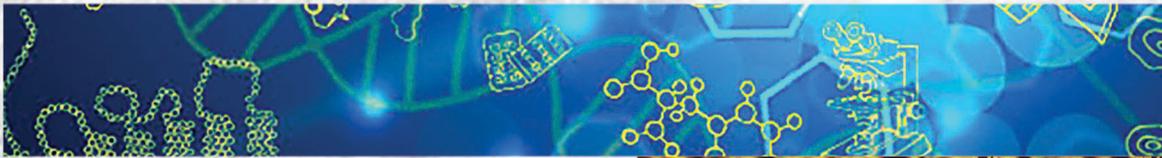




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SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT



Book of Abstracts



Belgrade, 2021

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International Scientific Conference

SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT

BOOK OF ABSTRACTS

February, 2021

Belgrade, Serbia

Publisher:

Institute of Agricultural Economics, Belgrade, Serbia

Editors:

Jonel Subić, Ph.D.

Predrag Vuković, Ph.D.

Jean Vasile Andrei, Ph.D.

Technical arrangement and printing:

SZR NS MALA KNJIGA +

Zetska Street no. 15,

21000 Novi Sad, Republic of Serbia,

Phone: +381 21 64 00 578

Technical preparation and typesetting:

Vladimir Sokolović

Language editor:

Natascha Kovačević Turksoy

ISBN (e-book) 978-86-6269-095-1

The publisher is not responsible for the content of the abstracts of scientific papers and opinions published in the Book of Abstracts.

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Publication of Book of Abstracts was financially supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

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PREFACE

The Book of Abstracts is prepared as the result of the scientific research supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

The Book of Abstracts includes selected abstracts from the articles presented at the International Scientific Conference – Sustainable Agriculture and Rural Development which was held in Belgrade on December 17-18, 2020.

In the Book of Abstracts are included the abstracts of articles from Serbia, along with the invited and other articles from abroad, prepared by foreign authors, which are IAE, Belgrade associates, and whose institutions have close scientific, professional and technical cooperation with the IAE, Belgrade.

The Book of Abstracts addresses the wider audience by being scientifically and practically focused on all segments of sustainable agriculture and rural development.

Publisher and editors are not responsible for the content of the abstracts of scientific papers and opinions published in the Book of Abstracts, as they represent the author's point of view.

Publishing of the Book of Abstracts was financially supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

In Belgrade,
February, 2021

Editors:
Jonel Subić, Ph.D.
Predrag Vuković Ph.D.
Jean Vasile Andrei, Ph.D.

PLENARY SECTION

INNOVATIONS IN THE AGRO-INDUSTRIAL COMPLEX AS A FACTOR IN ENSURING THE RUSSIAN FOOD SECURITY

Anna Ivolga¹, Irina Shakhramanian²

Abstract

The paper considers the prospects for sustainable development of the agro-industrial complex, which ensures the country's food security and access to world food markets by the latest scientific achievements. The authors prove that the achievement of technological independence in the agricultural sector and the development of new technologies is an urgent task facing the country. In accordance with this, a set of measures aimed at solving this large-scale task is proposed.

Key words: *agribusiness, agro-industrial complex, innovation, food security, food and processing industry.*

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PRECISION AGRICULTURE: KEY CONCEPTS

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Abstract

The sustainable use of natural resources by employing technical and social modernization of agriculture, is a constant preoccupation, given current challenges related to climate changes, maintenance of competitiveness for agricultural producers and the decrease of dependence to non-renewable resources. In a situation where the world population is constantly growing and the agricultural fund is limited and with clear trends of deterioration, agricultural research has played a particularly important role in increasing production and in the most rational exploitation of existing resources.

The concept of precision agriculture involves regulating the inputs to the agricultural system (seeds, fertilizers, pesticides) so that they are distributed in precise location, quantity, and time needed. Measuring the various working parameters through sensors and transducers, analyzing the information received through computer systems and specific software, and sending commands to change other parameters on tractors and agricultural machines created the Smart farming system.

Key words: *agriculture development, technological innovation, precision farming.*

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POVERTY AND REGIONAL AND RURAL DEVELOPMENT DISPARITIES IN ROMANIA

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Adrian Băneș⁵, Andreea Feher⁶, Miroslav Raicov⁷*

Abstract

The evolution of the living standard in Romania has been affected by numerous factors along the past three decades, from the transition to the market economy and the EU pre-accession periods to the EU integration during two programming periods. The poverty rates, the severe material deprivation, along with poverty and exclusion risks are still oscillating within the frame of an unconsolidated regional development growth. The developments over the past twelve years have, to a certain extent, alleviated the situation of the most vulnerable rural households, yet the regional disparities indicate insufficient inner convergence efforts for a balanced territorial development. Further territorial cohesion programming is required to reduce the discrepancies and the targeted development with particular accent for the socially vulnerable categories.

Key words: *poverty, agriculture, regional disparities, development gaps.*

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BIOEAST INITIATIVE AND BIOEASTSUP PROJECT: RESULTS OF CEE COUNTRIES COOPERATION FOR BIOECONOMY

Dan Marius Voicilas¹

Abstract

As the bioeconomy concept is one of the main trends in economy, the new national policies and strategies promoted by countries must adhere to the lines established at the EU level. For European countries, both EU and non-EU, the bioeconomy will have a major role in their national economy. The aim of this paper is to set forth the bioeconomy concept in EU and the main actions for Central and Eastern European countries in this field, thus far. These are BIOEAST Initiative and BIOEASTsUp H2020 Project. For this analysis, we use official documents created at the EU level by the EU institutions, along with the results from the BIOEAST Initiative and BIOEASTsUP project. The research, which is based on document analysis, comparisons and forecast, offers a broad view on the bioeconomy strategy at the EU level and especially on the level of the development for the CEE countries.

Key words: *bioeconomy, EU strategy, CEE countries, Bioeast initiative, BioeastUp project.*

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THE ROLE OF SOIL BIOTA IN AGRICULTURE: ENHANCING ECOSYSTEM SERVICES IN BULGARIAN FARMS

*Kristina Todorova*¹

Abstract

Agricultural activities in some cases might disrupt the natural soil condition and create environmental risks. However, in recent years there is a tendency for a positive change in farmers' awareness and attitude towards conservational practices, such as provision of agri-environmental and organic agriculture. The aim of this paper is to present the potential for enhancing soil fertility as ecosystem service in farmlands in Bulgaria. This paper presents several practices in Bulgaria, which are believed to have the potential for maintaining good environmental status of soils, hence the provision of soil fertility as ecosystem service.

Key words: *ecosystem services, soil quality, organic farming.*

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BIOWASTE RECYCLING AS A SOLUTION TOWARDS A GREENER ECONOMY IN THE EUROPEAN UNION

Raluca Ignat¹, Marius Constantin²

Abstract

The European Commission aims at making Europe climate neutral in 2050 through a set of policies assumed in The European Green Deal. In view of this important goal, the main purpose of this research paper was to highlight how the European Union Member States have progressed towards becoming climate neutral, especially focusing on two key factors: the recycling rate of municipal waste and the amount of recycled bio-waste per capita. Based on the previously mentioned indicators, a cross-sectional econometric model was designed which indicates that 63.62% of the variation of the recycling rate of municipal waste is explained by the variation of the recycled bio-waste per capita. Therefore, in order to meet one of the targets of the Waste Framework Directive – reaching a recycling rate of municipal waste of 50% by 2020, the results of this study are meant to encourage recycling, as each contribution counts towards consolidating the desirable greener economy.

Key words: *recycling, waste, green economy, European Union.*

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CHINA-SERBIA AGRICULTURAL TRADE: PAST PERFORMANCES AND FUTURE EXPECTATIONS

Vasilii Erokhin¹, Gao Tianming²

Abstract

Currently, China is one of the world's largest consumers of food, which makes a trade with China profitable for countries specializing in the production of various kinds of agricultural products. In the past few years, Serbia has managed to significantly increase the value of agricultural exports to China, although only in a few positions. This paper estimates the opportunities for more mutually beneficial involvement of both Serbia and China in agricultural trade with each other based on their comparative advantages. The use of Balassa's Revealed Comparative Advantage method allowed the author to identify mismatches between competitive positions and the current trade balance for certain categories of agricultural products. The study concludes with the identification of the categories of agricultural products for which the export from Serbia to China should be encouraged.

Key words: *agricultural trade, China, export, import, revealed comparative advantage, trade balance.*

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BOOK OF ABSTRACTS

SHARING ECONOMY PERSPECTIVES FOR A SUSTAINABLE AGRICULTURE AND TOURISM DEVELOPMENT

Alba Demneri Kruja¹, Geri Ruci²

Abstract

This research is focused on ways and risks of implementing sharing economy especially in Albania which represents a developing country, with agriculture dominating the economy and employing approximately 40% of the workforce. These collaborative platforms provide them with opportunities on setting-up technology-based enterprises without the need of high capital investments. The research proposes that even though there is a hesitation in post-communist countries on co-operatives, a democratic, transparent and efficient model of collaboration on arranging goods and services, they may explore the contingency while implementing the sharing economy platforms especially in agriculture and tourism sectors, simultaneously focusing on their feature innovations to match the market socio-economic challenges.

Key words: *collaborative economy, agriculture, tourism, sustainability, Albania.*

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STUDY ON THE SCOPE AND POTENTIAL OF ECOLOGICAL AND CONVENTIONAL SURFACES IN ROMANIA

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Abstract

The present study aims to analyze comparatively the cultivated areas in conventional and ecological system, in order to determine their share of the agricultural area of Romania, in the period 2014-2019, in the eight development regions. From this research hypothesis, it is intended to carry out a preliminary study, in order to identify the size of available areas, to be converted to organic farming, in the context of the new CAP.

Key words: *conventional and ecological, research, surfaces.*

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RESEARCH OF THE EFFICIENCY OF PROMOTION OF A TOURIST PRODUCT IN THE INTERNET SPACE

Anastasia Masalova¹, Anna Ivolga²

Abstract

The influence of the Internet on human life is steadily increasing. In the article, the features of the use of social networks and the dissemination of information about travel products using specific social networks, and both positive and negative aspects of online promotion are shown, along with the features of audience involvement in the process of communication with a travel organization online.

Key words: *tourism product, Internet, online space, promotion, social networks, search engines.*

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INNOVATIONS IN THE FUNCTION OF COMPETITIVE ADVANTAGE OF BAZAARS ON MARKET¹

Boris Kuzman², Nedeljko Prdić³, Anton Puškarić⁴

Abstract

By analyzing the importance of bazaars on domestic market we want to ascertain and acknowledge their historical, modern and future role on market of agriculture products. Innovations, as continuous adjustments to market conditions, deem necessary adoption of changes in doing business. The objective of this paper is to emphasize the importance of innovations in business and good communication with public on the bases of social marketing. Results of the research have provided a solid foundation for conclusion that the implementation of innovations may contribute to the competitive advantage for bazaars on the market. The conclusion is as well that the activities of social marketing may lead to a better communication with customers for fulfillment of the basic role of bazaars for supply of fresh agriculture products for residents, and acknowledging their importance.

Key words: *innovations, investments, bazaars, competitive advantage, market, social marketing.*

1 This paper is a part of the research supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

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MARGINALIA ON THE ECONOMIC SITUATION OF SMALL FARMERS

Božo Drašković¹, Dimitrije Aleksić², Zoran Rajković³

Abstract

Available agricultural land as a natural, productive capital is the primary condition which determines the economic and social position of small and medium individual agricultural producers, organized as agricultural holdings. Depending on the structure of production, i.e. the structure of growing production crops, the quality of land and capital equipment with mechanization on the one hand, and market trends on the other hand, it is conditioned as a dependent variable by the economic and social position of the rural population in Serbia. The situation of the rural agricultural population is deteriorating or improving depending on the market trends, short-term, medium-term and long-term economic policy measures and international competition. Economic measures of strong subsidies implemented in EU countries significantly worsen the economic position of the rural agricultural population in Serbia. Therefore, in Serbia, the size of holdings is not crucial for the position of the rural population, but the impact of unequal competition created and distorted disproportionately by subsidies per hectare of agricultural land, which is provided for farmers in EU countries as opposed to farmers in Serbia. Deformed non-competitiveness of our small agricultural producers is one of the long-term key factors influencing the extinction of villages in Serbia. In the past three decades, economic policy in Serbia did not have a valid answer to this problem.

Key words: *farmers, land, holdings, agriculture, EU countries.*

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TRANSFORMATION FROM URBAN TO RURAL TOURISM DURING THE COVID-19 PANDEMIC: THE CASE OF SERBIA

Drago Cvijanović¹, Danijela Pantović², Nataša Đorđević³

Abstract

The COVID-19 pandemic led to the implementation of many restrictive measures to prevent it, which resulted in the decline in tourist arrivals and overnight stays. Due to the pandemic, various restrictive measures have also been applied in Serbia in order to prevent the spread of the virus e.g., banning the public gatherings, various restrictions for hotels, and restaurants, along with other measures. Although there is a decline in the number of tourist arrivals in Serbia during 2020, there is also a growing interest in rural tourism in Serbia. This paper examines whether there have been changes in travel plans in 2020 due to the pandemic, and whether urban or rural tourist destinations in Serbia or abroad are preferred during 2020. The data were collected by a survey, while their analysis and processing were done with the use of the Statistical Package for the Social Sciences (SPSS).

Key words: *rural tourism, Serbia, COVID-19, pandemic, tourist destination.*

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PROTEIN CONTENT IN BEAN GRAIN GROWN ACCORDING TO SUSTAINABLE ECOLOGICAL PRINCIPLES

Gordana Dozet¹, Marijana Jovanović Todorović², Mirjana Vasić³, Vojin Đukić⁴, Marija Cvijanović⁵, Zlatica Miladinov⁶, Gorica Cvijanović⁷

Abstract

The research has been conducted during a three-year period in order to determine the protein content in bean grains grown by organic principles and to choose more suitable variety for farming in organic production. The field experiment was set by a split-plot design in 4 repetitions on calcareous chernozem. The large plots were cropped with varieties Maksa and Zlatko, while control subplot was treated by agro-technical treatments permitted in organic production. In the research, the starting hypothesis was that the protein content in bean grains will depend on variety and applied agro-technics in organic bean growing technology. The protein content in bean grain was statistically significantly dependent on agro-ecological conditions during the production year, variety and applied agro-technics. For the production of bean by organic principles, Maksa variety is recommended. It is possible to achieve high protein content in beans grown in accordance with the principles of sustainable ecological development.

Key words: *sustainable ecological development, beans, protein content.*

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FINANCING AS DEVELOPMENT FACTOR IN THE HOP PRODUCTION AND BREWERY IN SERBIA

Gordana Radović¹, Radovan Pejanović², Zorica Vasiljević³

Abstract

The hop production in Serbia has been steadily declining since the Second World War. There were 1,500 hectares under these plantations in 1960, 245 hectares in 2004, 70.6 hectares in 2009, and only 8 hectares in 2019. The reasons for such situation are numerous. The authors believe that the financing is a significant development factor of the hop production and brewing in Serbia. In order to increase the presence of hops in the fields, and thus provide domestic raw materials for the development of craft breweries, it is important to define adequate measures of domestic agricultural policy, as well as to quantitatively and qualitatively improve existing sources of funding.

Key words: *hop, development, sources of financing, agricultural policy, Serbia.*

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ECONOMIC EFFECTS OF PLUM PLANTATION ESTABLISHMENT¹

Jonel Subić², Marko Jeločnik³, Lana Nastić⁴, Jean Vasile Andrei⁵

Abstract

Plum is the most important fruit species in the Republic of Serbia both in terms of produced quantities and in the areas under plum plantations. In line with importance of this fruit species, the main objective of the paper is to determine the economic effects of investing in establishment of plum plantation at the 10 hectares. The analysis was performed based on the data gained from the farm of individual agricultural producer from the city of Čačak. Establishment of the plum orchard considers the use of the variety “Čačanska lepotica”. Assessment of the investment effects has been done based on the use of dynamic methods for investment evaluation, while the analysis of the investment sensitivity under the conditions of risk was also performed. According to the obtained results, it could be concluded that the investment in plum orchard establishment is profitable.

Key words: *plum, plantation establishment, investment, risk.*

1 This research was funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

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AGRICULTURAL SECTOR RESULTS IN THE FUNCTION OF SUSTAINABLE DEVELOPMENT OF SERBIA'S ECONOMY

Jugoslav Aničić¹, Vuk Miletić², Dušan Aničić³

Abstract

The achieved business results of the companies from the agricultural sector, on one hand, along with the natural resources and favorable climatic factors, on the other hand, undeniably indicate great opportunities for intensive and efficient development of this sector and increase in its international competitiveness. In order to achieve that, limiting factors in the development of agriculture should be eliminated, among which the most important are unfavorable financing conditions and low level of public and private investments in the agricultural sector. Agricultural policy makers should insist on structural changes in the agricultural sector that will lead to an increase in the share of higher value-added products in total production and supply. In doing so, the principles of sustainable development must be applied, which will, in the long run, give economic effects and improve the quality of life of the population.

Key words: *agriculture, sustainable development, enterprise, Serbia.*

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POSITION OF HOLDERS OF RIGHT TO RETURN LAND IN THE PROCEDURE OF RESTITUTION AND LESSEE OF LAND¹

Ljiljana Rajnović², Zoran Brljak³, Snežana Cico⁴

Abstract

In this paper, the authors analyze the status of the holder of the right to restitution of the confiscated land in relation to the holder of the right to lease the land subject to restitution and thus the rank of application of regulations on agricultural land in the restitution procedure in the Republic of Serbia. The return of property confiscated during the communist period is part of the transition process, which implies comprehensive changes in the state, including privatization of state-owned property and market operations on the principles of private property and competition, but also a need to correct injustice to former owners. According to the regulations of the Republic of Serbia, restitution is mandatory, but in practice it is realized very slowly, especially when the subject of restitution is the return of agricultural land, although this process realizes one of the basic human rights of citizens, defined in the international agreement, the UN Universal Declaration of Human Rights, the right to free enjoyment of private property. In this paper, the authors analyze the conditions for the return of agricultural land e.g., the conflict of interest of the owner of the returned property and the holder of the right to lease on the returned property, and the implemented solutions in practice, on the example of a local government unit.

Key words: *restitution, holder of the right to return, legitimate expectation, land lease, principles of the constitution, discrimination.*

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MICROECONOMIC ANALYSIS OF MANAGEMENT IN HUNTING GROUNDS IN SERBIA¹

Marija Popović², Zoran Popović³

Abstract

A research work into the profit of hunting ground game users was conducted in four hunting grounds within three hunting regions managed by hunter associations in Serbia. Both a total registered breeding stock, and big and small game bag record (roe deer, wild boar, hare, pheasant, quail, mallard, wolf and fox) in 2017/18 were analyzed. On the basis of the analysis, it was concluded that there is a difference in total profit and in the profit per 100 hectares of total area of hunting ground between different hunting ground users in Serbia. The highest total profit of game bag record is realized by Dubrava hunting ground amounting to EUR 19,636. The highest profit per 100 hectares of total area is also realized by Dubrava hunting ground amounting to EUR 55, followed by Jadar hunting ground amounting to EUR 39, Takovo hunting ground amounting to EUR 26 and Klisura hunting ground amounting to EUR 13. The profit per surface unit varies considerably among different hunting grounds and among the hunting grounds of the same region depending considerably on the intensity of management of wild game populations in hunting grounds.

Key words: *game, hunting grounds, income, game bag record.*

1 This research paper is part of project research work per Contract no. 451-03-68/2020-14/20016 of 24.01.2020 financed by the MNTR of the Republic of Serbia.

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ROMANIAN AGRICULTURAL RESEARCH AND THE VIABILITY OF FARMING SYSTEMS

Marilena Potârniche Berheci¹

Abstract

Ensuring the viability of agricultural systems, set up to obtain crop and animal production, requires balancing them in economic terms, on the basis of strong ecological foundations and approaches to the optimum exploitation of biological assets, thus creating the conditions for abundant and constant crops, with increasingly efficient productivity.

The discussed topic, sustainable agricultural development, was dealt with in the literature by a number of theorists who generally drew attention to the impact on the environment of society and the economy. Experts' conclusions on the continued widespread use of intensive farming based solely on industrialization and chemically-intensive methods, show that these are not the solution to sustainable economic development.

The solution found in sustainable agriculture is proving to be the viable alternative to intensive agriculture, as being essential to promote environmental systems and technologies, responsible also for meeting the needs of future generations to develop harmoniously by focusing on maintaining and improving the viable Romanian varieties of crops.

The aim of this work is also to highlight the link between the changes in the Romanian agriculture, in the context of the implementation of the European agricultural policy, the integration within the common market, and the progress made in the degree of implementation of information technology within Romanian farms.

Key words: *agricultural systems, sustainable agriculture, intensive farming, eco-biological products.*

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SUSTAINABLE DEVELOPMENT PRINCIPLE IN THE FIELD OF ENVIRONMENTAL PROTECTION

Milan Počuča¹, Jelena Matijašević²

Abstract

The preservation and protection of the environment represents an imperative in modern society. The environment is an integral part of the concept of sustainable development, which, among other things, means that this concept is based on the balance between the social, economic and environmental aspects of the development of society. Therefore, sustainable development as a concept refers to the equality of environmental protection as one of the goals, in relation to economic and social development. After a brief introductory observation on the essential aspects of sustainable development as a concept, the paper discusses in more detail the conceptual definitions and principles of sustainable development management and the sustainable development principle as one of the essential principles of environmental protection.

Key words: *sustainable development, environmental protection, economic efficiency, social responsibility.*

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POSSIBILITY OF ORGANIC PRODUCTION IN GOATRY

Milivoje Urošević¹, Radomir Mandić², Natalija Gritner³

Abstract

Organic goat production in Serbia is promising, considering that the number of heads is around 200,000. The principles of organic production in goat breeding should be applied in the following conditions: choice of head, procurement of kids, meat production, food, replacement, treatment, prevention, illness, therapy, medicines, records, reproduction, castration, binding, transport, accommodation, movement, floor, fertilization, manure, marking, surface, hoofs. Since organic production is expensive, state support is needed.

Key words: *organic goat production, Serbia, principles of organic production, state support.*

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SELECTION OF APPLE HARVESTING MACHINE BY THE USE OF FUZZY METHOD OF MULTI-CRITERIA ANALYSIS

Miroslav Nedeljković¹, Adis Puška², Milorad Đokić³, Velibor Potrebić⁴

Abstract

Rapid development of agricultural production has imposed the need for use of modern machines for the realization of required production operations. In line with that, according to the multi-criteria decision-making, i.e., by the use of CRITIC method and MARCOS fuzzy method, the selection of a machine for apple harvesting (apple tree shaking) was performed. Gained results show that selection among three alternatives, i.e. manual apple tree shaker with hydraulic or pneumatic drive, tractor carried (hydraulic) apple tree shaker, apple tree shaker on a towed machine, proved the second alternative to be the best. The choice among the offered options was made based on seven predefined criteria set by the experts from the researched subject area. The importance of research is found in adequate application of the multi-criteria analysis methods, especially fuzzy methodology, in the process of selecting the most suitable option in apple harvesting machines (apple tree shakers).

Key words: *apple harvesting, multi-criterion decision making, method CRITIC, method MARCOS, fuzzy logic.*

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ANALYSIS OF CONDITION OF FOREST OF THE TOWN OF SMEDEREVO IN ACCORDANCE WITH SUSTAINABLE RURAL DEVELOPMENT¹

Nada Mijajlović²

Abstract

Forests are an important factor in improving the environment and forest management in Serbia is regulated at both the state and local level. In this paper, forest complexes on the territory of the city of Smederevo as the administrative center of the Danube region will be considered. This paper has the goal to analyze the state of the forest fund of the city of Smederevo and the possibilities of its improvement in the context of sustainable rural development. The city of Smederevo, as a strong industrial center of the Danube region, is strategically determined to improve the existing forest fund. The paper will present the current state of forests and, accordingly, what measures are planned to increase the area under forests with certain woody species.

Key words: *forests, sustainable rural development, Smederevo, forestry.*

1 The paper is the result of scientific research funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

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IRRIGATION AS A FACTOR OF ECONOMIC SUSTAINABILITY OF AGRICULTURAL PRODUCTION

Nataša Kljajić¹, Zorica Sredojević²

Abstract

The subject of research in this paper are the economic parameters of application of irrigation, as important agro-technical measure in agricultural production of the Republic of Serbia. Measures considered are based on the available data of the SORS and the records of other relevant institutions, ten-year trends of irrigated areas, sources of water intake, and more importantly ways of applying irrigation. The aim of the research is to analyze the results of the development so far, to consider the shortcomings and the possibility of improving the irrigation measure in the agricultural practice of the Republic of Serbia.

Key words: *water abstractions, areas, irrigation methods.*

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INTRODUCTION OF TALL GRASSES IN SERBIAN AGRICULTURAL PRODUCTION AND USING BIOMASS AS AN ALTERNATIVE FUEL

Nenad Đurić¹, Milena Mladenović Glamočlija², Milorad Đokić³, Marija Spasić⁴, Đorđe Glamočlija⁵

Abstract

*This research involved four perennial species belonging to the family of grasses (fam. Poaceae) characterized by intensive annual vegetative biomass growth and stalk height of above two meters. These are rush wheatgrass (*Thinopyrum ponticum*), switch grass (*Panicum virgatum*), elephant grass (*Arundo donax*) and miscanthus (*Miscanthus × giganteus*). These species originate from a large geographical area and are well adapted to various agro-ecological conditions. They are suitable for growing on soils with low natural fertility, on which most cultivated plants fail. The produced biomass (fresh or dry) is used to obtain gaseous, liquid and solid biofuels. Owing to their high tolerance to soil conditions, they are increasingly used for phytoremediation of devastated surfaces in the process of recultivation. During the vegetation season, these species incorporate significant quantities of carbon dioxide and other gases from the atmosphere. Production technology for these plants is simple and can be implemented using standard agricultural mechanization. Highest investments are required in the first year, when crops are established, with production costs significantly dropping in subsequent years. According to data from our own investigations, as well as results of other authors, costs for establishing crops amount to 4,000-4,500 EUR/ha, depending on the species. Biomass yields in the year of establishing are relatively low and do not cover production costs, but from the second or third year, high yields that*

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justify the investment in growing these energy crops are realized. Depending on the species, as well as the maintaining of crops, established plants can be used for up to twenty years, which in the end fully justifies growing tall grasses for producing biofuels, but also for phytoremediation of devastated soils.

Key words: *tall grasses, agricultural production, biomass yield, alternative fuel, production costs.*

TRADE IMBALANCE EFFECTS IN THE MEASUREMENT OF INTRA-INDUSTRY TRADE IN AGRICULTURAL PRODUCTS

*Nikola Njegovan*¹

Abstract

Since the 70s when Krugman used Dixit-Stiglitz formalization of Chamberlin's monopolistic competition model to provide a theoretical explanation of intra-industry trade (IIT), many authors were encouraged to attempt to measure it. The most famous among IIT indexes is certainly Grubel-Lloyd index (\bar{B}_i). Although fundamental problems in measuring IIT are those of categorical aggregation, many authors were also concerned about the trade imbalance problem. Namely, \bar{B}_i cannot express a maximum value when total imports and exports are not equal. Literature recognizes certain solutions to this problem (corrected \bar{B}_i , Aquino index), but none of them were imposed as definite. The aim of this paper is to offer an alternative solution to the problem of trade imbalance in the form of an index.

Key words: *intra-industry trade, agricultural trade, intra-industry trade indices.*

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DIGITALIZATION OF RURAL AREAS AND PRECISION AGRICULTURE

Petar Veselinović¹, Lela Ristić², Danijela Despotović³

Abstract

The implementation of information and communication technologies (ICTs) is gaining a significant impetus in modern environment. Thus, the ICTs have found their place in the development of agriculture and rural areas. Technological innovations, such as the application of sensors, robots, drones and business process automation, are increasingly being implemented in agricultural practice and the organization of life and work in rural communities in many countries. However, there are certain limitations in boosting the introduction of modern ICTs, despite the fact that their application in agriculture and rural economy brings numerous economic and non-economic benefits. Accordingly, the subject of research in this paper is the importance of digitalization of rural areas and development of precision agriculture. The aim of the research is to point to the advantages of this approach to the development of agriculture and rural communities, as well as the possibilities of its application in practice. The results of the research conducted in this paper indicate the multifaceted importance of introducing technological innovations in the agricultural sector and rural life, both in terms of the local population and the rural economy as a whole.

Key words: *technological innovations, rural development, precision agriculture, digitalization, smart villages.*

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**ANALYSIS OF THE MAIN INDICATORS OF FOOD CONSUMPTION,
COMPARISON BETWEEN THE PERIODS
2006-2012 AND 2013-2018**

Petruța Turek Rahoveanu ¹

Abstract

Romania is a country that over a long period of time has faced political, financial and even religious restrictions that have affected the consumption of agri-food products. With Romania's integration into the European Union in recent years, the phenomenon of liberalization of the agri-food market, successive increase in income scarring, and facilitated access to products have had a positive effect on the consumption of many products.

The analysis carried out shows a change in Romanian consumption, with the decrease owing not only to the increase in prices but to the domestic production as well. At the same time, there was significant decrease in the annual consumption of wheat and maize, sugar and sugar products, meat and beverages. Although the decrease in annual sugar consumption is not a concern, the decreases in meat consumption draws attention, particularly in the category of bovine meat, an assortment of products with a higher price and a much lower production over the last 20 years.

Technical, statistical and economic indicators were used in the work at both analytical and synthetic levels.

Key words: *food consumption, annual growth rate, coefficient of variation.*

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CONDITION FOR SUSTAINABLE DEVELOPMENT OF RURAL TOURISM IN THE AREA OF LOWER DANUBE REGION IN THE REPUBLIC OF SERBIA

Predrag Vuković¹, Slavica Arsić², Vlado Kovačević³

Abstract

Six municipalities make area of the Lower Danube Region (Veliko Gradište, Golubac, Kučevo, Majdanpek, Kladovo and Negotin). The area has three main tourist attractions: the Danube River (European Corridor VII); Djerdap National Park with Djerdap Gorge; and the Archaeological Site “Lepenski vir”. In addition to these, there are numerous other potential tourist attractions in the Lower Danube region. This is important for the development of rural tourism, since visits to these attractions could enrich the content of the tourist products that would be offered to tourists who would stay in one of the local rural tourist destinations in this area. The development of rural tourism is not evenly represented in this area. Majdanpek, Negotin and Kladovo stand out as municipalities with the most developed rural tourism. In addition to the existing ones which are already being used in touristic exploitation, the aim of the article is to point out the resources, on which rural tourism on principles of sustainability, could be developing in the entire area. Both receptive and all other resources that are important for the creation of rural tourist products will be pointed out.

Key words: *tourism, rural area, destination, accommodation.*

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WHAT ACTUALLY DRIVES AGRICULTURAL LAND MARKET IN SERBIA NORTH

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Abstract

Patterns of agricultural land control in Serbia are changing since 1989, when Act of “Land maximum” ceased. Consequently, structural changes of farms in Serbia sped up. Number of farms was decreasing, while average size increased, but not in all types of farm. Serbian agriculture production is based on two main production regions: north, plain and south, hilly region with completely different farm structures. The main goal of this paper was to research which factors, on farm level, influence agricultural land control (owned and rented) in Serbia North region, focusing on 8 basic types of farming. Three driving factors were examined on farm level using Farm accountancy data network (FADN) data: productivity, technical efficiency and profit in period 2017 to 2019. Weighing all elements on national level revealed us its positive correlation with increase in used agricultural area (UAA). The strength of association ranges from moderate to high, while technical efficiency and profit explain most of the variation in land control changes by farm types.

Key words: *land control, farm types, productivity, technical efficiency, profit.*

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PRODUCTION POTENTIALS AND EXPORTS OF THE FOOD INDUSTRY OF VOJVODINA

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Danilo Đokić⁴, Žana Jurjević⁵*

Abstract

The food industry is a relatively important sector of the Serbian industry, especially in Vojvodina. The mill, sugar, and oil industries are of the greatest importance and, to a lesser extent, the slaughter industry. For the afore mentioned sectors in Vojvodina, there are strong resource potentials in terms of the production of raw materials and significant processing capacities. This paper aims to point out the main problems of the most important branches of the food industry of Vojvodina through the analysis of production potentials and export performances. Results showed that Vojvodina's food industry is characterized by great diversity in capacity, technological level, and marketing approach. Although small enterprises are present to a certain extent, the food industry's main characteristic is oversizing in almost all segments and divergent development after the privatization that has been carried out in the past two decades.

Key words: *Vojvodina, food industry, production performance, competitiveness.*

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CONSERVATION, SUSTAINABLE USE AND INSTITUTIONAL CAPACITIES OF GENETIC RESOURCES OF CEREALS

Svetlana Roljević Nikolić¹

Abstract

Plant genetic resources which are important for food and agriculture represent only a small part of total biodiversity, but their sustainable management is crucial for maintaining the most expressive genotypes of cultivated crops made by nature itself. In accordance with the requirements of species and possibilities of countries, plant genetic material for food and agriculture is mainly conserved in two ways: in situ or in natural habitats and on farms, as well as ex situ or in gene banks. Taking into account that cereals represent the basis of the world food security, the paper examined the genetic resources of these crops i.e., their state in ex situ preservation conditions. Desk research methodology was used to collect data on the number of samples in the largest collections of cereal germplasm worldwide, with the focus on the genetic resources of wheat and maize. It is estimated that there are more than 1,750 gene banks holding approximately 7.4 million samples of different gene material of plants significant for food and agriculture worldwide. Collections of the two main cereal crops - wheat and maize - make up as much as 15% of the global ex situ conserved germplasm.

Key words: *genetic resources, cereals, gene banks, collections, samples.*

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METHODS OF IMPLEMENTATION ENVISAGED IN THE RURAL DEVELOPMENT STRATEGIES IN THE REPUBLIC OF SERBIA

Svetozar Krstić¹

Abstract

The paper analyzes the implementation of Rural Development Strategies for several typical municipalities from different regions of Serbia. The Republic of Serbia does not have a law on mandatory planning and adoption of strategic documents, due to the content and structure of strategic documents, the strategy of rural development included, and as the result of adopting the EU practice. The development and adoption of a significant development document is in itself a very large task and goal, but it is essentially a simpler part of the work in the adoption of rural development strategies. The harder part of the project is implementation, especially considering the need to articulate local needs and requirements of local participants, along with the need to coordinate the activities of a large number of participants. The starting point for the development and implementation of the Rural Development Strategy is a participatory approach, as well as the adoption and implementation of the “bottom-up” principle, with the active role of local participants.

Key words: *rural development, implementation, strategy, coordination, participants.*

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IMPLEMENTATION OF THE LEADER APPROACH IN SERBIA: EXPERIENCES AND RESULTS

Vesna Paraušić¹, Bojana Bekić Šarić²

Abstract

“Leader approach” and local public-private and civil territorial partnerships, in form of “Local action groups” aim toward the development of rural areas by using local initiatives, activities, potentials and needs (so-called „bottom up” approach) and by preparing and implementing local development strategies. This kind of approach toward the development of local rural communities has been present for a long time in rural politics and practice of most European countries. In Serbia, full legal basis to support implementation of this approach at national level has been established in 2019, and local stakeholders were not sufficiently informed with LEADER principles, especially in rural communities which were sparsely populated, poor and economically undeveloped. In the following years, one should expect the continuation of initiative support at national level, accreditation of LEADER measure into IPARD III Program, as well as larger role of local territorial partnerships in initiating development and improvement of quality of life in rural communities.

Key words: *Leader approach, LAG, rural development, Serbia.*

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STATE AND DEVELOPMENT OF ORGANIC AGRICULTURE IN SERBIA

Vesna Popović¹, Branko Mihailović²

Abstract

The paper first contains a brief overview of the role of organic agriculture in the sustainable development and the state of the sector in the world and in the EU. The following is an analysis of the organic production structure and export results in Serbia and an assessment of the organic policy and legal framework in light of their harmonization with the EU. Priority measures for improvements within the organic sector are given in the conclusion.

Key words: *sustainable development, organic agriculture, organic area, producers and markets, organic policy and legislation, Serbia.*

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IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE IN NATURAL RESOURCES MANAGEMENT IN PROTECTED AREAS

Viktor Radun¹, Mirjana Bartula²

Abstract

The enormous transformational power of AI and its radical and comprehensive impact find application in the field of natural resource management and ecosystem maintenance in protected areas. In this paper, we analyze the possibilities and challenges of the application of AI in protected areas, especially from the aspect of supporting the management of natural resources and achieving sustainability of ecosystems, which are of great importance for local socioeconomic development based on ecotourism.

Key words: *artificial intelligence, AI, ecotourism, protected areas, sustainability.*

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SERBIAN AGRICULTURAL PRODUCTION IN THE CONDITIONS OF ITS ADAPTATION TO EU REQUIREMENTS¹

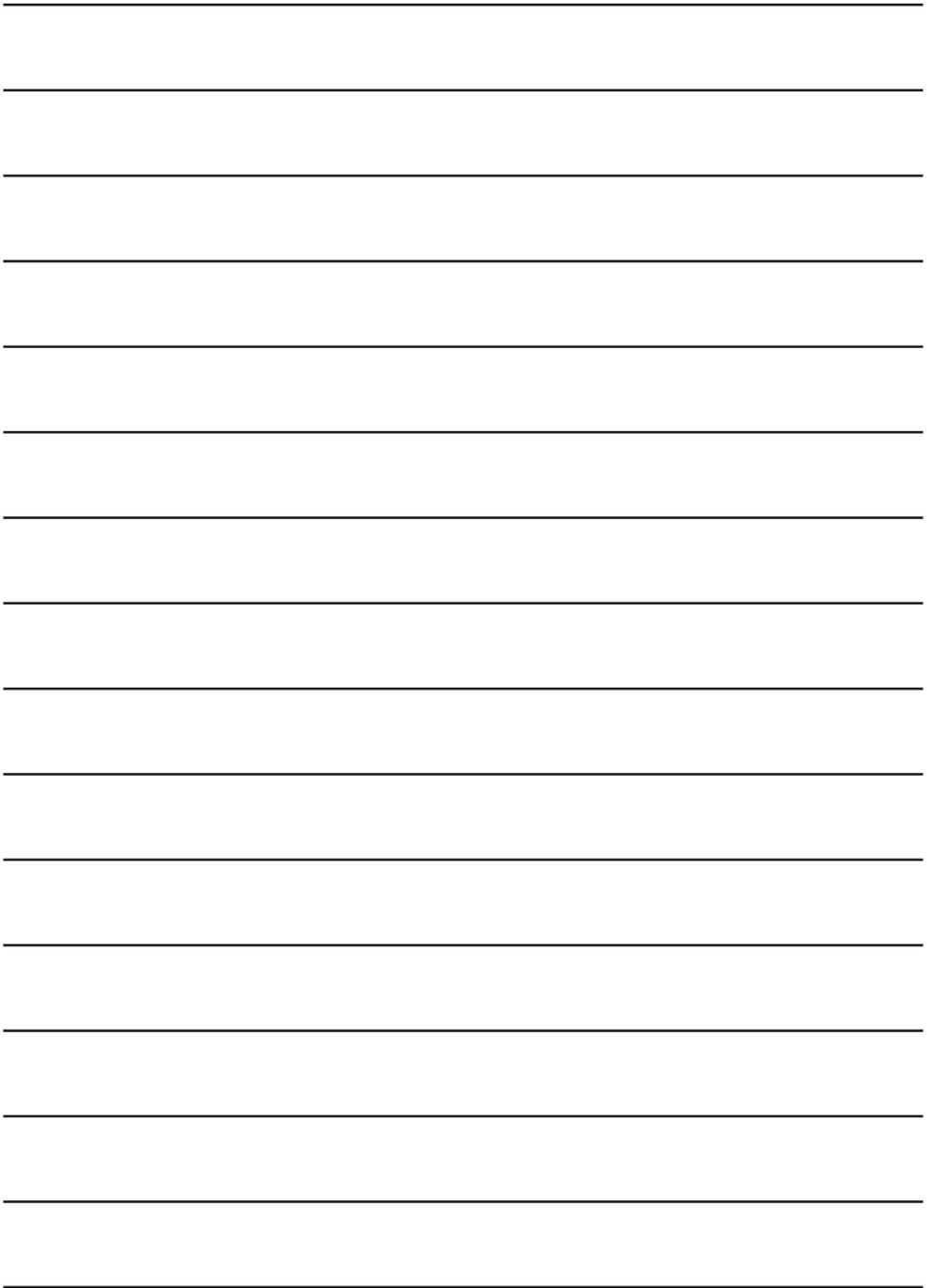
Zoran Simonović², Nikola Ćurčić³, Biljana Grujić Vučkovski⁴

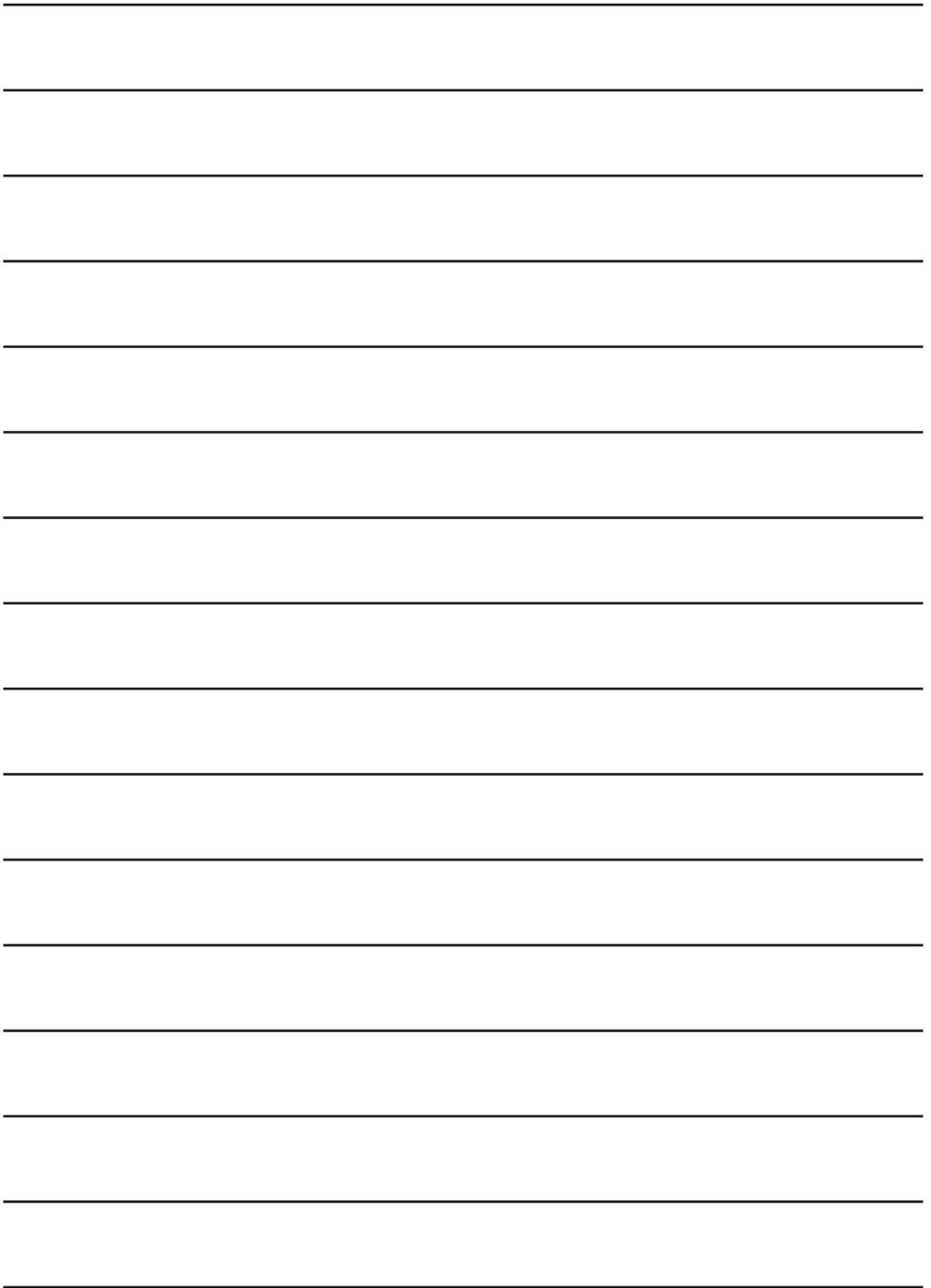
Abstract

The aim of this paper is to present the agricultural production of Serbia in the conditions of its adjustment to the requirements of the EU, and in this paper, it will be observed many times. First, Serbia's agriculture must adapt to EU standards in order to place its products on the European market and be competitive. Secondly, competitiveness in the EU market is most easily achieved and maintained when farmers act together, with their form of organization and work based on modern standards. Thirdly, the authors believe that it would be easier for our farmers to market their products if they were produced in compliance with the requirements and principles of environmentally friendly production. The production of such food is becoming more and more represented on the world market and could be an export opportunity for our farmers.

Key words: *agricultural production, competitiveness, farmers associations, organic agriculture, EU.*

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- 1 Article is a part of research financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia.
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CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

631:502.121.1(048)(0.034.2)
005.591.6:631(048)(0.034.2)
338.432(048)(0.034.2)

INTERNATIONAL scientific conference Sustainable agriculture and rural development (2020 ; Beograd)

Book of abstracts [Elektronski izvor] / International scientific conference Sustainable agriculture and rural development, [December, 17-18, 2020], Belgrade ; [organizers] Institute of Agricultural Economics ; [editors Jonel Subić, Predrag Vuković, Jean Vasile Andrei]. - Belgrade : Institute of Agricultural Economics, 2021 (Novi Sad : Mala knjiga). - 1 elektronski optički disk (CD-ROM) ; 12 cm

Tiraž 9. - Preface / editors. - Napomene i bibliografske reference uz tekst.

ISBN 978-86-6269-095-1

1. Subić, Jonel, 1964- [уредник]

а) Пољопривреда -- Научно-технолошки развој -- Апстракти б)
Пољопривреда -- Одрживи развој -- Апстракти в) Пољопривредна
производња -- Апстракти г) Рурални развој -- Апстракти

COBISS.SR-ID 31462665

