008.

The data in Table 4 indicate the need for the intensification of production. This can be done mainly by implementing positive experience and results of successful producers who reach the yield 2.6 - 3 t.ha^{-1} and more. The profitability of growing of sunflower was influenced by the following important factors: hectare yields, prime costs, subsidies and exercise prices.

Tab 4 Break-event points of sunflower yield in Slovakia according to years

Indicator		Years						
		1996	2004	2005	2006	2007	2008	2009
Yield in t.ha^{-1}		2.03	2.39	2.32	2.22	2.27	2.85	2.51
Break-event point in t.ha^{-1}	1	1.62	2.76	2.79	2.87	2.15	3.37	4.12
	2	1.47	2.11	2.17	2.36	1.69	2.83	3.34
Difference in t.ha^{-1}	1	0.41	- 0.37	- 0.47	- 0.51	0.12	- 0.52	- 1.61
	2	0.56	0.28	0.15	- 0.14	0.58	0.02	- 0.83
Profit (loss) in €.ha^{-1}	1	101.37	- 88.73	- 111.66	- 156.01	46.17	- 133.14	- 318.96
	2	139.55	68.05	36.47	- 33.49	218.95	4.68	- 164.37

Source: Prime costs and economy results of agricultural companies in the Slovak Republic in 1996, 2004 – 2009 VÚEPP Bratislava, own calculations.
Note: 1 – without subsidies, 2 – with subsidies

Upcoming yields will be significantly influenced by climate changes (increase of average temperatures together with the reduction of rainfall). This fact has already been recorded in the last years. Therefore, the agricultural companies will have to focus on the selection of appropriate forecrop and to respect the growing procedure within the production. They will also have to pay attention to the consequent soil preparation, date and density of sowing and to the provision of optimal protection and nutrition which is the task of the management of agricultural company.

REFERENCES

Burianová, V. 2010. *Náklady a výnosy poľnohospodárskych výrobkov v SR za rok 2009*. Bratislava: VÚEPP, 2010. ISBN 978-80-8058-551-8.
Kubanková, M. - Burianová, V. 2009. *Náklady a výnosy poľnohospodárskych výrobkov v SR za rok 2008*. Bratislava: VÚEPP, 2009. ISBN 978-80-8058-525-9.
Kubanková, M. - Burianová, V. 2008. *Náklady a výnosy poľnohospodárskych výrobkov v SR za rok 2007*. Bratislava: VÚEPP, 2008. ISBN 978-80-8058-492-4.
Kubanková, M. - Burianová, V. 2007. *Náklady a výnosy poľnohospodárskych výrobkov v SR za rok 2006*. Bratislava: VÚEPP, 2007. ISBN 978-80-8058-525-9.
Kubanková, M. - Burianová, V. 2006. *Náklady a výnosy poľnohospodárskych výrobkov v SR za rok 2005*. Bratislava: VÚEPP, 2006. ISBN 80-8058-444-3.
Kubanková, M. - Burianová, V. 2005. *Náklady a výnosy poľnohospodárskych výrobkov v SR za rok 2004*. Bratislava: VÚEPP, 2005. ISBN 80-8058-381-1.
Kubanková, M. - Burianová, V. 1997. *Náklady a výnosy poľnohospodárskych výrobkov v SR za rok 1996*. Bratislava: VÚEPP, 1997. ISBN 80-88731-83-6.
Šimo, D. - Rovný, P. 2010. *Agrárny marketing*. Nitra: SPU, 2010. 279 s. ISBN 978-80-552-0472-7.
Tibenská, H. 2010. *Olejniny. Situačná a výhľadová správa*. Bratislava: VÚEPP, 2010. 59 s. ISSN 1337-4540.
Syngenta, n.d. Slnečnica. [cited 21.03.2011]. Dostupné na: http://www.syngenta.sk/index.php?produkty&plodina=Slnecnica.

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