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DEVELOPMENT OF ORGANIC FARMING IN POLAND

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Abstract. The main aim of the article is to characterize development of organic farming in Poland in 2004–2014. The research refers to aspects such as the number and structure of organic producers, the structure of ecological land and organization, and the productivity and profitability of organic farms in comparison to conventional farms. The research shows that since the accession of Poland into the EU, the domestic organic farming sector has developed dynamically. The number of organic producers increased sevenfold in 2004–2014 and the observed changes were caused by an increase in both the number of ecological farms and organic food processing enterprises. Organic and conventional farms clearly differ in terms of organization, productivity and profitability. Conventional farms experienced higher rates of productivity, land profitability, and work profitability. Furthermore, the financial situation of organic farms was vastly determined by state subsidies, which constituted almost 80% of income accrued from agricultural production.

Key words: organic farming, conventional and organic farms, production organization, productivity, profitability, Poland

INTRODUCTION

Modern concepts of agricultural development strongly emphasize the necessity to adjust the level and directions of development of food production to the requirements of consumers creating a growing demand for healthy food. Thus, an important and at the same time strategic goal today is the improvement of the quality of food and the prevention of degradation of the environment where

agricultural production takes place. Moreover, consumers increasingly outline the need for crystallization of decisions in the agricultural and food policy. This results in the changes of these policies introducing a number of legal restrictions for agricultural activities and increased environmental requirements, as well as the promotion and implementation on an increasing scale of production technologies that are friendly for agricultural environment.

Agricultural production using organic methods also fits in with the concept of sustainable development. This is because organic methods of agricultural production comply with the requirements of the soil, plants and animals, while the elimination of agricultural production chemicals, which is associated with the implementation of the control systems of the production process, guarantees the high quality of the products and the protection of the agricultural environment.

As shown by many studies, the demand for organic food is steadily increasing, while the consumers are willing to pay higher prices for organic products than for conventional ones (Gulbicka, 2007). These changes positively affect the development of both the organic food market and the organic agriculture. This is because the increase in demand for organic products translates into the development of the organic food market, which is especially noticeable in developed countries (Łuczka-Bakuła, 2005; 2007). In the EU countries, following a large surplus of demand over supply and as a result of financial support, organic production of food is developing with high dynamics. These processes also occur

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in the agricultural sector in Poland, where the number of organic farms increased from 3760 in 2004 to 25 427 in 2014, i.e. almost 7-fold.

The aim of this article is to present the basic indicators of the development of organic agriculture in Poland in the form of changes in the number and structure of organic producers, changes in the structure of organic farm size and changes in the structure of organic agricultural land. In addition, a comparative analysis of the main indicators of the organization, productivity and profitability of organic farms against conventional farms was carried out.

SOURCE MATERIALS AND RESEARCH METHODS

In the analysis of the development of organic agriculture in Poland periodic reports of IJHARS (Agricultural and Food Quality Inspection) were used (IJHARS, 2015). The reports published by IJHARS contain a variety of information about organic agriculture in Poland, such as the number and structure of organic farms, the number and structure of organic processing entities, and the area and structure of organic agricultural land (IJHARS, 2015). The article also uses statistical data from the national farm accountancy data network (FADN, 2016), containing standard results for organic and conventional farms. On their basis a comparative analysis of conventional and organic farms was conducted, using the average level of characteristics for

these types of farms in 2012, that enabled the identification of differences in conventional and organic production methods. In the analysis, comparisons were made between the level and structure of labour input, the area and structure of agricultural land used, the crop yields, the livestock structure and stocking density, the values and structure of production, the subsidies to business operations and the productivity and profitability of land and labour.

RESEARCH FINDINGS

Changes in the number and structure of organic producers in the years 2004–2014

The development of organic agriculture in Poland until 1998 was very slow due to the impact of many factors, in particular because of the lack of financial support, the strongly limited opportunities to obtain higher selling prices and the poor organization of the market for organic products. Faster development of organic production took place after the introduction of subsidies to farm control costs in 1998 and direct subsidies to the area in 1999, as well as after the statutory regulation of the status of organic agriculture (Komorowska, 2006).

However, a particularly strong momentum of development of organic agriculture in Poland can be observed after 2004, i.e. during the operation within the EU (Table 1). The covering of the domestic agriculture with the subsidy system and the size of the EU sales market

Table 1. Number of organic producers in Poland in 2004–2014 years

Tabela 1. Liczba producentów ekologicznych w Polsce w latach 2004–2014

Years Lata	Total organic producers Producenci ekologiczni ogółem		Organic producers in the agricultural production Ekologiczni producenci rolni		Organic processing companies Przetwórnice ekologiczne	
	number liczba	2004 = 100	number liczba	2004 = 100	number liczba	2004 = 100
	1	2	3	4	5	6
2004	3 760	100.0	3 705	100.0	55	100.0
2005	7 182	191.0	7 183	193.9	99	180.0
2006	9 194	244.5	9 189	248.0	170	309.1
2007	12 121	322.4	11 870	320.4	206	374.5
2008	15 206	404.4	14 896	402.1	236	429.1

Table 1 cont. – Tabela 1 cd.

1	2	3	4	5	6	7
2009	17 423	463.4	17 091	461.3	277	503.6
2010	20 956	557.3	20 582	555.5	293	532.7
2011	23 847	634.2	23 449	632.9	270	490.9
2012	26 376	701.5	25 944	700.2	312	567.3
2013	27 093	720.6	26 598	717.9	407	740.0
2014	25 427	676.3	24 829	670.1	484	880.0

Source: own elaboration based on IJHARS (2015).

Źródło: opracowanie własne na podstawie IJHARS (2015).

Table 2. The structure of organic processing companies in Poland in 2007–2014 (%)**Tabela 2.** Struktura przetwórci ekologicznych w Polsce w latach 2007–2014 (%)

Years Lata	Processing of: – Przetwórstwo:					Production of other agri-food products Produkcja in- nych artykułów rolno- -spożywczych	Other Inne
	fruit and vegetables owoców i warzyw	grain mill products produktów przemiału zbóż	meat mięsa	milk and cheese making mleka i wyrób serów	plant and ani- mal fats tłuszczów roślinnych i zwierzęcych		
2007	28.0	19.0	7.0	2.0	2.0	16.0	26.0
2008	25.0	13.0	5.0	2.0	2.0	27.0	26.0
2009	33.0	21.9	6.6	2.4	2.4	24.3	9.4
2010	32.4	19.4	5.1	2.7	1.3	32.1	7.0
2011	32.0	23.0	6.5	3.0	1.8	25.8	7.9
2012	31.6	23.6	7.0	4.7	2.4	24.8	5.9
2013	29.2	23.8	4.9	3.6	2.7	27.9	7.9
2014	31.4	19.8	7.0	3.1	2.4	27.3	9.0

Source: own elaboration based on IJHARS (2015).

Źródło: opracowanie własne na podstawie IJHARS (2015).

resulted in the increase in the total number of organic producers in the years 2004–2014 from 3760 to 25 427, i.e. 6.8 times. Such significant changes resulted mainly from the increase in the number of organic producers in the agricultural production, and since 2006 they have also been increasingly linked to the remaining group of organic producers, mainly related to food processing. According to data from 2014 (Table 2, Fig. 1), the most

numerous were the companies processing fruit and vegetables (31.4%), grain mill products (19.8%) and other agri-food products (27.38%). Moreover, as it follows from the data contained in Table 2, organic production is increasingly carried out by companies involved in meat processing (7.0%), milk processing and cheese making (3.1%) and production of organic plant and animal fats (2.4%).

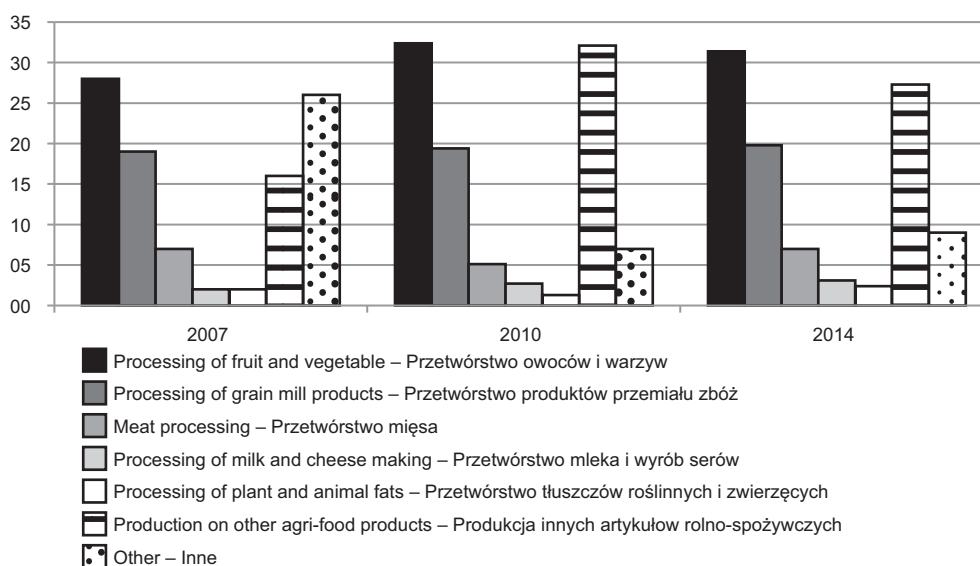


Fig. 1. The structure of organic processing companies in Poland in 2007–2014 (%)

Source: own elaboration based on IJHARS (2015).

Rys. 1. Struktura przedsiębiorstw przetwórstwa ekologicznego w Polsce w latach 2007–2014 (%)

Źródło: opracowanie własne na podstawie IJHARS (2015).

THE STRUCTURE OF ORGANIC FARM SIZE AND THE STRUCTURE OF ORGANIC AGRICULTURAL LAND

Following the significant increase in the number of organic producers in agriculture, the organic agricultural area increased dynamically. The total area of such agricultural land increased in the years 2004–2014 from 104.9 thousand ha to 657.9 thousand ha, i.e. 6.3 times. It can be noticed, however, that the dynamics of growth in organic agricultural land is decreasing. The largest growth in the acreage of such agricultural land took place in the first years after joining the EU. In 2005 compared to 2004, the area of organic agricultural land increased by 58%, and in 2006 compared to 2005 it increased by 38%. In subsequent years, the dynamics of these changes was significantly lower. In 2013 compared to 2012, the area of organic agricultural land increased only by 1.25%, which resulted from the reduction of the agricultural land area during the conversion to organic production. In turn, in 2014 compared to 2013, this area decreased by about 12 thousand ha, i.e. by 1.8%. Also the changes in the structure of the total area indicate the weakening interest in organic production. In the years

2004–2007, the agricultural land in conversion accounted for more than 50% (52–76%) of the organic agricultural land area, while in 2014 it accounted for only 15.5% of this area.

The dynamic changes in the area of organic agricultural land in Poland corresponded to multidirectional changes in the structure of farm size. The data in Table 3 shows that by 2008 the participation of the smallest organic farms (up to 5 ha) was significantly increasing (from 19% to 36%), while the participation of organic farms with the size of 10–20 ha and of 20–50 ha was decreasing (from 26% to 18% and from 18% to 13%, respectively). After 2008, changes in the farm structure proceeded according to another trend. The increase was noticed mainly in the participation of farms with a relatively larger area (10–20 ha and 20–50 ha), while the participation of the smallest organic farms (up to 5 ha) was decreasing. This direction of changes resulted in the significant growth in the average area of an organic farm, which in the period 2008–2014 increased by over 25%, i.e. from 21.1 ha to 26.5 ha. This means that the average size of an organic farm is significantly greater than the average farm size in Poland, which in 2014 was only 10.3 ha (GUS, 2015).

Table 3. The area of organic land in Poland in 2004–2014 (thous. ha)

Tabela 3. Powierzchnia ekologicznych użytków rolnych w Polsce w latach 2004–2014 (tys. ha)

Years Lata	The area of organic land in conversion Powierzchnia ekologicznych użytków rolnych w trakcie konwersji		The area of organic farmland after the conversion period Powierzchnia ekologicznych użytków rolnych po konwersji		The total area of organic agricultural land Ogółem powierzchnia ekologicznych użytków rolnych	
	thous. ha tys. ha	2004 = 100	thous. ha tys. ha	2004 = 100	thous. ha tys. ha	2004 = 100
2004	58.1	100.0	46.8	100.0	104.9	100.0
2005	127.6	219.6	38.7	82.7	166.3	158.5
2006	152.9	263.2	75.1	160.5	228.0	217.3
2007	150.4	258.9	137.1	292.9	287.5	274.1
2008	136.2	234.4	178.7	381.8	314.9	300.2
2009	163.5	281.4	252.8	540.2	416.3	396.9
2010	211.0	363.2	308.1	658.3	519.1	494.9
2011	229.5	395.0	376.0	803.4	605.5	577.2
2012	204.6	352.2	457.1	976.7	661.7	630.8
2013	177.0	304.6	493.0	1 053.4	670.0	638.7
2014	102.0	175.6	555.9	1 187.8	657.9	627.2

Source: own elaboration based on IJHARS (2015).

Źródło: opracowanie własne na podstawie IJHARS (2015).

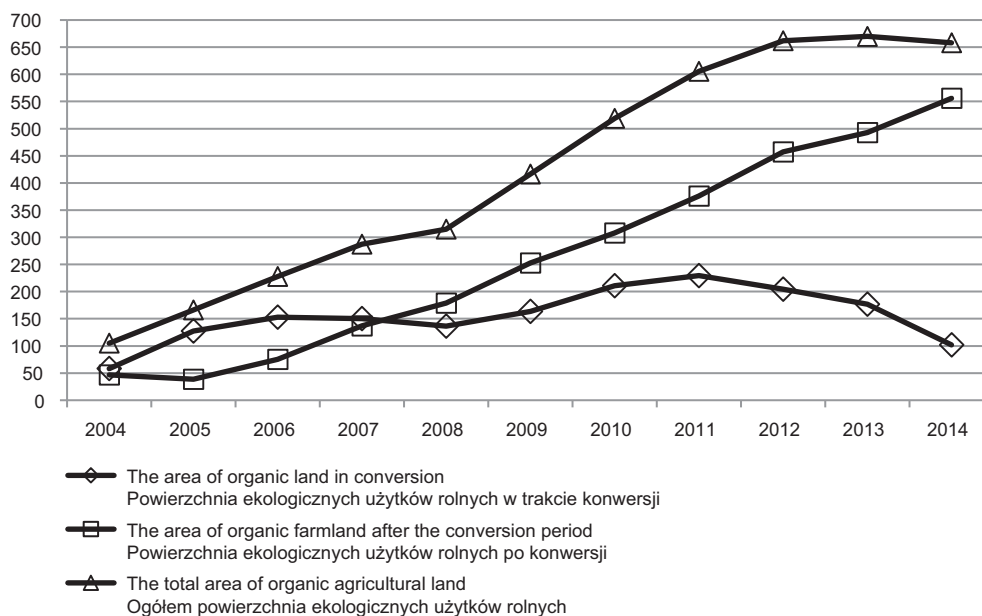


Fig. 2. The area of organic land in Poland in 2004–2014 (thous. ha)

Source: own elaboration based on IJHARS (2015).

Rys. 2. Powierzchnia ekologicznych użytków rolnych w Polsce w latach 2004–2014 (tys. ha)

Źródło: opracowanie własne na podstawie IJHARS (2015).

Table 4. The structure (%) and average size of organic farms (ha) in Poland in 2004–2014

Tabela 4. Struktura (%) i średnia wielkość gospodarstw ekologicznych (ha) w Polsce w latach 2004–2014

Years Lata	<5 ha	5–10 ha	10–20 ha	20–50 ha	50–100 ha	>100 ha	Average area of farms Średnia powierzchnia gospodarstwa
							ha
	%						
2004	19.0	25.0	26.0	18.0	7.0	5.0	27.9
2005	26.0	24.0	24.0	16.0	6.0	4.0	23.2
2006	26.0	26.0	21.0	15.0	8.0	4.0	24.8
2007	28.0	25.0	19.0	15.0	8.0	5.0	24.2
2008	36.5	23.5	18.0	13.0	6.0	3.0	21.1
2009	33.6	22.2	19.3	14.1	7.2	3.7	24.4
2010	23.7	24.3	22.0	16.5	9.0	4.5	25.2
2011	21.1	24.2	23.8	17.1	9.2	4.7	25.8
2012	19.3	24.1	25.5	17.4	9.1	4.6	25.5
2013	18.8	23.7	26.3	17.9	8.9	4.4	25.2
2014	14.5	23.3	28.2	20.3	9.0	4.7	26.5

Source: own elaboration based on IJHARS (2015).

Źródło: opracowanie własne na podstawie IJHARS (2015).

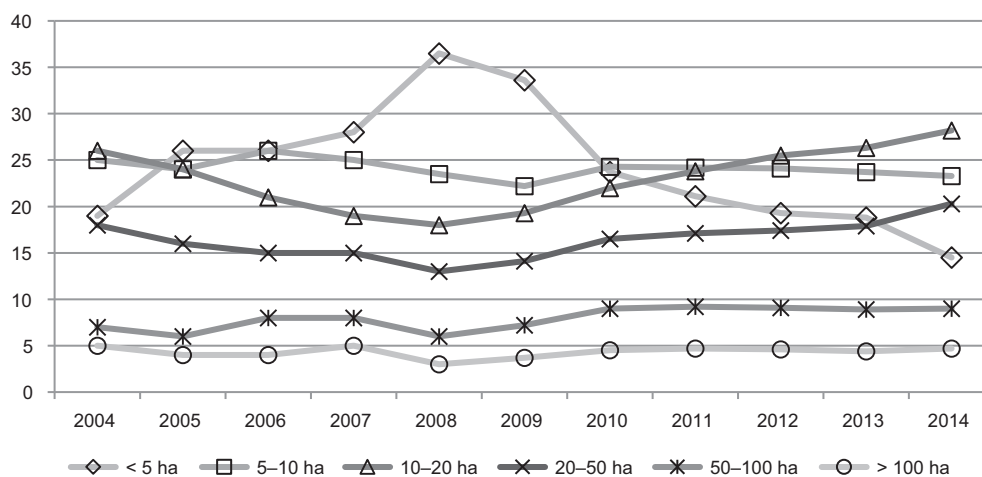


Fig. 3. The structure of organic farms in Poland in 2004–2014 (%)

Source: own elaboration based on IJHARS (2015).

Rys. 3. Struktura gospodarstw ekologicznych w Polsce w latach 2004–2014 (%)

Źródło: opracowanie własne na podstawie IJHARS (2015).

The changes in the number and structure of organic farms in Poland were also connected with significant changes in the structure of the organic agricultural land

use. In the period 2009–2014 (Table 5), there was a significant decrease in the participation of areas of meadows and pastures (from 46.1% to 31.5%), cereals (from

Table 5. Organic land use structure (%) in Poland in 2009–2014

Tabela 5. Struktura użytkowania gruntów ekologicznych (%) w Polsce w latach 2009–2014

Participation in the agricultural area Udział w powierzchni gruntów rolnych (%)	2009	2010	2011	2012	2013	2014
Meadows and pastures – Łąki i pastwiska	46.1	42.3	38.2	35.3	30.2	31.5
Feed plants – Uprawy pastewne	13.0	20.6	28.5	33.7	35.8	35.8
Cereals – Zboża	21.2	19.6	18.1	18.6	18.4	16.9
Fruit and berry crops – Owoce i uprawy jagodowe	16.1	13.3	11.9	8.9	9.5	8.9
Vegetables – Warzywa	0.9	1.0	1.2	1.4	3.7	4.1
Other – Inne	2.7	3.2	2.1	2.1	2.4	2.8

Source: own elaboration based on IJHARS (2015).

Źródło: opracowanie własne na podstawie IJHARS (2015).

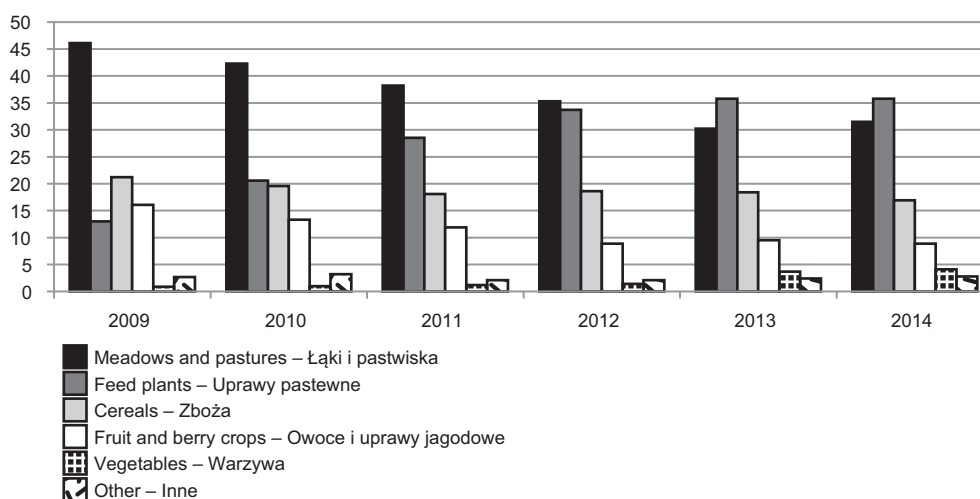


Fig. 4. Organic land use structure in Poland in 2009–2014 (%)

Source: own elaboration based on IJHARS (2015).

Rys. 4. Struktura użytkowania gruntów ekologicznych w Polsce w latach 2009–2014 (%)

Źródło: opracowanie własne na podstawie IJHARS (2015).

21.2% to 16.9%) and fruit and berry crops (from 16.1% to 8.9%), with a simultaneous significant increase in the participation of land used for organic fodder production (from 13.0% to 35.8%) and, although in a distinctly lesser extent, in the participation of land used for vegetable production (from 0.9% to 4.1%). It should be emphasized that still a significant part of land in organic farms in Poland is occupied by grassland. The participation of

this kind of land in those farms is almost 2 times higher than the national average. In turn, as far as cereals are concerned, it should be stated that their participation is almost 3 times lower than the average, primarily because of low yields and often their poor quality due to the lack of effective methods of plant protection. Similar considerations apply to the production of fruit and berry crops and vegetables. Their generally low participation in the

structure of organic crops results mainly from the farms' poor equipment with specialized machinery, which for many of them translates into a very labour-intensive nature of production. Moreover, as emphasized by Kuś and Jończyk (2009), the access to biological plant protection products in Poland is limited, which significantly impedes the reduction of damage caused by pests and diseases.

ORGANIZATION AND ECONOMIC SITUATION OF ORGANIC FARMS AGAINST CONVENTIONAL FARMS

Table 6 compares the basic indicators of economy, organization and economic situation of the total number of organic farms and the total number of conventional farms based on FADN data from 2012 (FADN, 2016). From this comparison it follows that on average, organic farms as compared to conventional farms involved smaller labour resources (1.96 AWU and 2.35 AWU respectively) and applied hired labour on a comparable level, which amounted to 21% and 27%, respectively, of the total labour input. However, taking into account the

farm surface area (39.2 and 48.4 ha), the number of full-time employees per 100 ha of agricultural area is very similar, since it is as follows: 4.9 AWU (conventional) and 5.0 AWU (organic).

Organic and conventional farms are clearly differentiated by the organization of plant production. With smaller resources of land, organic farms cultivated relatively more feed plants (48.4% of agricultural area) and significantly less cereals (34.3% of agricultural area), while in the case of conventional methods those crops constituted 18.3% and 60.4% respectively. The essential differences are noticeable also in crop yields. For conventional farms, wheat yield and maize yield amounted to 52.4 dt/ha and 89.5 dt/ha respectively, while in the case of production using organic methods only 34.3 dt of cereals and about 63 dt of corn were harvested from 1 ha. These differences result in significantly lower income from crop production per area unit in the case of organic farms. For conventional farms, the value of income from crop production from 1 ha amounted to PLN 4 379, while for organic farms it was lower by as much as 58% and amounted to PLN 1 834. The data contained in Table 6 also indicate the substantial differences in the

Table 6. Indicators of organization, productivity and profitability of organic and conventional farms in Poland in 2012 (average values for the total number of conventional and organic farms)

Tabela 6. Wyznaczniki organizacji, produktywności i dochodowości ekologicznych i konwencjonalnych gospodarstw rolnych w Polsce w 2012 roku (wartości przeciętne dla ogółu gospodarstw konwencjonalnych i ekologicznych)

Specification – Wyszczególnienie	Farms – Gospodarstwa	
	conventional konwencjonalne	organic ekologiczne
1	2	3
Family labour input – Nakłady pracy własnej (FWU)	1.71	1.54
Hired labour input – Nakłady pracy najemnej (AWU)	0.64	0.42
Total labour input – Nakłady pracy ogółem (AWU)	2.35	1.96
Total labour input – Nakłady pracy ogółem (AWU/100 ha)	4.9	5.0
Agricultural area (ha), including: Powierzchnia upraw (ha), w tym:	48.4	39.2
cereals – zboża (%)	60.4	34.3
fodder – pastewne (%)	18.3	48.4
permanent crops – uprawy trwałe (%)	1.2	5.0
wheat yield – plony pszenicy (dt/ha)	52.4	34.7
maize yield – plony kukurydzy (dt/ha)	89.5	63.3

Table 6 cont. – Tabela 6 cd.

	1	2	3
Plant production (PLN/ha), including (%): Produkcja roślinna (zł/ha), w tym (%):		4 379.4	1 834.4
cereals – zboża		57.5	43.7
potatoes – ziemniaki		3.8	3.5
sugar beet – buraki cukrowe		5.6	0.0
oilseeds – oleiste		16.0	6.9
vegetables and flowers – warzywa i kwiaty		8.5	19.2
fruits – owoce		4.2	11.1
fodder – pastewne		1.3	4.7
Stocking density – Obsada zwierząt (LU/ha)		1.6	0.5
Animals total (units), including (%): Liczba zwierząt (sztuki), w tym (%):		31.8	14.7
cattle – bydło		45.0	58.8
pigs – trzoda chlewna		48.4	18.9
poultry – drób		5.7	13.9
Milk yield of cows (litres) – Mleczność krów (litry)		6 052	3 394
Animal production (PLN/LU), including (%): Produkcja zwierzęca (zł/LU), w tym (%):		4 708	3 175
milk and products from cow's milk – mleko i przetwory mleczne		36.9	25.2
beef and veal – wołowina i cielęcina		11.7	25.0
pork – wieprzowina		39.6	20.7
eggs – jajka		2.2	26.6
Land productivity (value added in PLN/ha) Produktywność ziemi (wartość dodana w zł/ha)		3 959	2 939
Labour productivity (value added in PLN/AWU) Wydajność pracy (wartość dodana w zł/AWU)		81 934	58 813
Land profitability (farm income in PLN/ha) Dochodowość ziemi (dochód z gospodarstwa w zł/ha)		2 510	2 046
Work profitability (farm income in PLN/FWU) Dochodowość pracy (dochód z gospodarstwa w zł/FWU)		71 077	52 111
Share of subsidies in farm income (%) Udział dopłat w dochodzie z gospodarstwa (%)		47.2	78.8

Source: FADN (2016).

Źródło: FADN (2016).

structure of income from plant production. Although for both types of farms the main income was derived from the production of cereals (57.5% and 43.7%), it is easy to notice that in the case of organic farms this income is

relatively strongly determined by the production of vegetables and flowers (19.2%) and the production of fruit (11.1%). In turn, for conventional farms the high rank of income from cereal production is primarily attributable

to the relatively high participation of income from the production of oilseeds, mainly rape (16.0%).

Significant differences between organic and conventional farms are also noticeable in animal production. For organic farms, this branch of agricultural production is of significantly less importance, which is indicated by a low stocking density (0.5 LU/ha). On the other hand, considering the structure of livestock, it can be seen that in organic production as compared to conventional production cattle raising (58.8%) and poultry raising (13.9%) play a more prominent role. However, the animal productivity on organic farms is significantly lower. For example, the average cow milking capacity on conventional farms amounted to 6052 litres, while on organic farms it was only about 3394 litres. The generally low productivity of this branch of production on organic farms is also demonstrated by the value of animal production per livestock unit (PLN/LU). For conventional production this value amounted to PLN 4708, while for organic production it was lower by as much as 32.5% and amounted to PLN 3175.

The above differences in the organization and productivity of plant and animal production translate into significant differences in productivity measured with the added value and in the profitability of farms. From the data in Table 6 it follows that the land productivity (PLN 3959/ha) and labour productivity (PLN 81 934/AWU) were higher for conventional farms by 35% and 39% respectively, and thus resulted in significantly higher levels of income per area unit (PLN 2510/ha) and labour input (PLN 71 077/FWU). This means therefore that the average profitability of land (PLN 2046/ha) and labour (PLN 52 111/FWU) for organic farms as compared to conventional farms was lower, by more than 18% and 27% respectively. It should be emphasized that the income situation of organic farms is highly determined by the instruments of the Common Agricultural Policy of the European Union. The share of subsidies in organic farm income in 2012 amounted to 78.8%, while for conventional farms it amounted to less than 50% (47.2%).

SUMMARY

In the period of the operation of Poland within the EU, a particularly strong momentum of development of organic agriculture can be observed. The covering of the domestic agriculture with the subsidy system and the size of the EU sales market resulted in almost 7-fold

increase in the total number of organic producers in the years 2004–2014. These changes were also accompanied by the ever stronger connection with the remaining group of organic producers, mainly those related to food processing. The dynamic changes in the number of organic producers and the organic agricultural area in the Polish agriculture corresponded to the changes in the structure of farms. By 2008, the participation of the smallest organic farms (up to 5 ha) was significantly increasing, while the participation of farms with the size of 10–20 ha was decreasing. After 2008, changes in the farm structure proceeded according to another trend. The increase was noticed mainly in the participation of farms with a relatively larger area (>10 ha), while the participation of the smallest organic farms (up to 5 ha) was decreasing. This direction of changes resulted in the significant growth in the average area of an organic farm.

Organic and conventional farms strongly differ from each other in terms of productivity and profitability. The productivity of land and labour measured by the added value was higher for conventional farms, by 35% and 39% respectively, while the profitability of land and labour for organic farms as compared to conventional farms was lower by more than 18% and 27% respectively. Moreover, the income situation of organic farms in Poland is highly determined by the subsidies, which accounted to nearly 79% of the farm income. This means that without financial support the organic agriculture is not able to function, and thus effectively compete with conventional agriculture.

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ROZWÓJ ROLNICTWA EKOLOGICZNEGO W POLSCE

Streszczenie. Głównym celem pracy była charakterystyka rozwoju rolnictwa ekologicznego w Polsce w latach 2004–2014. Analizowano liczbę i strukturę producentów ekologicznych, strukturę gruntów użytkowanych metodami ekologicznymi oraz organizację, produktywność i dochodowość gospodarstw ekologicznych na tle konwencjonalnych. Badania wykazały, że w okresie funkcjonowania w ramach UE rolnictwo ekologiczne w Polsce dynamicznie się rozwijało. W latach 2004–2014 liczba producentów ekologicznych wzrosła ogółem prawie 7-krotnie, a zmiany te wynikały zarówno ze wzrostu liczby gospodarstw ekologicznych, jak i przedsiębiorstw przetwórstwa ekologicznego. Gospodarstwa ekologiczne i konwencjonalne znacznie różnią się pod względem organizacji, produktywności oraz dochodowości. Gospodarstwa konwencjonalne uzyskiwały znacząco wyższy poziom produktywności oraz dochodowości ziemi i pracy. Ponadto sytuacja ekonomiczna gospodarstw ekologicznych była istotnie determinowana przez subwencje, które stanowiły blisko 80% wartości dochodu uzyskiwanego z produkcji rolniczej.

Słowa kluczowe: rolnictwo ekologiczne, gospodarstwa konwencjonalne i ekologiczne, organizacja produkcji, produktywność, dochodowość, Polska

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