Economic efficiency of agricultural enterprises in the system of organic farming

Ekonomická efektivnost hospodaření zemědělských podniků v ekologických systémech

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Abstract: The aim of this presentation is to introduce partial results of this research project aimed to the efficiency of businesses working with the organic systems. The proposal of mesures will be formed with the respect of results of analysis to support organic businesses, to increase organic land area corresponding with the progress in the EU and therefore to help to satisfy increasing demand for organic food, last but not least also to prove, that organic agriculture is truly functioning part of multifunctional agriculture.

Key words: organic agriculture, development of organic agriculture, support of organic agriculture

Abstrakt: Cílem příspěvku je uvést dílčí výsledky výzkumného projektu, zaměřeného na efektivnost hospodaření podniků v ekologických systémech. V návaznosti na výsledky analýz budou formulovány návrhy opatření, které by měly přispět k podpoře ekologicky hospodařících podniků, ke zvýšení výměry ekologicky obhospodařované půdy v souladu s vývojem v zemích EU a tím k lepšímu uspokojení zvyšující se poptávky po biopotravinách a v neposlední řadě tak dokázat, že ekologické zemědělství je skutečně fungující součástí multifunkčního zemědělství.

Klíčová slova: ekologické zemědělství, vývoj ekologického zemědělství, podpora ekologického zemědělství

Organic agriculture is one of the possibilities, how to sustain the complex of production and non-production functions of agriculture in rural areas, especially in the LFA. In the long run, there is a big chance for organic agriculture, since the EU has a great interest to diversify the development of rural areas. The Common Agriculture Policy considers organic agriculture as one of the possible ways of diversification. The main reason to support organic agriculture can be seen in the increasing consumer demand for organic food products, which remains, not only in the Czech Republic, dissatisfied.

Organic agriculture is a very progressive way of farming based on the natural laws with no use of artificial fertilisers, protective chemicals, sprays, hormones and synthetic substances. Its goal is to avoid all forms of pollution coming from agriculture, to produce food and fertilisers in sufficient amount, but with high nutritional value, also to create welfare for animals corresponding with their ethological and physiological needs. On the other hand, organic agriculture has to allow for economic and social development of the farmers and to contribute to employment in rural areas.

Development of organic agriculture is supported in various ways in different countries. State support should be always derived from the consistent analysis of recent situation and also reflect experiences from countries dealing with organic agriculture for a long time.

GOALS AND METHODOLOGY

The aim of this paper is to present partial outcomes of the research project QC 1140 "The effectiveness of enterprises under organic management and possibilities of increasing their competitiveness" solved under the National Grant Agency of Agricultural Research.

Solution of this research project includes five problem areas focused on:

– Setting a sample file of entrepreneurial subjects under organic management and determining their commodity orientation.
– Measuring different technologies of selected vegetable and animal commodities production with the goal of tracing varieties in the volume and structure of their costs.
– Measuring effectiveness of selected commodities through their costs, revenues, profitability and comparison with the conventional products.

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– Comparison of profitability or loss-making of organic and conventional products.
– Definition of the proposals leading to increase of the land area under organic management and to increase of the of organic products supply.

RESULTS

Setting the sample file of organic enterprises

The main criterion influencing the enterprise selection was the need to minimise the number of interviewed enterprises due to the limited amount of research money. It could be mainly done by interviewing larger enterprises which have a higher share in the organic production in the Czech Republic and also have a broad range of organic products. Another reason for choosing larger enterprises was the expectation of getting a relatively authentic information and the possibility of their consequential verification. The lack of evidence and almost no possibility of information verification disables small enterprises. Chosen methodology of selection and addressed enterprises is a compromise of the above-mentioned factors.

Result of the enterprise selection is the sample file of 42 enterprises under organic management, their basic characteristics are listed in Table 1.

The total land area of enterprises included in this sample file corresponds with 20.1% of the total land area under organic management in the Czech Republic.

Enterprises included in this sample file are focused on several commodities in plant production as well as in animal husbandry. The main crops are oats, wheat, potatoes, spelt, triticale and buckwheat, main animal products are milking cows, beef cows, sheep, cattle fattening.

ANALYSIS OF ORGANIC ENTERPRISES' COST AND PRODUCTIVITY

Methodology of finding out the cost and productivity of organic as well as conventional enterprises derives the cost of individual commodities from the used technological processes with the goal of respecting found out differences in cost structure, cost height of these commodities. Technological processes include individual steps cohering with soil cultivation, seeding, planting, fertilising, plant protection and harvesting including fodder plants harvesting.

Organic products are measured with respect to direct and indirect costs in the same structure as costs are measured in enterprises included in sample file of the VÚZE (the Research Institute of Agricultural Economics) due

Table 1. Basic characteristics of organic farms' sample file

Legal title	No. of subjects	Land area in hectares		
		agricultural land	arable land	
			in sum	organic land
Individual farmers	24	7 170.07	1 620.17	1 024.19
LLCs	10	14 357.08	2 673.03	1 839.58
Corporations	1	1 408.52	1 345.86	212.96
Cooperatives	4	6 458.40	2 955.79	933.20
Associations of individuals	1	69.03	1.50	1.50
Training farms	1	947.66	711.42	89.79
State farms	1	2 967.96	658.33	658.33
Sample file in sum	42	33 378.72	9 966.10	4 759.55

Legal title	Land area in hectares							
	grasslands		pastures		vineyards		fruit orchards	
	in sum	organic	in sum	organic	in sum	organic	in sum	organic
Individual farmers	2 962.03	2 913.72	2 581.17	2 581.17	1.66	1.66	5.65	5.65
LLCs	8 564.78	8 564.78	3 119.27	3 119.27	0.00	0.00	0.00	0.00
Corporations	23.65	0.00	0.00	0.00	38.49	0.00	0.00	0.00
Cooperatives	2 614.66	1 431.88	887.45	872.57	0.00	0.00	0.00	0.00
Associations of individuals	32.70	32.70	34.83	34.83	0.00	0.00	0.00	0.00
Training farms	236.24	35.96	0.00	0.00	0.00	0.00	0.00	0.00
State farms	0.00	0.00	2 309.63	1 500.74	0.00	0.00	0.00	0.00
Sample file in sum	14 434.06	12 979.04	8 932.35	8 108.58	40.15	1.66	5.65	5.65

to the possibility of comparing organic enterprises' sample file with this sample file.

Division to fixed and variable cost is also used while measuring the organic products' costs with the aim to evaluate efficiency of the selected organic products through deficiency payment. Deficiency payment is one of the modern methods considering decision-making system aspects. It provides information to the producer about the convenience of the product and also information about the minimum level of sale price. This concept of evaluation is used for both plant production and also animal husbandry.

It is also very important to follow besides costs also the productivity of organic products while considering their efficiency and profitability. Varieties in per hectare yields will be considered in plant production and livestock efficiency in animal husbandry in connection to input level, total revenues, price differences between organic and conventional products.

The mentioned methodological process was verified for its validity through cost/revenue analysis of a selected enterprise specialised in organic plant production as well as organic animal husbandry. The results of cost and revenue comparison of this enterprise and the conventional enterprises sample file are introduced in Table 2.

From the above listed results, there are apparent generally expected differences in the main cost items for both compared methods of farming. Enterprises under organic management show a markedly lower consumption of material inputs compared to conventional agricultural enterprises. This is mainly caused by the impossibility to use chemicals and artificial fertilisers. Total per hectare cost stand at the same level, which is caused by a higher level of services and other direct cost.

Lower per hectare yields cause non-profitability of organic products in the analysed enterprise. In one year horizon, lower yields could be influenced by the unfavourable climate and other factors, but in the long run, we can talk about a general trend. Organic products have to be sold for higher market prices than conventional products to secure their profitability. The initiated enterprise is presently at the final stage of conversion, so later on, when the enterprise is fully converted to organic farming, we can expect the stability of per hectare yields and the higher quality of organic products will be reflected in higher farmers' prices.

Next to the cost of plant production, there were also compared costs of animal products. The main cost items in animal husbandry of the analysed enterprise and the compared sample file of enterprises are listed in Tables 3 and 4.

There can be found parallel trends in animal husbandry as we can find in plant production concerning total costs of individual products. The level of total costs is similar for both – organic enterprises and also conventional enterprises. Only one exception can be seen in the category "calves under 6 months of age", where organic enterprises show much lower total costs per head per year. This fact is mainly caused by the markedly lower feed costs. This difference is specific for organic calves,

Table 2. Comparison of plant products' cost and revenues in organic and conventional farming systems in year 2000

Cost item	Unit	Organic spelt	Conventional spring wheat	Organic triticale	Conventional triticale
Seeds	CZK/ha	1 842	1 239	801	917
– bought	CZK/ha	1 842	816	0	605
– own production	CZK/ha	0	423	801	312
Fertilizers	CZK/ha	626	1 417	626	1 302
– bought	CZK/ha	0	1 368	0	1 239
– own production	CZK/ha	626	49	626	63
Plant protection	CZK/ha	0	889	0	663
Other direct material	CZK/ha	0	202	0	241
Direct material cost in sum	CZK/ha	2 468	3 747	1 427	3 123
Other direct cost and services	CZK/ha	3 379	954	3 045	743
Direct labour expenses including social and health insurance	CZK/ha	1 656	1 801	1 652	1 457
Cost of subsidiary activities	CZK/ha	1 470	1 681	1 466	1 172
Depreciations of long-term tangible assets	CZK/ha	243	0	242	5
Indirect cost	CZK/ha	1 109	1 896	1 107	1 584
Total cost	CZK/ha	10 325	10 079	8 939	8 084
Yield per one hectare	t/ha	1.29	3.35	2.36	3.90
Product Revenues	CZK/ha	4 131	6 249	7 322	4 238
Average farmers' price	CZK/t	3 202	3 335	3 100	3 048

Table 3. Cost of selected beef categories in farm under organic management in year 2000

Cost item	Unit	Calves under 6 months of age	Heifers under 5 months of pregnancy	High-pregnant heifers	Fattening of cattle	Beef cattle
Feed (bedding)	CZK/pc/year	2 481	3 991	6 601	5 116	5 935
– bought	CZK/pc/year	171	253	640	261	430
– own production	CZK/pc/year	2 310	3 737	5 960	4 856	5 504
Pharmaceuticals and disinfectants	CZK/pc/year	0	1	0	347	280
Other direct materials	CZK/pc/year	0	0	0	0	0
Direct material cost in sum	CZK/pc/year	2 310	3 992	6 601	5 463	6 215
Other direct cost and services	CZK/pc/year	0	55	0	0	49
Direct labour expenses including social and health insurance	CZK/pc/year	639	2 080	2 941	2 039	2 906
Cost of subsidiary activities	CZK/pc/year	1 058	3 445	4 869	3 376	4 813
Depreciations of long-term tangible assets	CZK/pc/year	129	0	0	1 753	132
Depreciation of herd	CZK/pc/year	0	0	0	0	7 203
Indirect cost	CZK/pc/year	339	1 013	1 402	959	1 368
Total cost	CZK/pc/year	4 475	10 585	15 813	13 590	22 686

Table 4. Cost of selected beef categories in conventional farms' sample file in year 2000

Cost item	Unit	Calves under 6 months of age	Heifers under 5 months of pregnancy	High-pregnant heifers	Fattening of cattle	Beef cattle
Feed (bedding)	CZK/pc/year	7 122	4 946	8 381	6 713	4 544
– bought	CZK/pc/year	2 486	591	1 380	1 278	507
– own production	CZK/pc/year	4 636	4 355	7 001	5 435	4 037
Pharmaceuticals and disinfectants	CZK/pc/year	84	29	55	7	77
Other direct materials	CZK/pc/year	358	303	850	548	478
Direct material cost in sum	CZK/pc/year	7 564	5 278	9 286	7 268	5 099
Other direct cost and services	CZK/pc/year	478	584	599	394	876
Direct labour expenses including social and health insurance	CZK/pc/year	1 650	1 332	1 924	1 080	1 796
Cost of subsidiary activities	CZK/pc/year	358	602	566	770	1 325
Depreciations of long-term tangible assets	CZK/pc/year	168	310	80	339	62
Depreciations of herd	CZK/pc/year	22	0	0	0	3 132
Indirect cost	CZK/pc/year	2 110	1 920	3 117	2 343	4 935
Total cost	CZK/pc/year	12 350	10 026	15 572	12 194	17 225

which stay in the pastures together with cows, unlike the conventional system linked with different, more expensive, feed technology for calves.

There are similar trends coming out in animal husbandry as they are in plant production considering material costs. These are lower for organic enterprises than for conventional enterprises, the difference coming from different feed costs, namely bought feeds, which comprise a negligible item for organic enterprises. The crucial cost item is own production feed costs, which are lower for organic enterprises. This fact is caused again by the different technologies used by the compared enterprises.

DISCUSSION

Organic agriculture enrolled great expansion especially in the EU countries. A gradual growth of the share of organic agriculture can be seen also in the Czech Republic. Great expansion of organic agriculture in the EU coun-

tries was caused mainly by the EU support policy, which allows for direct financial support for organic farmers as an environment – friendly agriculture systems. The strategy of support policy is a strong motivating factor for farmers, while making decision whether to convert to organic agriculture.

In the Czech Republic, organic agriculture is supported under Government Regulation No. 505/2000, as presented in the Government regulation No. 505/ 2001. This regulation modifies support programs for non-production functions of agriculture, support for activities participating in countryside maintenance, support programs for the LFA. The scope of the support per one hectare of agricultural land is listed below:

– 2 000 CZK for farming on arable land
– 3 500 CZK for hop-gardens, vineyards and orchards
– 3 500 CZK for vegetables on arable land
– 1 000 CZK for grasslands with the exception of vineyards, gardens and orchards.

Organic enterprises also use subsidies under the Government regulation No. 505/2000, which regulates support programs for non-production functions of agriculture, activities participating in countryside maintenance, support programs for LFA. It is possible to get subsidies for grasslands (under the support programs appointed to grassland maintenance on agricultural land, to secure – technologically or organisationally – pastures on agriculture land for cattle and to partially cover the loss caused by farming under organic management) from three different support programs from 2 500 CZK up to 3 100 CZK per hectare.

The most frequently used subsidy program for cattle breeding, often used also by organic farmers, is the program 1. L Beef cows breeding, in this case the subject of support is a calf born from a beef cow. The level of mentioned subsidies granted as a direct irretrievable subsidy depends on the farming region. In the mountaineous regions, the subsidy can be as high as 7 500 CZK, in other less favourable areas as high as 6 500 CZK, or 4 000 CZK in other not mentioned regions. The level of the above listed subsidies represents their maximum volume.

The Czech Republic got closer to the subsidy systems commonly used in the EU countries by using the listed system of subsidy payments.

CONCLUSION

The application of methodology process of costs and revenue analysis on the selected organic enterprise approved the utilisation of the thus compiled methodology process designed for sample file of organic enterprises. The analysis carried out by the research project can bring a valuable knowledge for further decision-making about the potential organic agriculture expansion as one of the multifunctional agriculture forms.

The aid proposals will be formulated due to the results of the above mentioned analysis, which should contribute to support of organic enterprises, to increase the organic land area corresponding with the progress in the EU countries and thereby to help to satisfy the increasing demand for bio-food. Last but not least, it is also the proof, that organic agriculture is truly a functioning part of the multifunctional agriculture.

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