STOWARZYSZENIE EKONOMISTÓW ROLNICTWA I AGROBIZNESU
Roczniki Naukowe ● tom XI ● zeszyt 6

Anna Kołodziejczak

Adam Mickiewicz University,Poznan, Poland

INTEGRATED AGRICULTURE IN POLAND

ROLNICTWO ZINTEGROWANE W POLSCE

Key words: integrated agriculture, integrated production

Słowa kluczowe: rolnictwo integrowane, produkcja integrowana

Abstract. The article addresses theoretical aspects of integrated agriculture (the concept, goals) and presents the results of studies of spatial differences in the application of integrated production by farmers in Poland in the years 2004-2006.

Introduction

Poland's accession to the European Union has given its agriculture new chances of solving many of its economic and social problems. The Common Agricultural Policy, introduction of direct payments, regulation of the farming market, and programmes of countryside development have brought about many changes, not only in the country's farming systems and tendencies of agricultural production, but also in the broadly understood performance of rural areas. An important role in the shaping of rural areas is played by their farming systems. One of them is integrated agriculture, which chiefly denotes plant production intended to yield food of competitive (high) quality at a moderate price while satisfying environmental restrictions and not pushing up rural unemployment unduly. In the opinion of Baum and Wielicki [2005], in Polish agriculture at present this system is a compromise with the idea of sustainable development and seems to be an optimum solution in the current socio-economic conditions.

The aim of this paper is to assess the contribution of the integrated farming system to regional differences in agriculture in the years 2004-2006. Because of the introduction of other farming systems emphasising environmental protection and preservation of the agricultural landscape, like organic and sustainable ones, conventional farming – the basic system in our country - was disregarded in the research. During the study period, a factor significant for the development of organic and sustainable farming was payments under the EU Support for Agri-environment and Animal Welfare Programme within in the Rural Development Plan for the years 2004-2006.

The conception of integrated agriculture

The concept of integrated agriculture appeared in countries with a high level of chemicalisation of farming. The widespread use of plant protection products and large dozes of mineral fertilisers in conventional farming enhanced cropping, but in a longer time perspective posed a threat to the natural environment and to consumers seeking safe, high-quality foodstuffs.

Through a controlled increase in outlays, integrated agriculture seeks to obtain good quality crops without disturbing the natural environment; hence, it is not the same as extensive farming. In publications on farming systems [König et al. 1989, Kuś, Fotyma 1992, Kośmicki 1993, Sołtysiak 1994, Zimny 2007], it is one of the three models, together with conventional and organic ones, fulfilling the principles of sustainable development and hence belonging to sustainable agriculture. Sustainable agriculture, however, is a much broader concept than integrated agriculture. As Runowski [1996] states it, sustainable agriculture refers to such farming systems, which ensure a simultaneous achievement of productive, economic, ecological and social goals. Its aspect considered in the Good Farming Practice Code [2004] is integrated pest management.

In the opinion of Kuś [1995], integrated agriculture is a farming system, which ensures the achievement of economic and ecological targets through a discerning use of modern production techniques, systematic improvement of management, and implementation of various forms of biological progress in a way conducive to those targets.

A more detailed explanation of the conception of integrated agriculture can be found in Kośmicki [1993], who describes it as a 'milder' type of agriculture because the use of agrochemicals is

more limited here than in conventional farming. Preference is given to interrelated measures, while pests are fought following recommendations of a plant protection service rather than those of agrochemical producers. Crop cultivation is adjusted to habitat conditions. Measures employed include crop rotation and harmonised fertilisation.

Integrated production is a combination of Good Farming Practice (a farming system compatible with the laws of nature), integrated pest management (a combination of cultivation measures, both biological and chemical, keeping pests below economically harmful levels), and biological progress (introduction into cultivation of species and varieties highly resistant to diseases and pests).

The usefulness of integrated technologies and the universality of this model of agricultural production has not only attracted the interest of scientists, advisory bodies and producers, but also moved many countries to introduce certification systems and controlled conditions for such technologies. Products obtained in accordance with the principles of integrated production have a special marking confirming their high quality and safety for the consumer. In Poland, a system of integrated production has been established and recorded in the Plant Protection Act of 18 December 2003 [Ustawa *o ochronie roślin,* Dz.U. no. 11/2004, position 94, with later changes], in which the powers of supervising integrated production, issuing certificates, and controlling certified crops rest with the State Inspectorate of Plant Health and Seed Production. Integrated production requires the farmer to observe the principles and procedures established for the cultivation of a given crop. The basic rule of this system is that he should follow the instructions and keep a record of the entire production process. For each plant, a detailed instruction should be provided listing production requirements, viz. selection of a suitable cultivar in terms of pest resistance, high-quality sowing material, producer's knowledge of the most dangerous pests as well as toxicity thresholds for a pest and a region, selection of registered pest control products, selection of the right dose and application time, protection of useful organisms (bees, ladybirds, etc.), and testing products for their nitrate and heavy metal content.

Assessment of spatial differences in integrated agriculture

Integrated production in Poland was first designed and implemented in fruit-farming. In 2006 there were a total of 22 instructions for integrated growing of crops, primarily fruits and vegetables. A grower relying on integrated pest management and a balance between technological and biological progress can apply for a certificate issued by a suitable regional Inspectorate of Plant Health and Seed Production for the period of 12 months.

Farmers are not too interested in integrated production. In the years 2004-2006, for a total of 136746 crops reported on 8864 farms, only 4259 certificates were issued (Table 1). The area of certified crops covered 26 661 ha, or 0.17% of agricultural land. The highest proportion of agricultural land (over 0.2%) under integrated production could be observed in the fruit- and vegetable farming regions of the voivodeships of Świętokrzyska Land (0.53%), Mazovia (0.38%), Kujavia-Pomerania (0.29%), and Łódź (0.26%).

Little interested in integrated production were farmers from the voivodeships of Opole, Podlasie, Lower Silesia, Lubuska Land and Podkarpacie, in which the area of certified crops did not exceed 0.05% of agricultural land (Fig. 1).

In the years 2004-2006, the most extensive fruit-growing area was occupied by apple trees (21 178 ha) and sour cherries (1054 ha), and in the group of berries, strawberries (1989 ha) and currants (857 ha); the leaders among vegetables were onions (356 ha), carrots (263 ha) and cauliflowers (169 ha).

To determine the introduced types of farming systems that are environmentally friendly and preserve the agricultural landscape, use was made of the successive quotient method [Biegajło 1973]. Taking into consideration the area of agricultural land under integrated, sustainable and organic types of cultivation, the following 8 types were distinguished on the basis of the six highest successive quotients:

I – dominance of organic production (O6): this farming system was conspicuous in the voivodeships of Lubuska Land, Lublin, Małopolska and West Pomerania,

II – leading organic production of supplemented production (O5S1): Lower Silesia, Silesia, Podkarpacie and Podlasie,

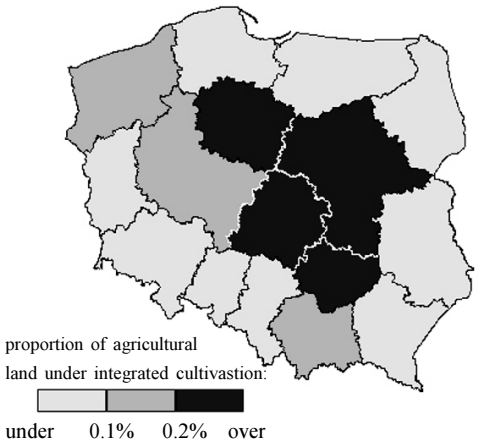
III – leading organic production supplemented by integrated production (O5I1): Mazovia and Wielkopolska,

IV – leading organic production supplemented by sustainable production (O4S2): Opole and Warmia-Mazuria,

Table 1. Farms engaged in integrated agriculture in Poland in the years 2004-2006

Voivodeship	Number of			Certified		
	submitted		certificates issued	area [ha]	per cent	
	farms	crops			farms	AL
Lower Silesia	597	385	89	473	0.30	0.05
Kujavia-Pomerania	689	1170	360	2992	0.80	0.29
Lublin	102	1235	256	1373	0.32	0.09
Lubuska Land	846	148	38	262	0.33	0.05
Łódź	353	1528	436	2818	0.53	0.26
Małopolska	3255	476	230	1049	0.18	0.15
Mazovia	28	5112	1209	8097	1.19	0.38
Opole	151	33	16	49	0.07	0.01
Podkarpacie	169	259	69	391	0.08	0.05
Podlasie	120	256	60	420	0.18	0.04
Pomerania	147	161	75	649	0.25	0.08
Silesia	1164	156	104	380	0.17	0.08
Świętokrzyska Land	112	1343	625	3008	1.05	0.53
Warmia-Mazuria	606	224	163	711	0.23	0.07
Wielkopolska	296	718	352	2823	0.44	0.16
West Pomerania	229	442	177	1164	0.62	0.12
Poland	**8864**	**13646**	**4259**	**26661**	**0.75**	**0.12**

Source: own compilation based on the Central Inspectorate of Plant Health and Seed Production data.



Figures: Figure 1. Integrated agriculture in Poland in the years 2004-2006
Source: own compilation.

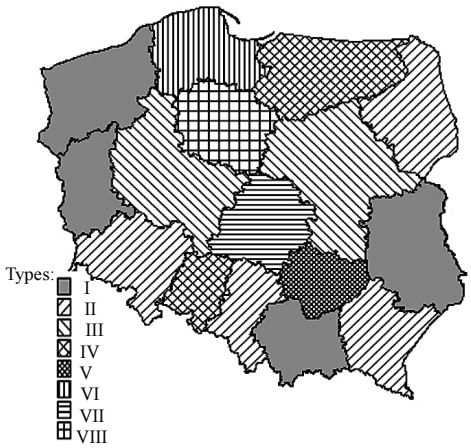


Figure 2. Types of environmentally-friendly farming systems in Poland in the years 2004-2006
Source: own compilation.

V – leading organic production supplemented by integrated and sustainable production (O4I1S1) in Świętokrzyska Land,
VI – similar proportions of organic and sustainable production (O3S3) in Pomerania,
VII – similar proportions of organic and integrated production (O3I3) in Łódź voivodeship,
VIII – leading sustainable production supplemented by integrated and organic production (S4I1O1) in Kujavia-Pomerania.

By the above criteria, the type of environmentally friendly farming system predominating throughout Poland was leading organic production supplemented by sustainable production. All the types distinguished are scattered territorially (Fig. 2). What hindered farmers from switching to integrated production was primarily the costs involved in the purchase of safer but much more

expensive pesticides and fertilisers. Also, integrated production is more difficult and troublesome for orcharders than other fruit-farming methods. It limits the choice of chemical products and the number of sprays, and can reduce yields without making up for it by higher prices, but a certificate helps to sell fruits faster. In the years 2004-2006 farmers engaged in integrated production were not eligible for EU payments, unlike those given to organic and sustainable production.

Conclusion

Integrated production is a niche type of production among the other forms of farming. In Poland it is largely pursued by specialised fruit- and vegetable-growing farms. In the future this group may come to include large farming estates growing field crops because research institutes have already prepared instructions for integrated production for those crops (to date, for the potato and rape), and new ones keep being worked out. Activities conducted in a plant's production cycle have to be registered in a special production book, which does not encourage implementation. Integrated agriculture has finally been embraced by financial support under the measure "Participation of farmers in food quality schemes" of the Rural Development Programme for the years 2007-2013. Within 90 days after completing their first year of integrated production, it is possible for farmers to submit applications. The payment covers net production costs and is calculated per farm rather than per area of the crop under integrated cultivation. Farmers unaffiliated with producer groups can only receive a maximum of 750 zlotys because most of the payment goes to member fees in producer groups practising integrated production. The absence of new rules changing eligibility conditions dooms integrated agriculture to remaining a niche farming system rather than expanding; it will simply be less profitable than conventional production.

In the conditions of a free market, the consumer demand for cheap food will be decisive for trends in the development of modern Polish agriculture. On the one hand, economic determinants will limit development possibilities of organic farming, while on the other, conventional farming will meet insurmountable ecological barriers. In this situation there will appear prospects for developing integrated agriculture in Poland as a system that can ensure satisfactory economic efficiency while minimising the scale of threats to the environment and human health.

Bibliography

Baum R., Wielicki W. 2005: Przewidywane scenariusze rozwoju wielkoobszarowych gospodarstw rolnych (Anticipated scenarios of development of large farming estates). [In:] Rolnictwo a rozwój obszarów wiejskich, Kłodziński M., Dżun W. (eds.). IRWiR PAN, Warszawa, 162-174.

Biegajło W. 1973: Typologia rolnictwa na przykładzie województwa białostockiego (Typology of farming on the example of Białystok voivodeship). *Prace Geograficzne*, 101, Warszawa, 71-77.

Kodeks Dobrej Praktyki Rolniczej (Good Farming Practice Code). 2004: MRiRW-MŚ, Warszawa.

Kośmicki E. 1993: Tendencje rozwojowe rolnictwa na świecie i w Polsce (Development tendencies in agriculture in the world and in Poland). [In:] Rolnictwo ekologiczne od teorii do praktyki, Sołtysiak U. (ed.). Stowarzyszenie Ekoland, Warszawa, 39-54.

König W., Sunkel R., Necker U., Wolf-Straub R. 1989: Alternativer und konventionelier Landbau. Stuttgart.

Kuś J. 1995: Systemy gospodarowania w rolnictwie. Rolnictwo integrowane (Farming systems. Integrated agriculture). Materiały szkoleniowe 42, IUNG, Puławy.

Kuś J., Fotyma M. 1992: Stan i perspektywy rolnictwa ekologicznego (Status and prospects of organic farming). *Fragmenta Agronomia*, 2, 75-86.

Runowski H. 1996 : Ograniczenia i szanse rolnictwa ekologicznego (Limitations and chances of organic farming). SGGW, Warszawa.

Sołtysiak U. (ed.). 1994: Rolnictwo ekologiczne w praktyce (Organic farming in practice). Stowarzyszenie Ekoland, Stiftung Leber & Umwelt, Warszawa.

Ustawa *o ochronie roślin* z dnia 18 grudnia 2003 r. (Plant Protection Act of 18 December 2003) (Dz. U. 2004 r. Nr 11 poz. 94 z późn. zm.).

Zimny L. 2007: Definicje i podziały systemów rolniczych (Definitions and divisions of farming systems). *Acta Agrophysica*, 10, 507-518.

Streszczenie

Artykuł dotyczy teoretycznych aspektów rolnictwa integrowanego (pojęcie, cele) oraz przedstawienia wyników badań związanych ze zróżnicowaniem przestrzennym stosowania przez rolników produkcji integrowanej w Polsce w latach 2004-2006.

Corresponding address:

dr Anna Kołodziejczak
Adam Mickiewicz University in Poznan, Institute of Socio-Economic Geography and Spatial Management,
Department of Food Management and Rural Areas
ul. Dzięgielowa 27, 61-680 Poznań, Poland
tel. (061) 829 61 61, e-mail: aniaka@amu.edu.pl