ANNALS OF THE POLISH ASSOCIATION
OF AGRICULTURAL AND AGRIBUSINESS ECONOMISTS

ROCZNIKI NAUKOWE
STOWARZYSZENIA EKONOMISTÓW ROLNICTWA I AGROBIZNESU

Received: 23.12.2024
Acceptance: 28.02.2025
Published: 11.03.2025

JEL codes: Q11, Q18

Annals PAAAE • 2025 • Vol. XXVII • No. (1)

DOI: 10.5604/01.3001.0055.0206

SYLWIA KIERCZYŃSKA[1]

Poznań University of Life Sciences, Poland

THE EFFECTS OF EMERGENCY SITUATIONS ON FRUIT PRODUCTION AND PURCHASE PRICES IN POLAND

Key words: emergency situations, crisis, producer prices, fruit for processing, COVID-19, war in Ukraine

ABSTRACT. In recent years, in Poland there have been emergency situations causing difficulties and threats to fruit producers. In 2007 and 2017 there were severe frosts during the flowering period of fruit trees and shrubs. In 2014 the Russian Federation introduced an embargo on the import of agricultural products from the EU member-states. In 2020 there was the COVID-19 pandemic. In February 2022 Russia started war against Ukraine. The aim of this study was to assess changes in the level of fruit yields and purchase prices in the years when the aforementioned emergency situations occurred, to determine whether they led to fruit production crises in Poland, and to assess the ways the crises were overcome. In order to assess the strength of the crisis, deviations of the yield and purchase prices of selected fruits (apples, sour cherries, raspberries, and blackcurrants) from the average of the four years preceding the occurrence of the emergency situation were calculated. The study showed that the emergency situations caused by spring frosts were accompanied by fruit yield losses. However, this did not lead to a fruit production crisis, because lower yields were compensated by higher fruit purchase prices. In 2014 the Russian embargo on apples increased the supply of these fruits, which led to a decrease in their purchase prices. In order to counteract the crisis, fruits were withdrawn from the market. The COVID-19 pandemic drew consumers' attention to healthy nutrition. Consumers became more interested in eating fruit and the prices of superfruits (raspberries, blackcurrants) increased. Military operations caused disruptions in international trade and changes in fruit purchase prices in Poland. The emergency situation caused by the war in Ukraine was accompanied by higher import of fruit products from that country and a decrease in the purchase prices of fruit (mainly raspberries) in Poland.

[1] Corresponding author: sylwia.kierczynska@up.poznan.pl

INTRODUCTION

The word crisis derives from the Greek *krisis*, which means a breach, discontinuity (Björck, 2016). According to the Harvard Business School definition, cited by Luecke and Barton (2004), a crisis, describes a change, both an abrupt one and one developing gradually, leading to urgent problems which must be solved immediately. According to Nteka (2021), who cited Okumus and Karamustafa (2005), a crisis is a large-scale and sudden event which usually has negative effects.

According to Bertolozzi-Caredio et al. (2023, cited in: European Commission, 2005, 2020), an event can be recognised as one contributing to a food system crisis if it is unforeseen, exceeds one's individual capabilities to cope with it and affects a large number of economic entities.

Bundy, Pfarrer, and Coombs (2017) distinguished four main characteristics of a crisis:

1) a crisis is a source of uncertainty, confusion, and change,
2) a crisis is harmful or dangerous to the organisation and its stakeholders, who might have conflicting interests and needs,
3) a crisis is a behavioural phenomenon, which means that according to publications, a crisis is a phenomenon created by involved participants rather than a function of depersonalised factors of the objective environment,
4) a crisis is part of a larger process rather than a separate event.

According to Rydzak (2011), due to the variability in the perception of various negative events many authors use the words emergency situation and crisis interchangeably. According to Rydzak (2011), an emergency situation is understood as the entire period during which external and internal factors trigger a rapid process of transformation of disruptions in the functioning of an organisation into serious disturbances, which begin to threaten its existence. On the other hand, a crisis is a moment in an emergency situation when disturbances of a material or non-material nature become extreme, but the organisation is still able to eliminate them on its own. The aggravation of negative phenomena and inappropriate reaction to them may lead to a catastrophe and possible liquidation of the organisation. If effective anti-crisis measures are taken, the organisation undergoes rehabilitation. Depending on the scale of changes introduced in this period, the enterprise either stagnates or begins a new stage of development in its life cycle (Rydzak, 2011). Otwinowski (2010), who is of a similar opinion, claims that a crisis is the climax of an emergency situation. According to the researcher, an emergency situation begins when its symptoms occur and it includes the pre-crisis phase, crisis, and post-crisis phase. According to Björck (2016), from a time perspective, there are three main phases of a crisis: the pre-crisis phase, crisis, and post-crisis phase.

Kozłowski and Nosek (2008) defined an emergency situation as a period in which an organisation, community or country encounters difficulties and dangers which seriously influence its stability, functioning, and development. According to the researchers, an emergency situation is characterised by exceptional conditions which require immediate action and decisions in order to protect interests and minimise damage (Kozłowski, Nosek, 2008). Emergency situations may be caused by: the forces of nature (fires, floods, hurricanes, droughts, hailstorms, torrential rains, severe frosts, snowstorms, as well as infectious diseases of humans, animals, and plants), human activity with socioeconomic and environmental effects (biological, chemical, and radioactive contamination; disasters, breakdowns; environmental pollution – acid rain, smoke; contamination of soil, water, and food with toxic pollutants from the industry), and other factors, i.e. situations resulting from conflicts, social tensions or political actions (terrorism, blockades of transport routes, social unrests, and warfare) (Kozłowski, Nosek, 2008).

According to Bielza, Stroblmair, Gallego, Conte and Dittmann (2007), the economic stability of rural areas may be threatened by a crisis caused by various disasters, climate-related occurrences as well as those affecting plants and animals. Weather-related risks are a major source of uncertainty for agricultural and horticultural farms. Droughts and heavy rains are responsible for poor yields worldwide. Fruit and vegetable production is one of the sectors that are particularly susceptible to extreme weather events, especially late spring frosts, extreme heat and droughts (Bertolozzi-Caredio et al., 2023).

Poland is a major global and one of the largest fruit producers in the European Union (EU). Disruptions in fruit production in Poland affect the availability and prices of fruit for food processing plants and consumers. In recent years, in Poland there have been emergency situations causing difficulties and threats to fruit producers. In 2007 and 2017 there were severe frosts during the flowering period of fruit trees and shrubs. In 2014 the Russian Federation introduced an embargo on the import of agricultural products from the EU member-states. In 2020 there was the global COVID-19 pandemic. In February 2022 Russia started war against Ukraine.

Therefore, it is justifiable to ask the question what changes in the yields and purchase prices of fruits these emergency situations caused and how they influenced fruit producers in Poland. The aim of this study was to assess changes in the level of fruit yields and purchase prices in the years when the aforementioned emergency situations occurred, to determine whether they led to fruit production crises in Poland, and to assess the ways the crises were overcome.

RESEARCH MATERIAL AND METHODOLOGY

Data on fruit yields in Poland came from the Central Statistical Office (GUS), whereas data on average annual fruit purchase prices came from the *Fruit and Vegetable Market* (pl. *Rynek Owoców i Warzyw*) semi-annual, published by the Institute of Agricultural and Food Economics – National Research Institute, Poland (IERiGŻ-PIB, 2005-2024). The average yields and purchase prices of selected fruits (apples, sour cherries for freezing, raspberries, and blackcurrants) for processing were analysed. The analysis encompassed the data for the period ranging from 2003 to 2023. A detailed analysis was conducted for the years in which emergency situations were identified, i.e. 2007, 2014, 2017, 2020, 2022, and 2023. For each type of fruit, deviations of the yield and purchase prices in a year with an emergency situation from the average yield and purchase prices in the four-year period preceding the emergency situation were calculated. The percentage share of the deviation in the average was also calculated. In this way, the changes in the yields and purchase prices during the period of emergency situations were calculated. The higher the share of deviation (the difference between actual data and the four-year average) in relation to the four-year average was, the greater the strength of the emergency situation was.

RESULTS

EMERGENCY SITUATIONS CAUSED BY FORCES OF NATURE VS FRUIT YIELDS AND PURCHASE PRICES IN POLAND

The average yield is the quotient of the volume of harvest and the plantation area of a particular type of fruit. The yields of fruit trees and shrubs in Poland depend on various factors, with natural factors being of key importance. Natural factors include weather conditions during the growing season and during the winter dormancy of fruit trees and shrubs. The air temperature, the presence of snow in winter, the time and length of spring frosts, especially during the flowering and fruit setting on trees and shrubs, the amount and distribution of precipitation (including hail) and the temperature during the growing season are all important for fruit production. During the period under analysis, spring frosts in 2007 and 2017 were important for fruit production on a national scale, because they destroyed a significant number of fruit buds on trees and berry shrubs. According to Nosecka (2007), due to the mild winter and high temperatures in March and April 2007, fruit trees and shrubs started flowering about two weeks earlier in the spring. On 21 April the first frosts came and damaged orchards in the Grójec region. The next wave of frosts came in early May. It caused considerable damage in all fruit-growing regions of Poland (Nosecka, 2007). In 2007 the yield of fruit in Poland was 48% lower than in 2006. The yield of apples dropped by 55%, sour cherries – by 45%, pears – by 52%, plums

– by 43%, and sweet cherries – by 47%. The yield of berry plantations decreased by 18%. The yield of blackcurrants dropped by 30%, redcurrants – by 23%, strawberries – by 13%, raspberries – by 11%, gooseberries and chokeberries – by 12% (Nosecka, 2007).

The mild winter of 2016/2017 did not cause any major losses in orchards and berry plantations. However, in late April, temperatures dropped suddenly and the cold spell lasted until mid-May. During that period, temperatures dropped to -5°C several times, and locally even to -8°C, damaging flower buds in orchards (Nosecka, 2017a). As a result of the damage caused by frost in the spring of 2017, the yield of apples was about 30% smaller than in the previous year. The yield of pears dropped by 26%, plums – by 45%, sour cherries – by 64%, and sweet cherries – by 63%. In total, the yield of other tree fruits, i.e. peaches, apricots, walnuts and hazelnuts, fell by over 50%. Berry production decreased by 16%. The yield of strawberries dropped by 10% and raspberries – by 23% (Nosecka, 2017a).

In 2007 and 2017 the emergency situations caused by frosts during the flowering period and fruit setting on trees and shrubs reduced their yields and, consequently, resulted in lower availability of fruit for processing. In 2007 the average yield of apples in Poland was about 6 t/ha, which was 58% lower than the four-year average. In 2017 it was 13.8 t/ha, which was 23% lower than the four-year average (Table 1). The lower supply of fruit resulted in higher fruit purchase prices. In 2007 apples reached a record purchase price of almost 1 PLN per kg. In 2017 the purchase price of industrial apples was 0.75 PLN per kg, which was the highest in the decade (Figure 1). In 2007 the purchase price of apples was

Table 1. The strength of changes in fruit yield in Poland in the years of emergency situations

Emergency situations		Fruit species			
		apples	sour cherries	raspberries	black-currants
Frosts in 2007	Yield in 2007 (t/ha)	5.92	2.86	2.74	2.93
	Average yield in the 2003-2006 (t/ha)	14.02	4.90	3.51	4.42
	Yield deviation (t/ha)	-8.10	-2.04	-0.77	-1.49
	Yield in 2007 by average yield (%)	-58	-42	-22	-34
Frosts in 2017	Yield in 2017 (t/ha)	13.84	2.43	3.56	2.95
	Average yield in the 2013-2016 (t/ha)	17.96	5.95	3.99	3.63
	Yield deviation (t/ha)	-4.16	-3.52	-0.43	-0.68
	Yield in 2017 by average yield (%)	-23	-59	-11	-19

Source: own calculations based on IERiGŻ-PIB (2005-2024) and GUS (2004-2024) data

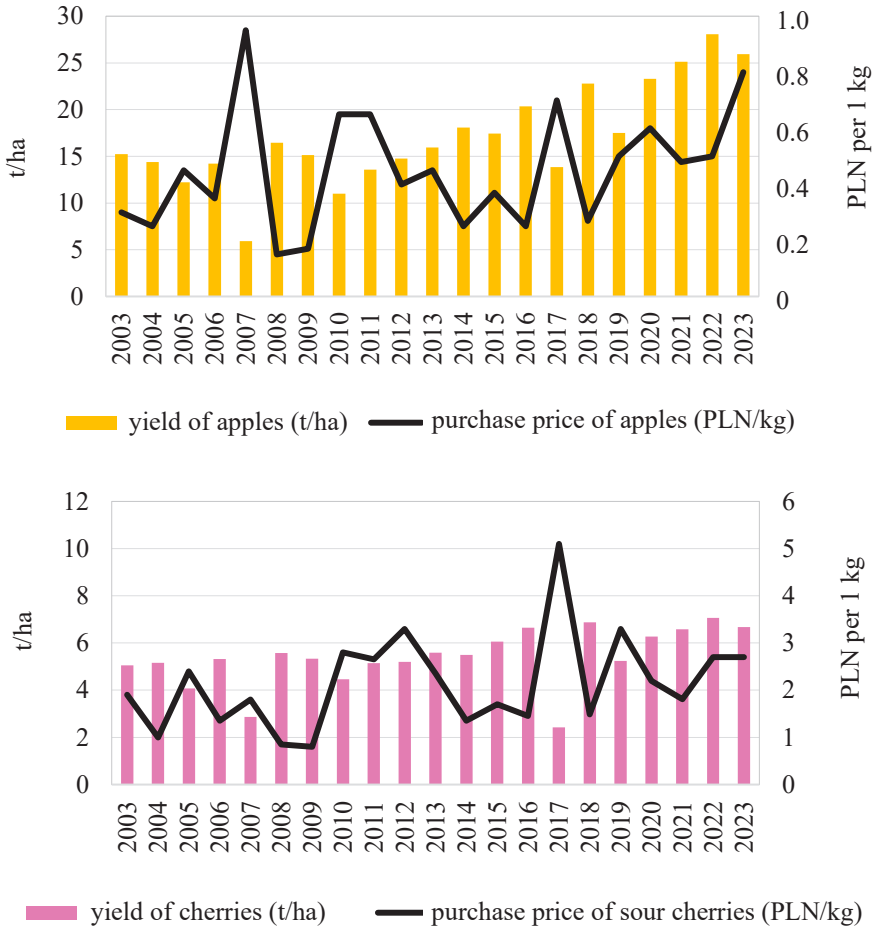

Figure 1. Yield and purchase prices of apples, sour cherries, raspberries and blackcurrants in the 2003-2023

Source: own calculations based on IERiGŻ-PIB (2005-2024) and GUS (2004-2024) data

181% higher than the average price in the four-year period preceding the emergency situation, whereas in 2017 it was 112% higher (Table 2). In 2007 the yield of sour cherries decreased by 42%, whereas in 2017 it was 59% lower than the four-year average. In the spring of 2017 sour cherry trees were particularly badly affected by frost, which resulted in a record low yield of sour cherries in Poland. In 2007 the purchase prices of sour cherries for freezing increased by only 8%, but in 2017 they reached an unprecedented record of 5.10 PLN per kg, which has not been broken ever since. In 2017 the purchase price of sour cherries was 198% higher than the average in the four preceding years.

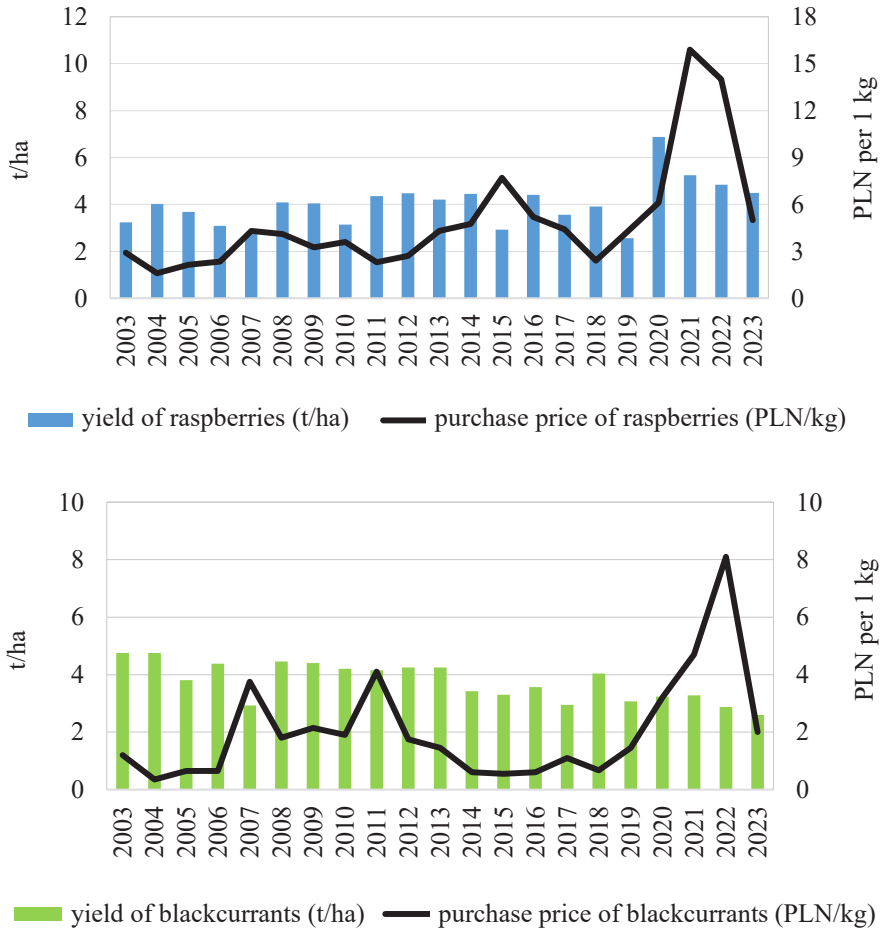

Figure 1. Cont.

In 2007 and 2017 frosts did not damage berry shrubs so badly as they did apple and sour cherry trees. In 2007 the yield of raspberries was 22% lower than the four-year average, whereas in 2017 it was 11% lower. In 2007 the purchase prices of raspberries rose to a record level of 4.30 PLN per kg, which was 91% higher than the average in the four preceding years. In 2017 the slight decrease in the yield of raspberries did not cause an increase in their purchase prices, which had been decreasing since 2015 and this downward trend continued that year. The spring frosts in 2007 significantly damaged blackcurrant plantations in Poland. The yield of blackcurrants was 34% lower than the four-year average. The lower yield resulted in a higher purchase price of blackcurrants. It increased significantly to 3.75 PLN per kg, which was almost five times more than in the

Table 2. Change in purchase price of fruits in comparison with the four-year average

Year	Apples for processing		Sour cherries for freezing		Raspberries		Blackcurrants	
	price	change (%)*	price	change (%)*	price	change (%)*	price	change (%)*
2003	0.30	–	1.90	–	2.90	–	1.20	–
2004	0.25	–	1.00	–	1.60	–	0.35	–
2005	0.45	–	2.40	–	2.15	–	0.65	–
2006	0.35	–	1.35	–	2.35	–	0.65	–
2007	0.95	181	1.80	8	4.30	91	3.75	426
2008	0.15	-70	0.85	-48	4.10	58	1.80	33
2009	0.17	-64	0.80	-50	3.25	1	2.15	26
2010	0.65	60	2.80	133	3.60	3	1.90	-9
2011	0.65	35	2.65	70	2.30	-40	4.10	71
2012	0.40	-1	3.30	86	2.70	-18	1.75	-30
2013	0.45	-4	2.35	-2	4.30	45	1.45	-41
2014	0.25	-53	1.35	-51	4.75	47	0.60	-74
2015	0.37	-15	1.70	-30	7.70	119	0.55	-72
2016	0.25	-32	1.45	-33	5.20	7	0.60	-45
2017	0.70	112	5.10	198	4.40	-20	1.10	38
2018	0.27	-31	1.49	-38	2.40	-56	0.67	-6
2019	0.50	26	3.30	36	4.25	-14	1.45	99
2020	0.60	40	2.20	-22	6.10	50	3.20	235
2021	0.48	-7	1.81	-40	15.90	271	4.70	193
2022	0.50	8	2.70	23	14.00	95	8.10	223
2023	0.80	54	2.70	8	5.00	-50	2.00	-54

* Change in comparison with the average in the four preceding years
Source: own calculations based on IERiGŻ-PIB (2005-2024) and GUS (2004-2024) data

previous year. The frosts in 2017 did not cause such a considerable decrease in the yield of blackcurrants, but the purchase price increased and was 38% higher than the average in the four years preceding the emergency situation.

In 2007 and 2017, due to frosts which occurred in Poland during the flowering and fruit setting period, many trees and shrubs shed flowers or fruit buds, which resulted in a lower yield of fruit. However, although trees and shrubs set few or no fruits, they were still treated with crop protection products, fertilised, and irrigated. Thanks to these treatments, these

trees and shrubs maintained good health and set flower buds in the following year. Both in 2008 and 2018, the weather conditions were favourable during the period of flowering and fruit setting on trees and shrubs. There were high yields, especially from the trees and shrubs which had lost buds in the previous year, produced no fruit and "rested". Both in 2008 and 2018 there were record high yields of fruit trees and shrubs in Poland, which resulted in lower prices of all types of fruit for processing.

The spread of the SarsCov2 virus caused a global pandemic, which began in 2020 and also affected the market of fruit for processing. Many countries introduced a ban on travelling, which resulted in the lack of available labour to harvest fruit. In consequence, fruit was not harvested, which disrupted the supply chain of raw materials and food products. As a result, some products were not available. At the same time, during the COVID-19 pandemic the health-beneficial model of nutrition was promoted. Consumers became increasingly interested in fruits and fruit products, as they contain vitamins and other minerals that are necessary to maintain good health. The emergency situation caused by the SarsCov2 virus had positive effects for the market of fruit for processing as the purchase prices of some fruits increased. In comparison with the previous year, in 2020 the purchase price of industrial apples increased from 0.5 PLN to 0.6 PLN per kg and it was 40% higher than the four-year average although the yield of apple trees increased by 33%. The purchase prices of other health-promoting fruits (superfruits), i.e. raspberries and blackcurrants, also increased. In 2020 the purchase price of raspberries for freezing was 50% higher than the four-year average. In 2021 it reached a record level of 15.9 PLN per kg. In 2020 the purchase price of blackcurrants was 235% higher than the average price in the four preceding years. In the subsequent years it continued to rise, reaching 4.7 PLN per kg in 2021 and a record level of 8.1 PLN per kg in 2022. The purchase prices of sour cherries for freezing decreased in 2020.

VARIATION OF FRUIT PURCHASE PRICES IN POLAND IN EMERGENCY SITUATIONS CAUSED BY HUMAN ACTIVITY

Emergency situations occurring due to other than natural causes resulted from human activity. In 2014 Russia started military aggression against Ukraine and annexed the Crimea. The European Union showed solidarity with Ukraine and applied restrictive measures against Russia (Council Regulation (EU) No. 269/2014). In response to the EU restrictions, Russia introduced an embargo on trade in agri-food products from the EU, including fruit. As a result, fruit exports to Russia, which was a key sales market for Polish producers, were limited (Kraciński, 2015; Ambroziak, 2017). Fruit produced for the Russian market was directed to the domestic market and to processing plants (Kraciński, Wicki, 2020). Due to the sudden, high supply of fruit for processing, buying stations

and processing plants lowered their prices. The purchase price of apples for processing decreased by 44%, from 0.45 PLN per kg in 2013 to 0.25 PLN per kg in 2014, which was 53% less than the four-year average. The purchase price of sour cherries for freezing decreased by 43%, from 2.35 PLN per kg in 2013 to 1.35 PLN per kg in 2014 (51% less than the four-year average). The purchase price of blackcurrants decreased from 1.45 PLN per kg in 2013 to 0.6 PLN per kg (74% less than the four-year average). In 2014 the purchase price of raspberries for freezing was 47% higher than the average price in the previous four years. Frozen raspberries were exported from Poland mainly to the EU member-states. The Russian embargo did not pose a threat to the dynamically developing frozen raspberry market in the EU (Zaremba, 2014).

On 24 February 2022 Russia invaded Ukraine, which started a war between these countries. In solidarity with Ukraine, the European Union introduced regulations liberalising trade between the EU member-states and Ukraine to help the latter fight the invader (Regulation (EU) 2022/870). Under the regulation, Ukraine was allowed to export fruit and fruit products to the EU duty-free. When the free trade regulation was introduced, the imports of fruit and fruit products from Ukraine to the EU member-states increased (Kierczyńska, 2024). Fruit and vegetable processing plants became interested in cheaper raw materials and products from Ukraine. In consequence, they offered lower purchase prices of fruit for processing to Polish producers. In 2022, i.e. the first year after the outbreak of the war, the purchase price of raspberries for freezing decreased slightly (by 12%), but in 2023 they dropped considerably from 14 PLN per kg to 5 PLN per kg, which sparked numerous protests from producers of these fruits in Poland (Kraciński, 2023; Rucińska, 2023). The purchase price of blackcurrants decreased from a record level of 8.1 PLN per kg to only 2 PLN per kg. The purchase price of sour cherries for freezing did not change, but the purchase price of industrial apples increased by 60% although Polish processing plants imported cheaper concentrated apple juice from Ukraine (Nosecka, 2023). The increase in the purchase prices of apples was related to the global increase in the demand for and prices of concentrated apple juice due to the decreased production and supply of orange juice on international markets, which can be substituted by concentrated apple juice (Nosecka, 2017b; Majtkowski, 2024).

SUMMARY

The emergency situations caused by the forces of nature (spring frosts) in 2007 and 2017 were accompanied by changes in the level of fruit yields and purchase prices in Poland. The spring frosts were the direct cause of fruit yield losses. However, they did not lead to a fruit production crisis, because lower yields were compensated by higher fruit purchase prices. This was particularly favourable for those producers who protected

their plantations with anti-frost installations and harvested fruit. The emergency situation caused by the COVID-19 pandemic was accompanied by relatively high purchase prices of raspberries and blackcurrants. The Covid-19 pandemic drew consumers' attention to healthy nutrition. Consumers became more interested in eating fruit and the prices of superfruits (raspberries, blackcurrants) increased. The emergency situations caused by military operations led to disruptions in international trade and changes in fruit purchase prices in Poland. In 2014 the higher supply of fruit, especially apples, resulted in lower purchase prices of these fruits. The emergency situation on the apple market in Poland was effectively counteracted by applying the crisis support mechanism, which consisted in withdrawal of the fruit from the market (Commission Delegated Regulation (EU) No. 932/2014). The emergency situation caused by the war in Ukraine was accompanied by higher import of fruit products from that country and a decrease in the purchase prices of fruit (mainly raspberries) in Poland. In order to prevent the crisis on the raspberry market, the Ministry of Agriculture and Rural Development engaged two state-owned companies to organise the purchase of raspberries so as to stabilise prices on the market (Portalspożywczy.pl, 2023).

BIBLIOGRAPHY

Ambroziak, A.A. (2017). Wpływ embarga Federacji Rosyjskiej na eksport jabłek z Polski w latach 2004-2015 (The impact of Russian Federation's embargo on export of apples from Poland in 2004-2015). *Roczniki Naukowe Ekonomii Rolnictwa i Rozwoju Obszarów Wiejskich*, *104* (1), 22-38. DOI: 10.22630/RNR.2017.104.1.2.

Bertolozzi-Caredio, D., Severini, S., Pierre, G., Zinnanti, C., Rustom, R., Santoni, E., Bubbico, A. (2023). *Risks and vulnerabilities in the EU food supply chain*. Luxembourg: Publications Office of the European Union. DOI: 10.2760/171825, JRC135290.

Bielza, M., Stroblmair, J., Gallego, J., Conte, C., Dittmann, C. (2007). Agricultural risk management in Europe. In: Presentation at the 101st EAAE Seminar "Management of Climate Risks in Agriculture". Berlin, Germany, http://Bielzaetal07_AgRiskMgtEurope_AEEABerlin_web.pdf, access: 19.08.2024.

Björck, A. (2016). Crisis typologies revisited: an interdisciplinary approach. *Central European Business Review*, *5* (03), 25-37.

Bundy, J., Pfarrer, M.D., Coombs, W.T. (2017). Crisis and crisis management: Integration, and research development. *Journal of Management*, *43* (6), 1661-1692. DOI: 10.1177/0149206316680030.

Commission Delegated Regulation (EU) No 932/2014 of 29 August 2014 laying down temporary exceptional support measures for producers of certain fruit and vegetables and amending Delegated Regulation (EU) No 913/2014. Official Journal, L 259, 30.8.2014.

Council Regulation (EU) No 269/2014 of 17 March 2014 concerning restrictive measures in respect of actions undermining or threatening the territorial integrity, sovereignty and independence of Ukraine. Official Journal, L 78, 17.3.2014.

GUS (CSO, Statistics Poland). (2004-2024). *Produkcja upraw rolnych i ogrodniczych w 2004 (-2024)* (Production of agricultural and horticultural crops in 2004 (to 2024), https://stat.gov.pl/obszary-tematyczne/rolnictwo-lesnictwo/uprawy-rolne-i-ogrodnicze/produkcja-upraw-rolnych-i-ogrodniczych-w-2004-r-,9,2.html, access: 05.-8.2-24.

IERiGŻ-PIB (Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej – Państwowy Instytut Badawczy, nstitute of Agricultural and Food Economics – National Research Institute). (2005-2023). *Rynek Owoców i Warzyw* (*Fruit and Vegetable Market*). Warszawa: IERiGŻ-PIB.

Kierczyńska, S. (2024). Imports of fruit preserves from Ukraine to EU countries in terms of free trade regulations with Ukraine. In: Presentation at the 189th EAAE Seminar "EU enlargement by (post-)war Ukraine: Implications for the agri-food markets". Poland, WULS-SGGW in Warsaw, September 18-20, 2024, Poland.

Kozłowski, Z., Nosek, W. (2008). *Sytuacje kryzysowe* (Crisis situations). Piła: Szkoła Policji, Wydział Dowodzenia.

Kraciński, P. (2015). Handel zagraniczny jabłkami w UE w kontekście rosyjskiego embargo. (The EU foreign trade of apples in the context of the Russian embargo), *Zeszyty Naukowe SGGW. Problemy Rolnictwa Światowego*, *15* (3), 83-92. DOI: 10.22630/PRS.2015.15.3.40.

Kraciński, P. (2023). *Maliny 2023. Wstrzymanie dostaw nierealne przy rozdrobnionym rynku.* (Raspberries 2023. Suspension of supplies is unrealistic in a fragmented market), https://www.sadyogrody.pl access: 28.06.2024.

Kraciński, P., Wicki, L. (2020). *Pozycja konkurencyjna jabłek i zagęszczonego soku jabłkowego na rynkach zagranicznych* (Competitive position of apples and concentrated apple juice on foreign markets). Warszawa: Wydawnictwo SGGW. DOI: 10.22630/SGGW.2020.9788375839609.

Luecke, R., Barton, L. (2004). *Crisis management: Master the skills to prevent disasters.* Boston, Mass.: Harvard Business School Press.

Majtkowski, P. (2024). *Sok pomarańczowy zdrożał o 300 proc. w ciągu dwóch lat* (Orange juice has become 300 percent more expensive in two years), https://wgospodarce.pl/analizy/146469-sok-pomaranczowy-zdrozal-o-300-proc-w-ciagu-dwoch-lat, access: 2024-11-19.

Nosecka, B. (ed.). (2007). *Rynek Owoców i Warzyw. Stan i Perspektywy*, nr 31 (*Fruit and Vegetable Market. Status and Prospects*, No. 31). Warszawa: IERiGŻ PIB.

Nosecka, B. (ed.). (2017a). *Rynek Owoców i Warzyw. Stan i Perspektywy*, nr 51 (*Fruit and Vegetable Market. Status and Prospects*, No. 51). Warszawa: IERiGŻ PIB.

Nosecka, B. (2017b). *Sytuacja na światowy rynku produktów ogrodniczych i jej wpływ na polski rynek ogrodniczy* (The situation on the world market of horticultural products and its impact on the Polish horticultural market). Warszawa: IERiGŻ-PIB.

Nosecka, B. (ed.). (2023). *Rynek Owoców i Warzyw. Stan i Perspektywy,* nr 63 (F*ruit and Vegetable Market. Status and Prospects*, No. 63). Warszawa: IERiGŻ PIB.

Nteka, N. (2021). Crises analysis and management. *Entrepreneurship*, *IX* (1), 64-77. DOI: 10.37708/ep.swu.v9i1.6.

Otwinowski, W. (2010). Kryzys i sytuacja kryzysowa (Crisis and crisis situation). *Przegląd Naukowo-Metodyczny Edukacja dla Bezpieczeństwa*, *2*, 83-89.

Portalspożywczy.pl. (2023). *Ogromne zainteresowanie plantatorów skupem malin. W ramach państwowego programu* (Huge interest of growers in the purchase of raspberries. As part of the state program), https://www.portalspozywczy.pl/owoce-warzywa/wiadomosci/ogromne-zainteresowanie-plantatorow-skupem-malin-w-ramach-panstwowego-programu,229833.html, access: 21.07.2023.

Regulation (EU) 2022/870 of the European Parliament and of the Council of 30 May 2022 on temporary trade-liberalisation measures supplementing trade concessions applicable to Ukrainian products under the Association Agreement between the European Union and the European Atomic Energy Community and their Member States, of the one part, and Ukraine, of the other part. Official Journal, L 152, 3.6.2022, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022R0870, access: 28.08.2024.

Rucińska, Z. (2023). *Duże protesty plantatorów malin. Powodem zbyt niska cena skupu owoców* (Large protests of raspberry growers. The reason for the too low purchase price of fruit), Rolnik Info, https://rolnikinfo.pl/duze-protesty-plantatorow-malin-powodem-zbyt-niska-cena-skupu-owocow-zr-zr-270623, access: 19.11.2024.

Rydzak, W. (2011). *Reputacja a działania informacyjne organizacji w sytuacjach kryzysowych i determinanty ich wyboru* (Reputation and information activities of organizations in crisis situations and determinants of their selection). Poznań: Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu.

Zaremba, Ł. (2014). Polski i światowy rynek malin i ich przetworów (Polish and global market of raspberries and their preserves). *Zeszyty Naukowe SGGW. Problemy Rolnictwa Światowego*, *14* (1), 148-156. DOI: 10.22630/PRS.2014.14.1.

***

SYTUACJE KRYZYSOWE A PRODUKCJA I CENY SKUPU OWOCÓW W POLSCE

Słowa kluczowe: sytuacja kryzysowa, kryzys, ceny producenta, owoce do przetwórstwa, COVID-19, wojna na Ukrainie

ABSTRAKT. W ostatnich latach w Polsce wystąpiły sytuacje kryzysowe powodujące trudności i zagrożenia dla producentów owoców. Były to m.in. silne przymrozki w okresie kwitnienia drzew i krzewów owocowych w latach 2007 i 2017, embargo na import produktów rolnych z krajów UE wprowadzone przez Federację Rosyjską w 2014 roku, pandemia COVID-19 w 2020 roku oraz agresja Rosji na Ukrainę w lutym 2022 roku. Celem badań była ocena zmian poziomu plonów i cen skupu owoców w latach wystąpienia wymienionych sytuacji kryzysowych, określenie czy sytuacje kryzysowe doprowadziły do kryzysów w produkcji owoców w Polsce, a także ocena sposobów wyjścia z kryzysów. W celu oceny siły zjawiska kryzysowego obliczono odchylenia plonu i cen skupu wybranych gatunków owoców (jabłek, wiśni, malin i porzeczek czarnych) od średniej z czterech lat poprzedzających wystąpienie sytuacji kryzysowej. Z badań wynika, że sytuacjom kryzysowym wywołanym wiosennymi przymrozkami towarzyszyły straty w plonach owoców. Nie doprowadziło to jednak do kryzysu w produkcji owoców, ponieważ wzrost cen skupu owoców zrekompensował producentom obniżkę plonów. Wzrost podaży jabłek w 2014 roku, po wprowadzeniu przez Rosję embarga, skutkował obniżką cen skupu tych owoców. Zastosowano mechanizm wycofania owoców z rynku, aby przeciwdziałać kryzysowi. Pandemia COVID-19 zwróciła uwagę społeczeństwa w kierunku zdrowego odżywiania, czemu towarzyszyło zainteresowanie spożyciem owoców i wzrost cen tych gatunków, które uważane są za tzw. superfruits (maliny, czarne porzeczki). Sytuacjom kryzysowym wywołanym działaniami wojennymi, które przejawiały się zakłóceniami w handlu międzynarodowym towarzyszyły zmiany cen skupu owoców w Polsce. Sytuacji kryzysowej wywołanej wojną w Ukrainie towarzyszył zwiększony import przetworów z owoców z tego kraju i spadek cen skupu owoców w Polsce, głównie malin.

AUTHOR

SYLWIA KIERCZYŃSKA, PHD ENG.

ORCID: 0000-0003-1122-1506
Poznań University of Life Sciences
Faculty of Economics
Department of Law and Enterprise Management in Agribusiness
e-mail: sylwia.kierczynska@up.poznan.pl

Proposed citation of the article:
Kierczyńska, S. (2025). The effects of emergency situations on fruit production and purchase prices in Poland. *Annals PAAAE*, *27* (1), 88-101.