

ISSN 1644-0757

**Acta Scientiarum Polonorum** – ogólnopolskie czasopismo naukowe polskich uczelni rolniczych, publikuje oryginalne prace w następujących seriach tematycznych:

**Agricultura** – Agronomia

Wydawnictwa Uczelniane Uniwersytetu Technologiczno-Przyrodniczego w Bydgoszczy  
ul. Ks. A. Kordeckiego 20, 85-225 Bydgoszcz, tel. 52 374 94 36, fax 52 374 94 27

**Biologia** – Biologia

Wydawnictwo Uniwersytetu Przyrodniczo-Humanistycznego w Siedlcach  
ul. Bema 1, 08-110 Siedlce, tel. 25 643 15 20, fax 25 644 20 45

**Biotechnologia** – Biotechnologia

**Geodesia et Descriptio Terrarum** – Geodezja i Kartografia

**Medicina Veterinaria** – Weterynaria

Wydawnictwo Uniwersytetu Przyrodniczego we Wrocławiu  
ul. Sopocka 23, 50-344 Wrocław, tel./fax 71 328 12 77

**Technica Agraria** – Inżynieria Rolnicza

**Hortorum Cultus** – Ogrodnictwo

Wydawnictwo Uniwersytetu Przyrodniczego w Lublinie  
ul. Akademicka 13, 20-033 Lublin, tel. 81 445 67 11, fax 81 533 37 52

**Piscaria** – Rybactwo

**Zootechnica** – Zootechnika

Wydawnictwo Uczelniane Zachodniopomorskiego Uniwersytetu Technologicznego w Szczecinie  
al. Piastów 50, 70-311 Szczecin, tel. 91 449 40 90, 91 449 41 39

**Silvarum Colendarum Ratio et Industria Lignaria** – Leśnictwo i Drzewnictwo

**Technologia Alimentaria** – Technologia Żywności i Żywnienia

Wydawnictwo Uniwersytetu Przyrodniczego w Poznaniu  
ul. Witosa 45, 61-693 Poznań, tel. 61 848 78 07, fax 61 848 78 08

**Administratio Locorum** – Gospodarka Przestrzenna

Wydawnictwo Uniwersytetu Warmińsko-Mazurskiego w Olsztynie  
ul. Heweliusza 14, 10-724 Olsztyn, tel. 89 523 36 61, fax 89 523 34 38

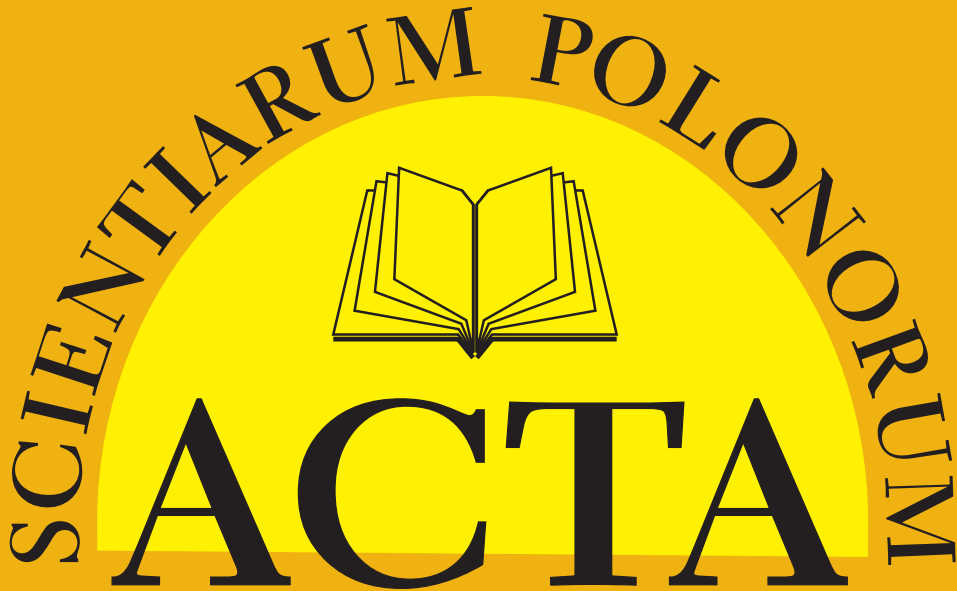
**Architectura** – Budownictwo

**Oeconomia** – Ekonomia

Wydawnictwo Szkoły Głównej Gospodarstwa Wiejskiego w Warszawie  
ul. Nowoursynowska 166, 02-787 Warszawa, tel. 22 593 55 20, fax 22 593 55 21

**Formatio Circumiectus** – Kształtowanie Środowiska

Wydawnictwo Uniwersytetu Rolniczego w Krakowie  
al. 29 Listopada 46, 31-425 Kraków, tel. 12 662 51 57, 12 662 51 59



Oeconomia

Oeconomia

14 (3) 2015

14 (3) 2015



# **ACTA SCIENTIARUM POLONORUM**

Czasopismo naukowe założone w 2001 roku przez polskie uczelnie rolnicze  
Scientific Journal established in 2001 by Polish Life Sciences Universities

**Oeconomia**

Economics

Ekonomia

14 (3) 2015



Bydgoszcz Kraków Lublin Olsztyn  
Poznań Siedlce Szczecin Warszawa Wrocław

### ***Acta Scientiarum Polonorum Programming Board***

Wiesław Nagórko (Warszawa), Ryszard Żróbek (Olsztyn), Józef Bieniek (Kraków),  
Krzysztof Szkucik (Lublin), Ewa Sobecka (Szczecin),  
Janusz Prusiński (Bydgoszcz), Jerzy Sobota (Wrocław) – chairman,  
Stanisław Socha (Siedlce), Waldemar Uchman (Poznań)

### ***Oeconomia Scientific Board***

Carol J. Cumber (South Dakota State University, Brookings, USA),  
Michael Ireland (University of Plymouth, Plymouth, UK),  
Roman Kisiel (University of Warmia and Mazury, Olsztyn, PL),  
Joseph Andrew Kuzilwa (Mzumbe University, Tanzania),  
Vera Majerova (Czech University of Life Sciences, Prague, CZR),  
Wiesław Musiał (University of Agriculture in Krakow, Kraków, PL),  
Janina Sawicka (Warsaw University of Life Sciences – SGGW, Warszawa, PL)  
– chairperson,  
Harun Ucak (Muğla Sıtkı Koçman University, Muğla, TR),  
Dorota Witkowska (University of Łódź, Łódź, PL)

### **Editing committee**

Jan Kiryow – Warsaw University of Life Sciences Press,  
Paulina Stolarczyk – WULS-SGGW – *Oeconomia* secretary,  
Paulina Tuka – WULS-SGGW – *Oeconomia* secretary,  
Renata Marks-Bielska – University of Warmia and Mazury in Olsztyn – thematic editor,  
Tomasz Wojewodziec – University of Agriculture in Krakow – thematic editor,  
Wojciech Pizło – WULS-SGGW – thematic editor,  
Iwona Pomianek – WULS-SGGW – thematic editor,  
Aleksandra Matuszewska-Janica – WULS-SGGW – statistical editor,  
Kuo-Liang “Matt” Chiang – South Dakota State University – language consultant

***The printed version of Acta Scientiarum Polonorum Oeconomia is an initial version  
of the journal***

Editorial staff

Anna Dołomisiewicz, Krystyna Piotrowska

ISSN 1644-0757

Edition: 200 prints

© Copyright by Warsaw University of Life Sciences Press

Wydawnictwo SGGW, Nowoursynowska 166, 02-787 Warszawa



tel. 22 593 55 20 (-22; -25 – sale), fax 22 593 55 21

e-mail: [wydawnictwo@sggw.pl](mailto:wydawnictwo@sggw.pl)

[www.wydawnictwosggw.pl](http://www.wydawnictwosggw.pl)

Print: Agencja Reklamowo-Wydawnicza A. Grzegorzczak, [www.grzeg.com.pl](http://www.grzeg.com.pl)

### ***From the Scientific Board***

*There has been the fourteenth year of the Acta Scientiarum Polonorum Oeconomia publishing. The Acta is the periodical including several thematic series with uniform graphics and similar format. The publication was set up by group of enthusiasts – employees of life sciences universities and has been published under the patronage of rectors of these universities. Constant involvement of academic society in increasing substantive and editorial level of the series, with efforts of the authors, the Programming Board and the Scientific Boards, has contributed to placing the Acta Scientiarum Polonorum (and our Oeconomia series) on the noticeable position in academic research society. Articles can be prepared in English with Polish title, abstract and keywords. Moreover, we publish latest issues in English only. The Scientific Board of the Oeconomia series, concerning the publication range, focuses its attention both on substantive content and precision of the form. The articles are revised in “double-blind review” process. Whole content of the Acta Scientiarum Polonorum Oeconomia is available in electronic version on the following website [http://acta\\_oeconomia.sggw.pl](http://acta_oeconomia.sggw.pl). We are glad to inform that Acta Scientiarum Polonorum Oeconomia are indexed within the AGRIS-FAO, EBSCO, SIGŻ, Copernicus Index, AGRO, BazEkon. Since 2013 each article published in Acta Sci. Pol. Oeconomia has 10 points at the Ministry of Science and Higher Education ranking list.*

*Please send the articles on one of following e-mail addresses:*

*janina\_sawicka@sggw.pl*

*acta\_oeconomia@sggw.pl*

*While sending a printout, please attach also the electronic version on CD or DVD. Letters including note “the Acta Scientiarum Polonorum Oeconomia” should be sent on the following address:*

*Prof. dr hab. Janina Sawicka  
Department of European Policy, Public Finances and Marketing  
Faculty of Economic Sciences  
Warsaw University of Life Sciences  
Nowoursynowska 166, 02-787 Warsaw, Poland  
tel.: (+4822) 593 40 70; fax: (+4822) 593 40 77*

*Yours sincerely  
Janina Sawicka  
Chairperson of the Scientific Board of the Acta  
Sci. Pol. Oeconomia series*

