

ORCHARDING IN POLAND AND UKRAINE IN THE YEARS 2009–2013

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Риш М. Садівництво в Польщі та Україні у 2009–2013 роках

Описано процес виробництва, регіони вирощування, обсяги експорту та імпорту окремих різновидів фруктів у Польщі та Україні. Показано результати аналізу вторинних джерел баз даних FAO за 2009–2013 рр. з використанням матеріалів органів статистичних служб України і Польщі. З'ясовано, що в проаналізованому періоді рівень фруктового виробництва в Польщі та Україні піднявся, особливо в секторі яблук і полуниць. Обсяг зібраного урожаю твердих фруктів є вищий в Україні, за винятком яблук, проте протилежна тенденція може спостерігатися щодо ягід: більший урожай є в Польщі, ніж в Україні. Україна має більші можливості культивування твердих фруктів, ніж Польща, результатом чого є вищий рівень продуктивності з розрахунку на одиницю використовуваної площі, проте польський імпорт та експорт вищі. Україна імпортує більше яблук, ніж Польща, і водночас експортує більше кавунів, оскільки її кліматичні умови сприятливіші для їх вирощування.

Ключові слова: садівництво, фрукти, експорт, імпорт, Польща, Україна.

Rysh M. Orcharding in Poland and Ukraine in the years 2009–2013

The aim of the study was to present the process of production, area of planting, the volume export and import of selected species of fruit in Poland and Ukraine. The paper analyzes secondary sources coming from FAO (Food and Agriculture Organization) databases from the years between 2009 and 2013 along with the figures from the Central Statistical Offices of Ukraine and Poland. Studies have shown that in the analyzed period, the level of fruit production in Poland and Ukraine has risen, especially in apples and strawberries sectors. The harvest level of pome fruits and stone fruits is higher in Ukraine, with the exception of apples, however the opposite tendency can be observed in case of berries-bigger harvest in Poland than in Ukraine. Ukraine has an access to a greater area of cultivation of stone fruit than Poland, which turns into a greater productivity per unit area. However, Polish import and export are higher. Ukraine imports more apples than Poland and same time exports more watermelons, as a result of climatic and soil conditions required for growing this kind of species of fruits.

Key words: orcharding, fruit, export, import, Poland, Ukraine.

Риш М. Садоводчество в Польше и Украине в 2009–2013 годах

Показаны процесс производства, регионы выращивания, объемы экспорта и импорта отдельных разновидностей фруктов в Польше и Украине. Приведены результаты анализа вторичных источников баз данных FAO за 2009–2013 гг. с использованием материалов органов статистических служб Украины и Польши. Установлено, что на протяжении анализируемого периода уровень фруктового производства в Польше и Украине поднялся, особенно в секторе яблок и клубники. Объем собранного урожая твердых фруктов более высок в Украине, за исключением яблок, однако противоположная тенденция может наблюдаться с ягодами: высший урожай в Польше, чем в Украине. Украина имеет больше возможностей для культивирования твердых фруктов, чем Польша, результатом чего будет высший уровень производительности в расчете на единицу используемой площади, однако польский импорт и экспорт более высоки. Украина импортирует больше яблок, чем Польша, и в то же время экспортирует больше арбузов, так как ее климатические условия более благоприятны для их выращивания.

Ключевые слова: садоводство, фрукты, экспорт, импорт, Польша, Украина.

Introduction. Poland is in the forefront in terms of production and export of certain fruits for processing, e.g. apples, strawberries, cherries and black currants. It is also one of the largest producers of fruits among all European Union Member States. The development of pro-

duction and export of labour-intensive types of fruit for processing is possible thanks to the favourable climatic and economic conditions, and above all, abundant labour resources in the country, concentrated mainly in family farms. In turn, a direct human consumption is the oppor-

tunity for the development of production of berries.

After integration of Poland with the European Union, the abolition of customs, duties and other administrative restrictions there were great opportunities for the development of production and export on the European market. Efficient organization of the market, proper preparation of the offers in terms of quantity and quality and continuity of supply are beneficial to the development of the fruit market [1, p. 2].

Poland and Ukraine differ not only by the area of the country. The fruit markets in both countries are relatively different. They have however a common factor that combines them – the main fruits traded in both countries are apples.

Common tendency of apple markets in both countries is the level of their development – higher than in other types of fruit. What is more the same is with the dependence of the internal market on imports and expansion of their orchard production. There is a significant potential for the production of fruits in Ukraine. Although the country has an excellent natural and climatic conditions ideal for fruit production, the lack of capital and knowledge of the orchard are the cause of very slow progress in fruit. The labour force in Ukraine is very cheap, i.e. there is a low

wage per hour while staying on the field, and yet it does not convert into low product prices. Production costs are elevated, because the prices of means of production are high, quality of final products is low and also the workforce is not efficient enough [2].

Methods and materials. The study included the state of fruit growing in Poland and Ukraine between years 2009 and 2013. The primary source of data for analysis was statistical data published by the Food and Agriculture Organization (FAO), the Central Statistical Office (GUS) and the Statistical Office of Ukraine. The analysis takes into account the volume of production, exports and imports, area where the fruits are grown, the yield per unit area of such species as apple, pear, plum, cherry, strawberry, raspberry and currant.

Orcharding in Poland and Ukraine in comparison with the world and Europe. Poland is a well-known producer of fruits in the temperate climate zone, both on the European and global markets. As indicated by the data FAOSTAT released by Freshfel, the world's fruit harvest in 2013 was at level of 656,5 million tonnes [3]. In comparison to 2010, production increased for 48 million tons. World fruit harvests surveyed in 2009–2013 are presented in Table 1.

Table 1

**World and European collections of selected fruits in years from 2009 to 2013
(in thousands of tonnes)***

	Species	2009	2010	2011	2012	2013	Share of Poland in % (2013)	Share of Ukraine in % (2013)
World	Apples	71007,6	70585,8	76053,7	77488,5	80822,5	3,8	1,5
	Pears	22430,4	22632,6	24035,7	24311,1	25203,8	0,3	0,7
	Plums	10898,4	10667,4	10996,9	10708,2	11528,3	1,6	0,9
	Cherries	2193,7	2072,4	2135,2	2258,0	2294,5	2,1	3,5
	Strawberries	6614,8	6593,4	6758,6	7294,5	7739,6	2,5	0,9
	Raspberries	503,1	524,8	605,4	573,7	578,2	20,9	5,1
	Currants	689,6	654,5	663,8	662,2	706,9	0,3	0,04
Europe	Apples	15774,9	14137,9	15204,0	14939,0	15958,5	19,3	7,6
	Pears	3274,6	2880,6	3338,6	2458,2	3006,9	2,5	5,6
	Plums	2920,9	2738,4	2748,4	2277,1	2935,2	3,5	6,3
	Cherries	790,9	752,2	854,1	733,9	841,3	5,7	9,7
	Strawberries	1526,2	1455,9	1372,6	1362,3	1485,0	13,0	4,8
	Raspberries	407,5	397,1	447,4	429,6	432,8	28,0	6,8
	Currants	656,0	627,6	630,3	629,0	673,2	29,5	4,0

**Source: own calculations based on data taken from FAOSTAT.*

For many years, Poland has been among the top world's producers of apples (4% of the global harvest, 4th rank in 2013). While Polish harvest of pears, cherries and plums is not that significant. In the structure of production of berries in Poland, the biggest role play currants, raspberries (second rank in the world) and strawberries, which are on the eight's place. In the analyzed period, their share was increasing.

Fruit production is an important trend of agricultural production in Poland. Appropriate land resources, a large group of manufacturers and increasing export opportunities cause the increase in fruit production. The share of fruit in the value of commodity crop production in 2013 was over 15%. In years 2009 and 2013, the average fruit harvest in Poland stood at 3,56 million tonnes, representing 6,7% of the total fruit collections in the European Union [4].

In the Ukraine, the main direction of agricultural industry is crop production. Its share in the total agricultural production in 2013 accounted for 69,4%, and fruit production from year to year shows small fluctuations and stands at level 3,5% [5].

Globally, Ukraine can be placed among the countries with medium level of development of

orcharding. In 2013, this country produced 2,76 million tons of fruit in total, which accounted for 0,4% of world production. There was an increase in agricultural production in years 2009–2013. The highest increase, almost by 30,4% was recorded in 2011 in comparison with the previous year [4]. Fruit trees and berries are one of the most important components of agricultural production in Ukraine.

Harvest of fruits from trees and berries did not constitute a significant share of global production. The only exception were the raspberries and cherries (respectively eighth and sixth place in the world production). Despite the insignificant share (0.04%) in the global production of currants Ukraine was third, after the Russian Federation and Poland in 2013.

The area of orchards. Poland is a country with a much smaller surface than Ukraine, and yet the acreage of most species of fruits planted in Poland is larger. In 2009–2013, the Polish acreage of apple crop was much higher than in Ukraine. On the other hand, the area of planting of pears and cherries in Ukraine was higher than in Poland, and only the area of planting of plum trees was at a similar level in both countries (Table 2).

Table 2

Size of planting areas of selected fruits in Ukraine and Poland in the years 2009–2013 (in thousands per Hectare)*

Country	Species	2009	2010	2011	2012	2013	Average
Poland	Apples	173,6	170,4	183,5	194,7	193,4	183,1
	Pears	13,2	8,4	11,7	10,9	10,7	11,0
	Plums	21,0	17,9	20,2	19,3	18,2	19,3
	Cherries	10,6	12,0	11,6	11,6	10,9	11,3
	Strawberries	53,6	37,1	50,5	46,8	55,0	48,6
	Raspberries	20,2	29,6	27,1	28,4	28,8	26,8
	Currants	43,1	45,2	39,9	44,7	45,9	43,8
Ukraine	Apples	110,0	105,2	105,2	105,5	103,9	106,0
	Pears	13,6	13,6	13,6	13,4	13,3	13,5
	Plums	19,9	19,6	19,3	19,2	19,2	19,4
	Cherries	12,6	12,6	12,5	12,5	12,4	12,5
	Strawberries	8,2	8,1	8,2	8,4	8,6	8,3
	Raspberries	6,3	5,1	5,1	5,0	5,1	5,3
	Currants	4,4	4,4	4,4	4,4	4,5	4,4

*Source: own calculations based on data taken from FAOSTAT.

Analyzing the period from 2009 to 2013, it is clear that there was an increase in Polish raspberry growing acreage by about 42%. Also there was an increase (by about 7%) in growing acreage of currants. The area of cultivation of straw-

berries remained at a similar level, with periodic fluctuations. These fluctuations result from the reaction of producers to market prices of fruit.

Ukraine in terms of area is one of the largest countries in Europe. Ukrainian orcharding char-

acterises with large areas of farms, as it is dominated by state-owned large-area farms – so-called collective farms. This is the result of specific political and economic conditions as well as because large area of the state [6, p. 3]. Since 2001, each year we have been observing an increase in number of orchards in Ukraine 3,2–3,9 thousand hectares per year. About half of this surface are usually orchards with pome fruits (apples, pears). The vast majority of new plantings are the orchards established with the use of modern technology and promising varieties [7]. In Ukraine there is observed a slow decline in

cultivation areas of most species of fruits. The only was found in areas of planting currants (2,3%) and strawberries (by 4,9%).

Fruit production. Soil and climatic conditions dominating in most regions of Ukraine are beneficial to the cultivation of traditional species of fruit. Fruit trees and berries are one of the most important components of agricultural production in the country. During the years from 2009 to 2013 in Ukraine there has been noted a steady increase in production of apples and other types of fruit (pears by 16%, cherries by 53% and strawberries by 22%) (Table 3).

Table 3

**Production of selected fruits in Ukraine and Poland in years 2009–2013
(in thousands of tonnes)***

Country	Species	2009	2010	2011	2012	2013	Average
Poland	Apples	2626,3	1877,9	2493,1	2877,3	3085,1	2591,9
	Pears	83,0	46,5	62,8	64,7	75,7	66,5
	Plums	120,7	83,8	91,8	102,5	102,4	100,2
	Cherries	50,5	40,1	38,0	41,1	47,6	43,4
	Strawberries	198,9	153,4	166,2	150,2	192,6	172,3
	Raspberries	81,8	92,9	118,0	127,1	121,0	108,1
	Currants	196,5	196,7	169,6	194,5	198,5	191,1
Ukraine	Apples	853,4	897,0	954,1	1126,8	1211,4	1008,5
	Pears	145,9	141,7	153,1	157,5	169,4	153,5
	Plums	136,7	154,5	134,7	147,2	186,3	151,9
	Cherries	53,0	73,0	72,8	72,6	81,2	70,5
	Strawberries	57,9	57,2	56,0	60,0	70,7	60,4
	Raspberries	27,7	25,7	28,1	30,3	29,5	28,3
	Currants	23,2	25,8	25,7	24,1	26,6	25,1

**Source: own calculations based on data taken from FAOSTAT.*

The level of collections of various types of fruit significantly differs between Poland and Ukraine. In both countries, harvest of pome fruits is dominated by apples. A volume of apples collected during the analyzed period was more than 2,5 times higher in Poland than in Ukraine, while the average yields of other stone fruits (plums, cherries) in Ukraine were higher than in Poland. Although the surface of the apple orchards decreased, apple production in Ukraine has increased in the analyzed period. This is thanks to removal of the old trees and establishment of new intensive apple orchards. On the other hand, Ukraine has collected more than twice times of pears. On the contrary, the harvest of berries was higher in Poland. In Poland dominated currants and strawberries, and in

Ukraine strawberries and raspberries among the berries. Harvests of strawberries were three times lower in Ukraine than in Poland, despite the fact that in Ukraine in 2013 there was noted an increase in production by 22% compared to 2009.

In comparison to Poland more dominant crops in Ukraine are the fruit trees. Smaller apple harvest in Ukraine results due to the low productivity of the orchards (tonnes/hectare). In years 2009-2013, there was an average of about 9,5 tonnes of apples harvested, while at the same time in Poland, the average yields per hectare exceeded 14 tonnes (Table 4). Improved yield of other fruit trees in Ukraine results from the fact that the collections of these fruits are higher than in Poland.

Table 4

**Yield per unit area of selected fruits in Ukraine and Poland
in the years 2009–2013 (in tonnes per hectare)***

Country	Species	2009	2010	2011	2012	2013	Average
Poland	Apples	15,1	11,0	13,6	14,8	15,9	14,1
	Pears	6,3	5,6	5,4	5,9	7,1	6,1
	Plums	5,7	4,7	4,5	5,3	5,6	5,2
	Cherries	4,8	3,3	3,3	3,5	4,4	3,9
	Strawberries	3,7	4,1	3,3	3,2	3,5	3,6
	Raspberries	4,0	3,1	4,4	4,5	4,2	4,0
	Currants	4,6	4,3	4,3	4,4	4,3	4,4
Ukraine	Apples	7,8	8,5	9,1	10,7	11,7	9,5
	Pears	10,7	10,4	11,3	11,8	12,7	11,4
	Plums	6,9	7,9	7,0	7,7	9,7	7,8
	Cherries	4,2	5,8	5,8	5,8	6,5	5,6
	Strawberries	7,1	7,1	6,8	7,1	8,2	7,3
	Raspberries	4,4	5,0	5,5	6,1	5,8	5,4
	Currants	5,3	5,9	5,8	5,5	5,9	5,7

*Source: own calculations based on data taken from FAOSTAT.

Export and import of fruits. Poland exports much more fruits than Ukraine (Table 5). The Polish and Ukrainian export is dominated by apples. Polish export of apples is more than twenty times higher than Ukrainian. The major directions of Polish export of apples in 2013 were Russia, Belarus, Germany, Kazakhstan and Ukraine. Ukraine exports an average of forty thousands of tonnes of apples a year. Almost 99,5% of the total volume of apples were exported to the countries of the CIS (Russia, Belarus, and Kazakhstan). A small amount was exported to Asia, Sri Lanka and Turkey [8].

In Ukraine there was a very large decline in exports of several fruits in years from 2009 to 2013; 81,6% in apples, 70% in pears, and 85% in plums. These changes occurred due to the fact that the country intended to ratify the association agreement with the European Union and as a result launched a trade war with Russia. The restrictions on the export of Ukrainian fruit and vegetable production were introduced, while one of the main markets in fruit trade was the Russian Federation [9]. Ukrainian producers could not enter the western market, because the production did not match the standards set in Europe. Price for production was low, so the export was not profitable and the European producers themselves were able to meet the needs of the internal market [9].

In addition to apples Poland exports significantly more other fruits than Ukraine. The main directions of Polish exports of fresh and frozen fruits are the European Union countries (Germany, Belgium, France, Netherlands, United Kingdom, and Sweden) and countries of the Commonwealth of Independent States (Russia, Belarus, Ukraine and Kazakhstan). The exception is export of watermelons, where Ukraine sells abroad more than thirteen times more than Poland. In the analyzed period of five years exports of cherries, strawberries and apricots has significantly increased in Ukraine (in that order cherries by more than 200%, strawberries more than 1,307%, apricots by 466%). Fruit export in 2009–2013 is presented in Table 5.

Ukraine's potential as an exporter of fruit may be limited by weak infrastructure, logistics, lack of proper refrigeration and sometimes insufficient knowledge of fruit producers. Despite the high growth of exports of certain species of fruit Ukraine remains an importer of fruit. This is mainly because they have archaic warehouses, where product quality quickly deteriorates and increasing year-round supermarket chains' demand for fresh fruit [10]. Details regarding the import of fruit in the years 2009–2013 in Poland and Ukraine are shown in Table 6. More than half of the fruit in Ukraine is imported, mainly from Poland, Spain, Italy and Greece.

Table 5

Export of fruit in Poland and Ukraine in the years 2009–2013 (tonnes)*

Country	Species	2009	2010	2011	2012	2013	Average in thousands of tonnes
Poland	Apples	777071	728500	532058	958364	1205248	840,2
	Pears	19789	11923	25146	39035	42104	27,6
	Plums	17949	7222	9420	7873	8193	10,1
	Cherries	10995	2489	5049	7339	10207	7,2
	Strawberries	16188	15078	13937	11578	14174	14,2
	Currants	3414	4375	5239	7359	5748	5,2
	Apricots	2188	970	1418	3306	2310	2,0
	Peaches and nectarines	20989	23432	23771	35642	20865	24,9
	Watermelons	3864	2278	1425	970	974	1,9
Ukraine	Apples	59209	74959	36072	18954	10899	40,0
	Pears	719	761	479	339	222	0,5
	Plums	382	1121	457	100	57	0,4
	Cherries	1417	3308	3222	3610	4065	3,1
	Strawberries	14	17	129	184	183	0,1
	Currants	19	1	0	0	0	0,0
	Apricots	104	434	1812	14	485	0,6
	Peaches and nectarines	0	17	4	1	44	0,0
	Watermelons	25424	43561	22582	14313	19547	25,1

*Source: own calculations based on data taken from FAOSTAT.

The average apple production in Ukraine in 2009–2013 reached 1 million tonnes. This volume of production makes it necessary to import apples. Ukrainian experts predict that the import of apples will last many more years, although it is more than 3 times higher than in Poland (Table 6) the main importers of apples to Ukraine are Chile, the Netherlands, Greece, Chi-na, Italy and France. The pears are mainly imported from the Netherlands (from that country also come strawberries), Argentina and Italy [11].

In 2013 Poland imported a total of just over 40 thousands of tonnes of apples, which is about 18% less when compared to 2012, when the Polish market absorbed 51,5 thousands of tonnes of fruit. In general, import has been declining annually since 2010, which is directly proportional to an increase in domestic production of fruit (in 2011 the import of apples to the Polish market reached 61,9 thousands of tonnes). The main supplier of these fruits in the analyzed period was Lithuania. Up to 2012 the biggest importer of apples to Poland was Italy.

Summary and conclusions. The situation of Polish orchard man is relatively good. Poland can boast with a high productivity and quality of fruits and a high level of mechanization and technology in farms, which translates into many advantages of offered fruits. In the years 2009–2013, the fruit production indicated a growing trend. The main direction of fruit production in Poland is the production of apples. Cherries, plums and berries are also important in national production of fruits. Similar trends were observed in fruit crops in Ukraine. Where there has been noted a steady increase in the production of all types of fruit. Only in case of raspberries a slight decline in production was noted.

There are no significant variations in the surface of the planting of fruit plants in Polish and Ukrainian orchards during the analyzed period. The acreage of cultivation of fruit trees and berries has remained fairly constant with slight fluctuations in particular years. Although Poland is smaller than Ukraine, the acreage of certain species of fruit plants is greater there. This includes apples, currants and strawberries.

Table 6

Import of fruits in Ukraine and Poland in the years 2009–2013 (tonnes)

Country	Species	2009	2010	2011	2012	2013	Average in thousands of tonnes
Poland	Apples	22197	39630	61898	51450	41998	43,4
	Pears	14721	24136	35656	28306	24138	25,4
	Plums	4309	8022	8898	11627	6972	8,0
	Cherries	568	1695	961	1127	871	1,0
	Strawberries	4294	5564	6712	12834	14962	8,9
	Currants	752	30	64	8	251	0,2
	Apricots	4333	3863	4122	8816	3989	5,0
	Peaches and nectarines	88383	92507	99512	108240	92588	96,2
	Watermelons	100102	98288	96975	99642	109269	100,9
Ukraine	Apples	251394	198065	102479	93510	55176	140,1
	Pears	3192	3145	7007	7270	5139	5,2
	Plums	1594	1605	2458	4581	2018	2,5
	Cherries	816	288	1099	1002	414	0,7
	Strawberries	1631	678	679	1287	1040	1,1
	Currants	4	17	0	0	0	0,0
	Apricots	4158	2725	2547	10308	3792	4,7
	Peaches and nectarines	33101	38237	40361	68525	36186	43,3
	Watermelons	316	292	203	154	154	0,2

*Source: own calculations based on data taken from FAOSTAT.

Large production capacity in the range of temperate climate fruits, which exceeds domestic needs, makes it necessary to look for customers abroad. After the Polish accession to the EU, the abolition of customs barriers gave the possibility of selling fruits to new consumers. In subsequent years this fact allowed for the dynamic growth of exports (apples, pears, currants). Polish fruits are well known in the world as natural, healthy and high quality products.

Despite the increase of fruit production in Ukraine deficiencies in demand on the domestic market are supplemented with fruit coming from abroad. Most of the analyzed fruits imported to Ukraine are apples (more than three times more than Poland) and plums (almost 5,5 times more), despite the higher collection of these fruits. Ukrainian climatic and soil conditions, are favourable for the cultivation of cucurbits fruit (watermelon), a large part of their cucurbit production is exported. Especially there is an increase in export to the EU countries, which gives a good perspective for this part of Ukrainian crops.

Fruit production in Ukraine is supported by low costs and wages, favourable climatic condi-

tions and fertile soil. Slow progress in fruit production in Ukraine is mainly due to the planting of poor quality nursery material without warranty, and free of viruses, different levels of knowledge about crop production, the mentality of the producers and the lack of modern production technologies and the implications of its introduction.

There was noted a decrease in orchard production during the years 2015–2016 in Poland and Ukraine, and with it a decrease in the volume of exports and imports. This is being influenced by both internal and external factors in both of the countries. To the most important external factors we may include the imposition of embargo on imports of grocery and agricultural products by the Russian Federation on 01.08.2014.

Significantly important was the war in the east of the country and the loss of part of the territory (The Crimean Peninsula) to the Russian Federation [12]. It was one of the largest fruit-growing areas in Ukraine. Ukraine has great production potential and one of its most promising sectors is the fruits production.

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