STOWARZYSZENIE EKONOMISTÓW ROLNICTWA I AGROBIZNESU
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THE PRODUCTION OF OILSEED RAPE IN POLAND IN VIEW OF THE NATIONAL INDEX TARGET

PRODUKCJA RZEPAKU W POLSCE W ODNIESIENIU DO NARODOWEGO CELU WSKAŹNIKOWEGO

Key words: areał uprawy rzepaku, biopaliwa
Słowa kluczowe: the area of the oilseed cultivation, biofuels

Abstract. Among liquid biofuels the most practical meaning has the biodiesel production from vegetable oil. The European Union has been introducing regulations that oblige fuel corporations to use admixture of biofuels in petrol and diesel fuel oil. That is why, the demand for the rapeseed oil is dynamically increasing. In order to cope with the market's challenges, Poland must increase (almost twice) the acreage of the rape sowing similarly to other European countries. The research conducted among rape manufacturers in Western Pomeranian province indicate that the growth of the rape participation in the structure of sowings, and plans for next years assume its expansion to more than 30%.

Introduction

During the energy crisis of the 70's attention was paid to alternative fuels mainly in places where the crude oil products were used.

From among liquid biofuels the most practical meaning (beside applying the addition of ethyl alcohol to crude oil) has the production of biodiesel from vegetable oils. The European Union has introduced regulations that oblige fuel corporations to use admixture of biofuels in petrol and diesel fuel oil. This causes dynamically increasing demand for the oilseed grain. On the other hand, it breeds the need to estimate productive capacity of this plant in Poland and the European Union.

The production of oilseed rape in Poland in connection with the European Union

Rapeseed is the basic oil plant that is grown in Western and Central Europe. In Europe total area of growing oil plants rapeseed share amounts to 80% whereas in Poland it exceeds 95%. In four countries (Germany, France, Poland and Great Britain) 70% of oilseed rape production in the whole European Union is grown [Kruszyński et al. 2008].

Table 1. The oilseed rape growing area
Tabela 1. Powierzchnia zasiewu rzepaku

Country/ ***Kraj***	**Area [thous. ha]/** ***Powierzchnia [tys. ha]***				**Percentage changes 2009/2008/** ***Zmiana procentowa 2009/2008***
	2004-2008	**2007**	**2008**	**2009**	
Germany/*Niemcy*	1395	1548	1371	1471	7.3
France/*Francja*	1361	1618	1421	1459	2.7
Poland/*Polska*	656	797	771	810	5.1
Great Britain/*Wielka Brytania*	600	681	598	530	-11.4
Other countries/*Pozostałe kraje*	1509	1924	2042	1997	-0.2
EU27/*EU27*	5521	6568	6203	6267	1.0

Source/*Źródło:* Public Information... 2009

In production, there is the dominance of winter kinds of rapeseed that give definite larger and more regular crops than the spring ones [Kuś 2007]. One should remember that towards growing demand on rapeseed oil from the side of fuel industry, European countries will enlarge acreage of the rape production. The table presented below illustrates the estimation of the rape production accomplished by the European Oilseed Alliance.

Before the Poland's accession to the European Union, with little fluctuations the oilseed rape acreage amounted little more than 400 thousand hectare. The area of rape cultivation has been growing distinctly in Poland since 2003 (Fig. 1). It was influenced by the fact that rapeseed prices were on a profitable level as compared with the cereal prices. 2007 was the record-breaking when rapeseed was grown by 4% (more than 78 thous. of farms) [Dzwonkowski et al. 2009].

In 2008, the interest in oilseed rape production was smaller due to less profitable price reports to cereals. Total demand on rapeseed oil is consumed on groceries and the energetistic prognose until 2013 requires the growth of the rape production from 1.5 million tone (average in five-year period 2003-2007) to 3.2 million tone in 2013 (Tab. 3). The achievement of so significant growth of the rape's production, especially in so short period of time, will be extremely difficult. It is because of the fact that rapeseed is a plant which demands both: huge soil requirements as well as climatical once. Furthermore, it "competes" about the sowing ground with beetroot, wheat and different cereals with high efficiency from the cultivation area (maze, barley).Therefore, it is predicted that the enlargement of the rapeseed acreage will follow above all at the expense of cereals. It means that in the perspective till 2013 one will have to withdraw about 300-350 hectares of the cereal production.

Table 2. The potential of the rape's production in the European Union countries
Tabela 2. Potencjał produkcji rzepaku w Unii Europejskiej

Country/*Kraj*	**The area of cultivation [thous. ha]/ *Powierzchnia uprawy [tys. ha]***	
	2006	**the potential in 2020/ *potencjał w 2020 r.***
Poland/*Polska*	620	1 200
Germany/*Niemcy*	1 430	1 800
France/*Francja*	1 400	2 000
Great Britain/*Wlk. Brytania*	570	700
EU 25/*UE 25*	5 300	7 800
EU 27/*UE 27*	5 400	8 400
Russia/*Rosja*	540	1 500
Ukraine/*Ukraina*	390	1 200
Turkey/*Turcja*	0	200

Source/*Źródło:* The study of... 2007

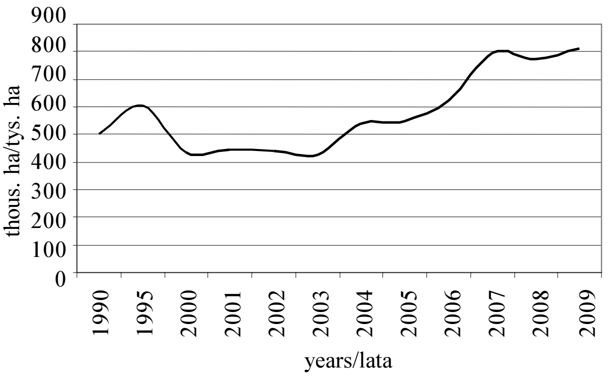

Figure 1. The area of the oilseed rape cultivation in Poland in 1990-2009
Rysunek 1. Powierzchnia upraw rzepaku w Polsce w latach 1990-2009
Source: Central Statistical Office of Poland [www.stat.gov.pl]
Źródło: dane GUS [www.stat.gov.pl]

It does not have to lead to the cereals' production fall. Because of the huge part of cereals in the surface sowings (over 73% in 2007) [www.stat.gov.pl], the growth of rape sowing acreage will improve the economy of the rotation of crops and it will contribute to the growth of their crops without any costs [Rosiak 2008]. Moreover, large possibilities of the growth of cereals crops (and rape) are possible if the improvement of agricultural science[1] (appropriate fertilization, full plants protection, the Osage of qualified sowing material etc.) and the growth of farmers' qualifications and skills appear.

There are many other factors that decide if the farmer wants to deal with rape cultivation, for example: profitability of their production comparing with wheat. It is because both of these plants "compete" about the ground. As it results from the comparison of the value of production costs and income, the oilseed rape cultivation is economically more profitable than wheat (except from 2007 when the breaking-record cereals process was noted down). Rape cultivation for the sake of not only high soil requirements but also technically – organized requirements causes that small number of farms deals with it (Tab. 5).

[1] Appropriate fertilization, „full plants" protection, the usage of qualified sowing material etc.

Table 3. The oilseed rape demand
Tabela 3. Popyt na rzepak

Specifications/ ***Wyszczególnienie***	**Unit/** ***Jedn.***	**Rape demand in years/*Popyt na rzepak w latach***			
		2008	**2009**	**2010**	**2013**
The rape's demand for grocery aims/ *Popyt na cele przetwórstwa spożywczego*	thous. t/ *tys. t*	1 000	1 000	1100	1 200
Consumption ON/*Spożycie ON*		8 500	9 400	10 300	12 000
Shares of esters ON/*Udział estrów ON**	%	3.45	4.60	5.75	7.10
The Reed on esters/*Estry*	thous. t/ *tys. t*	324	477	654	796
The rape's demand for energetistic aims/ *Na cele energetyczne*		809	1 193	1 634	1 989
Total demand for rapeseed/ *Ogółem popyt na rzepak*		1 809	2 193	2 734	3 189

* Share according to the energestic value of fuels, in accordance with the National Index Target/*Udział zgodny z energetyczną wartością paliw, zgodnie z Narodowym Celem Wskaźnikowym*
Source/*Źródło*: Rosiak 2008

Table 4. The comparison of profitability of the rape and wheat production
Tabela 4. Porównanie dochodowości produkcji rzepaku i pszenicy

Specification/ ***Wyszczególnienie***	**Production of rape and wheat [PLN/ha]/** ***Produkcja rzepaku i pszenicy [zł/ha]***				
Winter rape/*Rzepak ozimy*					
The cost of production/*Koszty produkcji*	2435	2822	2904	4008	3598
Total costs/*Koszty ogółem*	1827	2258	2396	2975	3303
Direct aid/*Dopłaty bezpośrednie*	507	586	593	627	888
Total income/*Zysk*	1115	1150	1102	1 660	1182
Winter wheat/*Pszenica ozima*					
The cost of production/*Koszty produkcji*	1526	2186	4145	3185	2634
Total costs/*Koszty ogółem*	1328	1759	892	2391	2598
Direct aid/*Dopłaty bezpośrednie*	507	579	596	608	864
Total income/*Zysk*	705	1006	2849	1402	900
Rape/wheat relations/*Relacja rzepaku do pszenicy*					
The cost of production/*Koszty produkcji*	1.60	1.29	0.70	1.26	1.36
Total costs/*Koszty ogółem*	1.37	1.28	1.27	1.24	1.27
Direct aid/*Dopłaty bezpośrednie*	1.00	1.01	0.99	1.04	1.03
Total income/*Zysk*	1.58	1.14	0.39	1.18	1.31

* 2006, 2008 The actual data, 2005, 2007 and 2009 the estimated data/*lata 2006 i 2008 dane rzeczywiste, 2005, 2007 i 2009 dane szacunkowe*
Source/*Źródło:* Rynek oleistych… 2009

According to agricultural list from 2002, rapeseed in Poland was grown on less than 43 thousand farms. After the Poland's accession to the European Union, when rapeseed started to be perceived as a plant which cultivation is highly profitable, the number of its manufacturers almost doubled[2]. Even small farms started to be interested in rape cultivation and in consequence almost triple growth of the number of manufacturers in the area group from 1-5 ha was noticed and almost double on farms from 5-10 ha. Furthermore, the number of rapeseed manufacturers possessing 50 ha and more agricultural uses has enlarged but in smaller degree if compared with the "small" producers of rapeseed.

In 2002, the percentage of farms dealing with rape's cultivation amounted to 1.4% in 2005, 2% it made up already 3% 2007 during 5 years it enlarged almost twice (Tab. 6).

The above mentioned table shows that the rape cultivation is the domain of large farms. The growth of rape's cultivation area was accompanied in small degree by the process of improving the

[2] Appropriate fertilization, „full plants" protection, the Osage of qualified sowing material etc.

Table 5. Number of farms dealing with rapeseed (according to area groupings)
Tabela 5. Liczba gospodarstw z uprawą rzepaku (według grup obszarowych)

Specifications/ *Wyszczególnienie*	2002	2005	2007	2002	2005	2007
	number of farm/ *liczba gospodarstw*			[%]		
Overall in area groupings (agricultural use grounds) [ha]/ *Ogółem, w tym w grupach gospodarstw [ha]:*	42 982	54 560	78 287	100	100	100
< 1	3 702	1 302	1 814	8.6	2.4	2.3
1-5	4 305	8 938	15 475	10.0	16.4	19.8
5-10	6 740	9 160	14 906	15.7	16.8	19.0
10-20	10 620	13 197	18 097	24.7	24.0	23.1
20-50	10 945	13 638	17 135	25.5	25.0	21.9
50-100	3 344	4 404	6 190	7.8	8.1	7.9
> 100	3 326	4 009	4 671	7.7	7.3	6.0

Source: Central Statistical Office of Poland [www.stat.gov.pl]
Źródło: dane GUS za lata 2002-2007 [www.stat.gov.pl]

production structure since the average acreage falling to one farm in 2007 was similar to the one in 2002.

The average area of the rape cultivation on farms area from 1 to 10 ha has practically not changed (or the change was minimal). The distinct growth was recorded on larger farms, especially on those from 50 to 100 ha where the average acreage of rape grown enlarged nearly to 37%.

State and perspectives of the rape cultivation in West Pomeranian Voivodeship

West Pomeranian province is one from four other provinces (Kuyavian-Pomeranian, Greater Poland, Lower Silesian) where the rape's cultivation in 2009 exceeded the acreage of 100 thousand ha.

Farm owners plan further growth of oilseed rape in structure of sowings from 21 to 35.5% in 2010 (Tab. 8). So high share of rapeseed results from limitation of animal production on large farms where the rapeseed performs also a role as a phitosanitary plant since cereals in sowings structure occupy on average 75%.

In 2009 a survey was conducted among the rape's manufacturers from West Pomeranian province. To the survey, twenty farms from five area groupings were chosen at random. (10-50 ha, 50-100 ha, 100-300 ha, 300-500 ha and more than 500 ha). The respondents answered among other things to questions connected with the scale of the rape's cultivation in 2007 and 2008 and their future plans including rape sowings in 2009 and 2010. The achieved results are included in Table 8.

Table 6. Farms share – the rape manufacturers in the overall number of farms
Tabela 6. Udział gospodarstw specjalizujących się w produkcji rzepaku w ogólnej liczbie gospodarstw

Specifications/ *Wyszczególnienie*	2002	2005	2007
	farms share [%]/ *udział gospodarstw [%]*		
Overall in area groupings agricultural use grounds:/ *Ogólnie, w tym w grupach gospodarstw:*	1.4	2.0	3.0
< 1	0.4	0.1	0.2
1-5	0.4	0.9	1.5
5-10	1.6	2.4	3.7
10-20	4.0	5.3	7.4
20-50	11.4	13.7	16.7
> 50	16.8	20.5	25.7

Source: see tab. 5
Źródło: jak w tab. 5

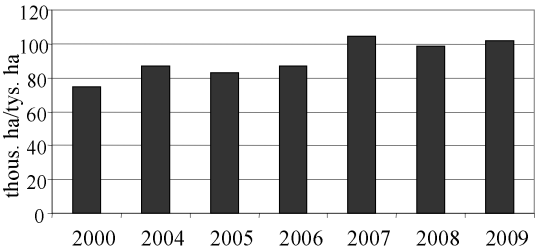

Figure 2. The area of the rape cultivation in West Pomeranian province
Rysunek 2. Powierzchnia upraw rzepaku w woj. zachodniopomorskim
Source: see tab. 5
Źródło: jak w tab. 5

Table 7. The average surface of rape's cultivation in area groupings farms
Tabela 7. Średnia powierzchnia upraw rzepaku w grupach gospodarstw w zależności od ich wielkości

Specifications/ ***Wyszczególnienie***	**2002**	**2005**	**2007**	**2002**	**2005**	**2007**
	***area/powierzchnia* [ha]**			**2002=100**	**2005=100**	**2002=100**
Overall in area groupings (agricultural use grounds) [ha]/ *Ogółem, w tym w grupach gospodarstw [ha]:*	10.21	10.08	10.18	98.7	100.9	99.6
< 1	0.06	0.62	0.56	1037.8	90.5	938.8
1-5	1.45	1.42	1.38	98.2	96.6	94.9
5-10	2.18	2.27	2.44	104.4	107.2	111.9
10-20	3.07	3.30	3.79	107.7	114.7	123.5
20-50	5.53	5.93	7.34	107.3	123.9	132.9
50-100	12.10	13.32	16.56	110.1	124.3	136.8
> 100	85.49	83.08	94.47	97.2	113.7	110.5

Source: see tab. 5
Źródło: jak w tab. 5

Table 8.The rape sowings – trends in West Pomeranian province (2007-2010)
Tabela 8. Powierzchnia zasiewów rzepaku w woj. zachodniopomorskim w latach 2007-2010

Number of farms/ ***Liczba gospo-darstw***	**Area groupings/** ***Udział w grupie obszarowej***	**Area of arable land/** ***Grunty orne***	**The acreage of rapeseed in the investigated farms/** ***Powierzchnia zasiewów rzepaku w badanych gospodarstwach***							
			2007		**2008**		**2009**		**2010**	
			ha	**%**	**ha**	**%**	**ha**	**%**	**ha**	**%**
20	10-50	588	112	19	120	24.4	136.5	23.2	134	22.8
20	51-100	1 339	352	26.3	417	31.1	426	31.8	476	35.5
20	101-300	3 046	845	27.8	911	29.9	960	31.5	940	30.9
20	301-500	7 056	993	14.1	1 133	16.1	1 419	20.1	1 479	21.0
20	>500	18 957	5 081	26.8	4 564	24.6	6 559	34.6	6 440	33.9
Razem/*Total*		30 986	7 383	23.8	7 145	23.1	9 500.5	30.1	9 469	30.1

Source: own study
Źródło: opracowanie własne

On the investigated farms, as in the case of the whole country and provinces, the acreage of the rape sowing fell (about 238 ha – 3.2%) in 2008 compared with 2007. However, there is one difference visible, while in the country small farms reduced sowings, in West Pomeranian province the acreage of sowings was limited on farms above 500 ha.

Situation radically changed in 2009 when the owners of the investigated farms planned to enlarge the rape acreage to 2355.5 ha (33%) compared with 2008. The increase of sowings' acreage was planned by owners and farm users in each investigated area groupings. In the next year (2010) the area of rapeseed will stay on the similar level (decrease on 100 investigated farms is planned up to 0.04%) . Farms from the area groupings 10-50 ha are going to lower their sowings to 0.4%, 101-300 ha to 0.6% and 500 ha to 0.7%. Owners and farm users from 51-100 ha have planned the increase of the rape sowing area up to 3.7%.

For reasons of a situation on the rape market (including good prices and the growing demand from fuel industry), the trend seems to be permanent, which is coherent with the necessity of the growth of rape's production (from 1.5 million tone in 2007) to 3.2 million tone in 2013.

Conclusions

The only possible way ,which will in the closest years lead to such acreage of sowings to satisfy the increasing demand on the rapeseed oil in the grocery and fuel industries, is the improvement of rape's participation in the sowings structure.

This trend is visible at the diagrams showing the area of the rape sowing in Poland (the increase about 5.1% in 2009 compared with 2008) and in West Pomeranian province 3.6% growth. These changes ,however, are not as clear as in case of the investigated farms.

On the researched farms, in the time period from 2007 to 2010, the acreage of the rape sowings in the structure of sowings (on arable grounds) raises from 23.8 to 30.06%.

Bibliography

Dzwonkowski W., Łopaciuk W., Krzemiński M. 2009: The influence of legal,economic environmental conditioning as well as changes intervening on the world's market on the development of the cereals' market, the oily and high-protein plants in Poland. Institute of Agriculture and Food Economics-Public Information Bulletin Warsaw. [www.minrol.pl], 05.08.2009.

Kruszyński St., Boryca J., Chruściel J. 2008: Oilsed rape as a source of clean energy. *Clean energy*, 4, 24-25.

Kuś J. 2007: Possibility conditions of the growth of rape's production on energetistic aims in Lower Silesian Voivodeship. Material from Conference Renewable sources of energy in Lower Silesian Voivodeship – the promotion and development possibilities. Lublin, December.

Production, costs and incomes of chosen agricultural products from 2002 to 2005. 2006: Institute of Agriculture and Food Economics. Public Information Bulletin Warsaw. Warsaw.

Production, costs and incomes of chosen agricultural products from 2006 to 2007. 2008: Institute of Agriculture and Food Economics. Public Information Bulletin Warsaw. Warsaw.

Public Information Bulletin on basis of Oil Word data no. 38/2009. The rape's market- state and perspectives, no. 36/2009, 10. 2009: IERiGZ-PIB, Warszawa.

Rosiak E. 2008: Rapeseed market in the country in 2008/09. Bayer CropScience Magazine for modern farmer, 2, 7.

Rynek oleistych w Polsce. Rynek rzepaku. Stan i perspektywy, listopad 2009, IERiGŻ, Warszawa.

The market of oily plants in Poland. The rape's market – the state and perspectives. 2009: Institute of Agriculture and Food Economics. Public Information Bulletin, Warsaw. November, 36, 10.

The study of Institute of Agriculture and Food Economics based na data of European Oilseed Alliance. 2007: [www.stat.gov.pl].

Streszczenie

Unia Europejska wprowadziła wymóg dodawania biopaliw do benzyny i oleju napędowego. Dlatego popyt na olej rzepakowy dynamicznie rośnie. Aby sprostać wyzwaniom rynku Polska musi zwiększyć (prawie dwukrotnie) areał zasiewu rzepaku podobnie jak w innych krajach europejskich. Artykuł przedstawia produkcję rzepaku w Polsce w latach 2004-2009 i możliwości jej zwiększenia do rosnącego popytu. Badania przeprowadzone wśród producentów rzepaku w woj. zachodniopomorskim wskazują, na trend wzrostowy udziału rzepaku w strukturze zasiewów, a plany na najbliższe lata zakładają ekspansję na więcej niż 30%.

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