

FACTORS UNDERLYING THE PROFITABILITY IN THE RAPESEED PRODUCTION

FAKTORY ZISKOVOSTI PŘI VÝROBĚ ŘEPKY

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Abstract:

This paper deals with the analysis of profit reached in the rapeseed production. Rapeseed importance to profitability of national agricultural producers is indispensable with regard to possible multifunctioned use of this farm crop. The rapeseed profit is influenced by many factors. The aim of this paper is determination of those factors, which exercise the highest influence on the level of profit, by means of profitability factors analysis of this branch.

Keywords:

Rapeseed, profit, cost rate of production, factorial analysis.

Anotace:

Tento příspěvek se zabývá analýzou zisku dosahovaného při výrobě řepky. Význam řepky pro rentabilitu domácích zemědělských podniků je vzhledem k možnému mnohostrannému uplatnění této plodiny nezanedbatelný. Zisk dosahovaný při výrobě řepky je ovlivňován mnoha činiteli. Cílem tohoto příspěvku je prostřednictvím analýzy faktorů ziskovosti tohoto odvětví určit podíl těch činitelů, které výši dosahovaného zisku nejvíce ovlivňují.

Klíčová slova:

Řepka, zisk, nákladovost výroby, faktorová analýza.

INTRODUCTION

The Czech market enters into a development period, which is of fundamental and in many cases existential importance for most of farming businesses. It is efficient to give attention to those agricultural commodities, which enable farmers to hold a place on expanded common market. One of perspective domestic commodity is winter rape, which is for economics of Czech farming businesses surely a stabilizing factor. Also rapeseed for non-food use is of great importance.

Winter rape occupies a good position on the EU market. The Czech rapeseed production is competitive to world market and the Czech Republic has real chances of become an important exporter of oilseeds also to the internal EU market. Of course it will depend on rapeseed production effectiveness. This effectiveness takes effect in figure of reached profit and influences stability and competitiveness of farming business.

OBJECTIVES AND METHODS

The aim of this paper is factor analysis of rapeseed production profitability and to determine share of those factors, which exercise the highest influence on the level of profit. The index analysis was used according to the methodical conception, which is mentioned in cited literature^[1].

The profit was defined according to the relation $\Pi = Q(p - c)$, where Q presents production of the main product in tons, p presents average market price of one ton of rapeseed

in CZK and c presents costs of one ton of rapeseed in CZK.

Further there were calculated indexes of profitability (I_{Π}) as a quotient of the profit of the compared year (index 1) to the profit of the basic year (index 0) according to the

relation $I_{\Pi} = \frac{\Pi_1}{\Pi_0} = \frac{Q_1 (p_1 - c_1)}{Q_0 (p_0 - c_0)}$. The total index was distributed into three partial indexes,

which describe the influence of changes of the single factors on the level of reached profit:

$I_{\Pi} = I_{\Pi(Q)} + I_{\Pi(p)} + I_{\Pi(c)}$. The single indexes describe the influence of profit change in

consequence of the change: a) of production of the main product $I_{\Pi(Q)} = \frac{Q_1 (p_0 - c_0)}{Q_0 (p_0 - c_0)}$; b) of

the average market price of one ton of rapeseed $I_{\Pi(p)} = \frac{Q_1 (p_1 - c_0)}{Q_1 (p_0 - c_0)}$; c) of the cost of one ton

of rapeseed $I_{\Pi(c)} = \frac{Q_1 (p_1 - c_1)}{Q_1 (p_1 - c_0)}$.

Not least there were defined absolute profit changes as well in dependence on participation of influence of the single parameters. The total profit change between comparative periods was defined according to the relation $\Delta\Pi = \Delta\Pi_Q + \Delta\Pi_p + \Delta\Pi_c$. The

single partial changes were calculated according to the relations: a) the partial change affected by differential rapeseed production $\Delta\Pi_Q = Q_1 (p_0 - c_0) - Q_0 (p_0 - c_0)$; b) the partial change affected by differential average market price of one ton of rapeseed

$\Delta\Pi_p = Q_1 (p_1 - c_0) - Q_1 (p_0 - c_0)$; c) the partial change affected by differential costs of one ton of rapeseed $\Delta\Pi_c = Q_1 (p_1 - c_1) - Q_1 (p_1 - c_0)$.

The data were assumed from the survey on the costs of agricultural product in the Farm Accountancy Data Network (FADN) by individual farms, provided by the Research Institute of Agricultural Economics Prague^[2] and from the situation and perspective report "Oilseeds", provided by the Ministry of Agriculture of the Czech Republic^[3].

RESULTS

Analysis of rapeseed production profitability

Winter rape growing in the agriculture businesses presents branch, which can participate in stability of farm economy largely. The level of rapeseed production shows upward trend by the year 2002^[4]. The production grew thanks to increases in winter rape acreage. The bumper crop in 2001 was the highest in the past 13 year and takes effect on level of reached profit (simulated estimation for the Czech Republic), as shows Chart 1.

Special situation was in 2002 and 2003. These years were for farmers very unfavourable – in 2002 because of 200-year recurrence flood, in 2003 because of extremely drought. The rapeseed production in 2002 achieved 709 533 ton, which means reduction by 27 % compared to crop of the previous year. The rapeseed production in 2003 sunk to 387 805 ton, which means reduction by 45 % compared to crop of the previous year. Although the enormous fall of rapeseed production in 2002 and 2003 cause extreme climatic conditions, there is also participation of other influences.

The average yield per hectare in 2002 sunk by 19 % compared to the previous year. In 2003 the average yield per hectare 1,55 ton was the lowest in the last 24 year. Economical conditions for production taking didn't reflect low production in Europe, so the prices didn't compensate for the yield fall. The price of rapeseed after crop corresponded to world price.

Chart 1: Selected parameters of rapeseed production of farms FADN CZ in the Czech Republic in years 2001 - 2003

<i>Parameter</i>	<i>Unit</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>
Reap area	tsd. ha	343	312	251
Yield per hectare	t.ha ⁻¹	2,84	2,27	1,55
Rapeseed production	tsd. t	974	708	389
Average market price of 1 t rapeseed	CZK.t ⁻¹	6 904	6 467	7 348
Costs of 1 t rapeseed	CZK.t ⁻¹	5 854	7 990	12 081
Total profit	tsd. CZK	1 022 826	-1 078 650	-1 841 137

Source: VÚZE, MZe, self calculations

Costs of one ton of rapeseed attained about 12 tsd. CZK in 2003, which means increasing by 51 % compared to the previous year. With regard to low market prices didn't reach profit in the rapeseed production in 2002 and 2003. Indeed the unfavourable conditions by rapeseed production the determination of profitability can't be objective defined.

Index of profitability of the year 2002 compared to the year 2001 was -1,05. In this change take evaluated parameters different share (see Chart 2). The biggest share takes increasing of costs of one ton of rapeseed (index of the profit change in consequence of the change of costs of one ton of rapeseed was -2,49).

The heavy loss was achieved also in 2003 (- 1841 137 CZK). Index of profitability of the year 2003 compared to the year 2002 was 1,71. In this change takes the biggest share increasing of costs of one ton of rapeseed, too (index of the profit change in consequence of the change of costs of one ton of rapeseed was 7,37).

The total index of profitability and the single indexes underlying the profitability in the rapeseed production are evident from the next view (Chart 2).

Chart 2: Profit indexes in the rapeseed production in the Czech Republic in years 2001 - 2003

<i>Period</i>	<i>I_Π</i>	<i>I_{Π (p)}</i>	<i>I_{Π (c)}</i>	<i>I_{Π (n)}</i>
2002/2001	-1,05	0,73	0,58	-2,49
2003/2002	1,71	0,55	0,42	7,37

Source: self calculations

The changes of profitability owing to selected parameters illustrate also the results of decomposition of the total change on partial influences of the single parameters (Chart 3). The change of profitability in 2002 compared to 2001 was caused by increasing of cost of one ton of rapeseed (by -1 512 654 CZK). The total profit change caused at least change of production volume (13,3 %), but also change of average market price of one ton of rapeseed took share of 14,7 %.

Situation of the year 2003 was also at least caused by decreasing of production volume (-64 % impact on the profit changes) and increasing of average market price of one ton of rapeseed (-50 % impact on the profit changes). The biggest impact on the profit changes had increase of cost of one ton of rapeseed (+209 % impact on the profit changes). The costs of rapeseed production are affected by different natural conditions, different production intensity and different work attitude in agriculture businesses.

Following view (Chart 3) shows the estimation of the impact of changes of those factors, which have the most important influence on total change of profitability.

Chart 3: The estimation of the impact of changes of selected parameters on the profit changes in rapeseed production in the Czech Republic in years 2001 - 2003

<i>Parameter</i>	<i>Changes in period</i>			
	<i>2002 a 2001</i>		<i>2003 a 2002</i>	
	CZK	%	CZK	%
Total profit change	-2 101 476	100	-762 487	100
Of this owing to:				
Production volume	-279 426	13,3	486 203	-63,8
Average market price of 1 t rapeseed	-309 396	14,7	342 709	-44,9
Cost of 1 t rapeseed	-1 512 654	72,0	-1 591 399	208,7

Source: self calculations

Weather is very important factor influencing rapeseed production to a great degree and in the years 1998 – 2001 was favourable. Reached yields were also stabile and high. The farmers increased inputs, which took affect to the high effectiveness of rapeseed production. This positive trend was however changed in the last few years by many adverse impacts, especially by increasing of injurious agents, decreasing of soil fertility, decreasing of level of complex attitude to agricultural engineering, increasing of costs and decreasing of profitability.

DISCUSSION

The level achieved profit by rapeseed production is influenced by many factors. Results of the analysis proved that the level of profit is to the highest extent influenced by the costs of production. Lower costs can be reached by lower costs of inputs, lower costs of service, lower indirect costs. Another important decision deals with intensity of growing. Too high inputs in intensive technology of rapeseed production can be a big risk with negative impact on economic result of agriculture business. However extensive rapeseed growing has also from long-term point of view certain risks, because vermin and diseases danger is in the last years very high.

All meaningful production, not only agricultural, must appear from economy and the result of production must be profit creation, eventually minimalisation of loss. Therefore shout deny to attention above all on observance of the agro technical rules and on removing of the fundamental cause of yield decrease. These causes are different in different production localities. The attitude to economy of single farms projects in results of production economy. Primarily it depends on financial and economical strategy of agriculture business, on level of control and organizational work, on market situation or on human resources.

CONCLUSIONS

From actual development of agricultural production is visible that current period is - among others - noted for economic instability. The input prices reflect on costs in production, whether producer can influence these costs or not. The input and output costs, which form the market production, are under the thumb of market environment on the one hand and under the thumb of weather and level of strict observance of technological discipline on the farm on the other hand.

From interrelation of costs, prices and yields in the market environment appear the prosperity and competitiveness of production. For manager decisions making is necessary to analyze available data. If the good yield of rapeseed is reached, this crop has also favourable economics of production. The prices on Czech market reach practically the world level and

this dependence will determine the profitability of rapeseed production in the Czech Republic also in the future.

The conditions of implementing of the vegetable production in the Czech Republic are very variable. The fundamental step is observance of right production technology and choice of resistant rapeseed variety. The positive profitability was changes owing to extreme weather progression in 2002. There was impact to restriction of rapeseed reap areas, yields per hectare and total production. Also the market prices of rapeseed decreased. The uneconomical rapeseed production continued in 2003. The main reason is costs increasing, which was induced by complex of unfavourable factors. However the objective determination of profitability is not possible because of unfavourable conditions in rapeseed production of recent years.

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