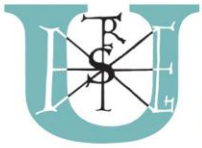

Szent István Egyetem

Georgikon Kar

62. Georgikon Napok

A klímaváltozás kihívásai a következő évtizedekben

Előadások kivonatai

Keszthely, 2020.

Köszöntő

2020 - az Európai Unió tíz évre terjedő „Európa 2020" stratégiájának záróéve, egyben a hét évig tartó költségvetési ciklus utolsó éve, egy évtized zárása és egy új évtized kezdete. A célok és elvárások erre az évtizedre egzakt módon meghatározottak voltak - foglalkoztatásra, K+F tevékenységre, éghajlatvédelemre és fenntartható energiagazdálkodásra, oktatásra, küzdelemre a szegénység és a társadalmi kirekesztés ellen. Ha visszatekintünk nemzetközi tudományos konferenciánk, a Georgikon Napok elmúlt tíz évére, rengeteg, a fenti kérdésekkel foglalkozó tudományos munka jelent meg ezekről a területekről, elősegítve ezzel a gyakorlati kérdések tudományos igényű megvitatását.

Várható volt, hogy a 2020. év rendkívüli lesz, arra azonban, ami történt, talán senki sem számított. A vírus okozta globális veszélyhelyzet lokális hatásaival tanultunk meg együtt élni. Az online térbe kerülő oktatás, a mindennapok veszélyt csökkentő intézkedései átalakították életünket. A Georgikon Napokat első alkalommal nem személyes részvétellel rendezzük meg. Emiatt a konferenciák egyik legfontosabb mozgatórugója, a személyes kapcsolatok ápolása, a tudományos közéletben új kapcsolatok létrehozása, az oldott hangulatú esti fogadások idén elmaradnak. Ez is egy változás, ezt is el kell fogadnunk, ugyanakkor vannak hosszabb távú változások is, amik életünket befolyásolják. A közelmúltban bekövetkezett intézményi átalakulások is új impulzusokat hoztak a Georgikon életébe. Voltak sajnos veszteségeink. A tavalyi Georgikon Napok után tudtuk meg, hogy tudományos konferenciánk korábbi szervező bizottsági elnöke, Palkovics Miklós professzor úr elhunyt, konferenciánk plenáris előadásában megemlékezünk életművéről.

„Vive Memor Nostri Rigidi Servator Honesti" – úgy élj, emlékezz, hogy a becsületünk őrzője vagy – szól a Georgikon jelmondata. A Georgikon Napok 1958 óta íródó története ebben az évben sem szakad meg, ezzel is adózunk az alapítóink, valamit a konferenciát kezdeményező és szervező korábbi munkatársaink emléke előtt. A „Georgikon a' készűlő Ifjakra nézve egy jóltevő Intézet, a' Földes Uraságokra nézve pedig egy oltsó, és megbetsülhetetlen Vetemény-kert" – írta Nagyáthy János jó két évszázaddal ezelőtt a Magyar Gazdatiszt című munkájában. A lényeg azóta sem változott, nem kívánhatunk mást: maradjon is így.

Palkovics Miklós a jubileumi, ötvenedik rendezvény kötetében így foglalta össze konferenciánk célkitűzését: *„A Georgikon Napok akkor tölti be funkcióját, ha kiadványaiban megjelent értekezésekről az azt tanulmányozók elmondják egyetértő, vagy eltérő véleményüket, azokat a szakirodalmi hivatkozásokban kifejtik"*. Minden résztvevőt erre bíztatunk, ezzel a gondolattal kívánunk hasznos tanácskozást, és várjuk Önöket 2021-ben is, akkor már remélhetőleg személyesen!

Köszönjük a szervezésben és lebonyolításban szerepet vállaló munkatársaink fáradozásait, külön köszönet illeti a regisztrált és az előadást tartó résztvevőinket!

Dr. Dublecz Károly
egyetemi tanár, dékán

Dr. Anda Angéla
egyetemi tanár
a Tudományos Bizottság elnöke

Dr. Lukács Gábor
egyetemi docens
a Szervező Bizottság elnöke

A 62. Georgikon Napok témája

A klímaváltozás kihívásai a következő évtizedekben

Fővédnök: Dr. Botos Barbara,
klímapolitikáért felelős helyettes államtitkár, ITM

A klímaváltozás napjaink egyik megkerülhetetlen témaköre. Az Európai Unió élen jár a klímavédelem terén: az egyes tagországok, így Magyarország is elérendő célokat fogalmaztak meg a klímaváltozás sebességének csökkentése érdekében.

Alapvető kérdés, hogy a gazdaság egyes szereplői hogyan tudnak hozzájárulni a klímavédelemhez, hogy tudnak ebből a „csatából" versenyképességüket emelve győztesen kikerülni.

A klímapolitika valamint az energiatermelés és -felhasználás összetartoznak. A mezőgazdaság, az energia és az élelem/takarmány előállítás összhangjának megteremtésével fontos szerepet játszhat a klímavédelemben, ahol az energiaellátás biztonságának megteremtése és ezzel együtt az energiatárolás széleskörű alkalmazása is egyre inkább előtérbe kerül.

Dr. Anda Angéla
A Tudományos Bizottság elnöke

Dr. Dublecz Károly
dékán

Dr. Gyuricza Csaba
rektor

Köszönet támogatóinknak!

A konferencia előkészítését végző bizottságok

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Németh Szabolcs
Dr. Lukács Gábor (elnök)

Zoltán ALFÖLDI

New Prospects for Environmental Education in the 21st century

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The incredibly fast changes in many aspects in the lifestyles and use of natural resources without any historical precedents highlight the special importance of bioethics and environmental education, serving the proper and efficient use of scientific and technological advancements. In this study here we present those new and already well-known methods of environmental education which has already proved to be efficient, and also those of having promising prospects for the future. We present those data we have obtained in the Bábolna Farm Festival. We have collected information among the participants in this event, using a questionary form developed for this purpose. We will discuss about the requirements of the methods which are needed to have a really efficient method of environmental education. We will also compare the most relevant methods used in the Hungarian and international practice, such as forest schools and varoius programs of this kind. Suggestions and future directions will also be discussed.

Sándor ANTAL[1] - Judit VINCZE[2]

Possibilities of biomass - fired village heating in rural development

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In Hungary, in addition to industry, households are the largest energy consumers, spending a fifth of family income on housing energy needs. In addition, one of the leading sectors of our national economy, the energy sector, needs to import raw materials, increasing domestic import dependence and vulnerability, despite studies suggesting that our biomass potential could cover a significant part of our energy needs. In connection with the use of biomass for heating purposes, we must also take into account the achievement of Hungary's carbon neutrality by 2050 in connection with climate protection. However, in order to significantly reduce emissions of heating gases in the near future and to increase the competitiveness of our sectors of the economy, more efficient technologies, processes and the development of innovative economic models will be needed.

In parallel, the under-utilization of rural resources in the field of energy production can be observed both in Europe and in Hungary. In the near future, the selection of appropriate energy sources will pose difficult questions for national societies. At the regional level, the wider involvement of agriculture in energy production could be an appropriate answer to these questions. Adding to this that the decentralization of energy production will improve regional economic performance, an important task will / may be to significantly increase the number of local heating plants in the future. In connection with decentralization, the advantage of a village heating plant is that, in addition to reducing our energy dependence by using domestic raw materials, a central incinerator also has more favorable results in terms of environmental maintenance. There is also another opportunity in the field of job creation, which represents a significant step forward in the development opportunities of smaller settlements.

In connection with the above, the focus of our research was on the investment and operation of village heating plants. Within the framework of the investment study, the main emphasis was placed on rural development aspects. We summarized our results in the development of the problem tree and the development toolkit.

Zsuzsanna BACSI

Popularity of camping tourism in various European countries of different cultural traits

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Nature-based tourism is particularly concerned with environmental sustainability, as natural resources are the main appeal of this form of tourism. Camping tourism is generally associated with a strong attachment to nature, and campers represent a significant segment of domestic tourists, being responsible for about 10% of total domestic tourist nights in the EU.

However, preference for camping holidays differs greatly among various countries. The present research analyses these differences in the light of national cultural characteristics. Multiple regression analysis was carried out for 28 European countries for 2012-2018, applying Hofstede's cultural dimension values to describe national cultures, and the percentage share of camping tourist nights within total domestic tourist nights to find out the relationship between national cultural traits and preference for camping holidays. Findings show that countries with larger power distance, greater individuality and stronger long-term orientation are more inclined to spend their domestic holidays in campsites, and larger per capita GPD values are also associated with higher proportions of campsite tourist nights. This latter fact indicates that camping holidays are no longer associated with the image of „cheap holidays for the poor".

Gábor BAKOS[1] - Norbert BOROS[2] - Szilvia SZÖGI[3] - Miklós SZABARI[4]

The experience of the double - ovsynch treatment in a Holstein dairy farm

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In dairy industry, the successful husbandry is the results of the appropriate reproductive indexes, reproductive data and appropriate reproduction management. Recently, the improvement and the efficiency of the first insemination got significant attention. Therefore, we need to also consider to improve the management of the fresh cows and to apply specific reproductive processes and methods. The application of the double-ovsynch method can improve the conception rate of the first insemination in the appropriate settings. At the end of the 7-vaccination program, there are certain changes in the hormonal levels of the animals: the ratio of the animals with an elevated progesterone level will increase. These hormonal changes can have positive effect on the result of the first insemination in the appropriate settings. In summary, we can conclude based on our observation that among the treated animals, there were less re-heated animal after the insemination and more animal will be diagnosed as empty on the pregnancy examination. This program should only be applied in certain farms with appropriate professional background and equipment.

This observation was performed in a Holstein dairy farm. We analyzed the reproductive parameters of 3200 first insemination during 2 years retrospectively.

Zoltán BAKUCS[1] - Zsófia BENEDEK[2] - Imre FERTŐ[3] - Viktória SZENTE[4]

What is the key factor behind the success of Hungarian farmers' markets? A spatial study

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Alternative food networks have emerged in response to concerns about the various negative impacts of the conventional, globalized food system. Especially farmer's markets (FMs) play an increasingly important role. Geographic concentration of alternative food initiatives has been observed and characterized in certain regions of Western countries including Canada, the US, the UK, etc., but spatial distribution is still unexplored elsewhere, such as in Central European countries. It is continuously debated whether flourishing alternative food networks (e.g. succesful FMs) are drivers or consequences of regional development. The impact of regional factors and government support on the presence and location of FMs in Hungary was analysed in this study.

Data were drawn from several public sources and referred to the period 2013-2018 at the level of the 174 LAU1 regions. Spatial autoregressive models and treatment effect analysis were applied.

Estimations suggest that population density and average tax income of the regions were positively associated with the presence of FMs along with the age distribution of local residents, and the number of farms and related factor endowments. On the other hand, density of retail shops, restaurants and hotel industry had no influence on the success of FMs. Rural development funds had only small positive or negligible effect. The results also highlight the importance of distinguishing between individual and corporate farms dominated regions. Our results are robust to alternative definitions of rural development support and alternative matching methods.

To conclude, the social-economic background of a region plays an important role in the success of FMs, whilst the impacts of government support and service sectors density seem to be negligible.

Bence BALASSA[1] - Zsuzsanna BANÁSZ[2]

The spread of diesel cars in Hungary

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The theoretical part of the study summarizes the literature on the advantages and disadvantages of diesel and petrol cars. The subject of practical research is two indicators, namely the number of cars and the number of diesel cars. From a territorial point of view, Hungary and a county seat (Veszprém) are examined. The paper aims to answer the following research questions (Q). (Q1) Can the time series of the two examined indicators be described with similar trends at the national level and in Veszprém? That is, what is the type (linear or exponential) and direction (increasing or decreasing) of the trends? (Q2) Do the indicators significantly correlate with each other? Annual (2001-2018) data of the Hungarian Central Statistical Office were employed. Quantitative methods (time series analyses and relationship testing) are applied as research methods. Based on the results, the following theses (T) can be formulated. (T1) The trends of the Hungarian and Veszprém time series are very similar. The linear and exponential trends fit similarly well into the time series of the two variables examined, both nationally and in Veszprém. Each of these trends is increasing. (T2) There are positive and very strong correlations between the examined indicators.

BALI Lóránt

A horvát-magyar határon átnyúló kapcsolatok néhány környezetpolitikai aspektusa

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A horvát-magyar határmente egy sajátos térség. A 355 kilométer hosszú határszakasz jelentős része a Dráva és a Mura révén folyami határ. Az államszocialista érában változó mértékben, de zárt zónaként funkcionált, a természeti értékek háborítatlanok maradtak. Az EU – csatlakozásunk utáni határon átnyúló fejlesztéseket szolgáló programok sajátosan álltak hozzá a térség reintegrálásához. A tanulmány célja, hogy térség fejlesztését szolgáló IPA programok környezetpolitikai aspektusait elemezze.

Dániel BALLA[1] - Marianna ZICHAR[2] - Róbert TÓTH[3] - Emőke KISS[4] - Gergő KARANCSI[5] - Vilmos LÁZÁR[5] - Imre BARANYI[5] - Tamás MESTER[6]

Visualization of Water Quality Index using Keyhole Markup Language

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Because of the increased demand for information of today's society, the scientific community published their results on the web during the last two decades adapting to the national and international requirements. Due to the rapid expansion of the Internet and the development of web-based or regional spatial information systems, the access to spatial soil data of various themes and quality become significantly easier. As a result of the data harmonization of the national and international geodatabases, these robust systems are available for everyone making it accessible the knowledge stored in databases.

Detection, mapping and evaluation of water quality is important for resource planning, monitoring and environmental management using GIS. Since the development of the first water quality index we could describe the water quality status using numerous parameters but large amounts of data make assessment and comparison significantly difficult. In the present study, the effects of the sewage network construction on ground water quality are evaluated using Water Quality Index (WQI). For this geovisualiation we developed a free available interactive webmap which was used to quantify the groundwater quality status of the investigated wells. It also can be used to publish the uploaded spatial data to a webmap.

This work was supported by the construction EFOP-3.6.3-VEKOP-16-2017-00002. The project was supported by the European Union, co-financed by the European Social Fund.

Jeremiás Máté BALOGH

Recent trends in business sustainability: the case of Hungary

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Since the ratification of the Paris agreements, business sustainability became a crucial factor for companies' long term's strategy and competitiveness. In the past years, Hungary has made significant progress in decoupling its output growth from high environmental pressures, chiefly due to implementing requirements of EU directives. Furthermore, Hungary has accelerated the transition towards a low-carbon, greener economy, particularly by investing in residential energy efficiency, waste management and better mainstreaming of biodiversity protection into sectoral economic policies. Hungary has already started to participate in the works to mitigate the effects of climate change via reducing GHG emission and fulfil Sustainable Development Goals (SDGs).

Analysing sustainability of Hungary are already widely discussed by the studies of the EU, OECD, World Bank and Hungarian National Statistical Office. Literature indicates that developing an innovative and sustainable economy and monitoring its progress is a crucial for the country in line with the European Union' 2020 and 2030 and 2050 emission targets.

Some initiatives already called the attention of the business sector for immediate action in the field of sustainability and achieving of SDGs. The personal commitment of the Hungarian CEOs is an essential incentive to incorporate sustainability into business operation sustainability. Sustainability-related actions of companies are usually represented in Sustainable Development or CSR strategies, Code of Ethics, and in sustainability targets and programs as well. By contrast, these programs are often only a part of the company's PR strategy attracting more clients. Besides, the results of these programs are usually modest and mainly isolated. At the company level, a growing commitment to sustainability in the Hungarian business sector is more accepted among large companies. Thus the SME sector strongly needs to be improved in the field of knowledge and commitment to sustainability.

Bianka BARTL[1] - Gábor SOÓS[2]

Analysis of the sustainable agriculture and environmental management of the Visegrád Group

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The most dynamicly developing group of countries in the European Union is the V4 / Visegrad Group/.

Taking into account the economic and political interests the act of cooperating is quite important. The advocacy of common benefits gives significant advantage to the V4 member countries in the European Union. The group four member countries gain a significant advantage through the advocacy of their common benefits in the European Union. They made major steps in relation to agriculture and innovative measures were also introduced to obtain better agricultural practices. The chambers of agriculture of the V4 have their meetings several times annually to coordinate their needs and have a strong ambition to have a joint development. Environmental protection, promotion, simplification and improved efficiency of sustainable agriculture are the greatest challenge facing our life nowadays.

The main aim of this present research is to review publications, articles and studies that have bee published recently in order to have a global perception of the topic and get an overview of the steps that have been made so far.

Comparing the main aims of the environmental management and the progress which were published we can come to important conclusions in connection with the development of activities of the V4 and we can underpin our research and draw up our analysis.

BÁNHEGYI Gabriella

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Azokban a vidéki térségekben, ahol a mezőgazdaság napjainkban is a jövedelem elsődleges forrása, különösen, ha ezt a mezőgazdaságot az alacsony kapacitású kisgazdaságok túlsúlya jellemzi, a jövedelem-kiegészítés, az új jövedelemforrások megtalálása alapvető jelentőségű lehet a vidéki lakosság életszínvonalának fenntartásában, javításában. Az EU kapcsolódó politikái hangsúlyozzák a fejlődés multifunkcionális felfogását, mely révén a vidéki térségek környezeti, társadalmi és gazdasági fenntarthatósága megvalósulhat. Lehet-e vajon a falusi turizmus, falusi vendéglátás a diverzifikáció egyik útja? A tanulmány vizsgálja az erdélyi vidéki térségek helyzetét és a falusi-, illetve agroturizmussal kapcsolatos növekvő érdeklődés mögött meghúzódó okokat.

Krisztina BÁNÓCZKI[1] - Ibolya REVÁKNÉ MARKÓCZI[2] - Péter CSORBA[3]

Investigation of the conceptual knowledge of primary school students related to climate change using the word association method

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This study presents the results of a research in knowledge structure analysis. The word association method was applied in the research in order to explore the conceptual structure of students. Word association is a knowledge structure analysis method using key-concepts as stimulus words in relation to a given topic in order to see what other words are associated with them by the students within a given time period. In this study the stimulus words included climate change, greenhouse effect, global warming, intemperate weather and water shortage. The word association survey was carried out in Hajdúböszörmény (Hungary) in November- 2019 investigating the conceptual structure of primary school students in relation to climate change involving students at grade 5 and 8. Students were required to associate 5 words to each of the stimulus words within a given time. Based on the obtained data, relationships among the stimulus words were studied, Garskof-Houston relatedness coefficients were calculated, associations were synthetized and their relative frequency was determined. Correlations were graphically illustrated using the software yEd Graph Editor creating conceptual maps depicting not only the connection between stimulus words but also between stimulus words and associations and even the strength of the above relationships as well.

BIERMANN Margit

A Balaton térsége lesz a magyar Florida?

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Pannon Egyetem, mesteroktató

Az Egyesült Államokban sok nyugdíjas ember költözik Floridába, hogy ott éljen isős korában. Magyarországon az utóbbi évkben a Balaton térségében nőtt a 60 éven felüli népesség száma és aránya. Ez nem csak az eredetileg is itt élők idősödésével magyarázható, hanem a térségbe települők között is egyre nagyobb létszámot képvisel a 60 év feletti korosztály.

A kutatás a következő kérdésekre keresi a választ: az egyes településeknél hogyan alakult az állandó népesség életkor szerinti megoszlása; mi jellemzi a térségbe irányuló vándorlást; melyek az idősek számára vonzó települések; illetve ezek fel vannak-e készülve a növekvő létszámú időskorú személy ellátására.

A kutatás során alkalmazott módszerek: dokumentumok és statisztikai adatok elemzése, interjúk készítése a Balaton térségébe települő időskorúakkal és az érintett települések vezetőivel. A kapott eredmények elemzését követően következtetések levonása és javaslatok megfogalmazása az érintettek számára.

BORBÉLY Csaba[1] - GŐBEL Rebeka[2] - KŐMÜVES Zsolt[3]

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Aktuális létünk a Földön számos ellentmondást hordoz magában, amelyek közül egyik az élelmiszerhez való viszonyunk. Amíg a világ jelentős részén éheznek az emberek, addig a gazdagabb országokban az elhízás, sok esetben a kóros elhízás jelent társadalmi szintű problémát, amely mellett egyre hangsúlyosabban megjelenik az élelmiszerpazarlás drasztikus mértéke. A FAO adatai szerint a megtermelt élelmiszer harmada nem jut el a fogyasztóhoz, a Word Resources Institute számításai szerint, pedig ha negyedével csökkentenénk a veszteségeket, az 795 millió ember táplálásásra elegendő élelmiszert jelentene. Ez az ellentmondásos helyzet ad aktualitást a témának, amely csak nőni fog, hiszen a Föld lakossága évente mintegy 80 millió fővel növekszik, a táplálásunkra fordítható erőforrásaink pedig végesek. Az ellátási láncban keletkező élelmiszerveszteség egészéből kutatásomban a háztartásokra fókuszáltunk. A téma nehezen kutatható területnek számít, mert érdemi eredményt ez idáig csak naplózással lehetett elérni, de módszernek számos korlátja van, amely torzíthatja az eredményt. Kutatásunkban 20 kaposvári háztartásban 14 nap hosszan mérték az élelmiszerhulladék mennyiségét. Módszertan tekintetében egy a Nemzeti Élelmiszerbiztonsági Hivatal (NÉBIH) által lefolytatott 2016-os felmérés eljárását követtük. A naplókat Excelben rögzítettük és számítottuk ki a hulladék mértékét két kategóriában. A felmérésben keletkező élelmiszerhulladékot két kategóriába sorolhatták a kitöltők: „nem elkerülhető élelmiszerhulladék" és „elkerülhető élelmiszerhulladék" közül választhattak, amely ebben az esetben csak részben egyezett meg a NÉBIH projekt módszerével. A nem elkerülhető élelmiszerhulladékba azokat az élelmiszer részeket értjük, amelyet közízlés alapvetően ma nem tekint ehető anyagoknak (pl. tojáshéj, csont, burgonya héj). Az elkerülhető élelmiszerhulladékok ismérve, hogy annak ellenére nem kerülnek fogyasztásra, hogy azokkal eredetileg nem volt semmilyen probléma. Adott publikációban a kutatás alaperedményeit és egy hipotézist tekintettük át.

H1: Magyarországon a háztartásokban keletkező élelmiszerhulladék mennyisége nem haladja meg az uniós átlagot. Egy több országon átívelő kutatás eredményét (92 kg/fő/év) összevetve a kutatási eredményemmel (62,5 kg/fő/év) alapján megállapíthattam, hogy az első hipotézisem igazolást nyert, vagyis a hazai háztartások élelmiszerhulladék termelése alacsonyabb, mint az uniós átlag.

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Importance of time in dairy farms using robotic milking

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Currently, the use of precision technologies has become increasingly important in animal husbandry, especially in dairy cattle farming. In systems that using robotic milking and other smart farming technologies, a lot of "real-time" data and information about the herd is available which can be used to evaluate the system and then its efficiency can be significantly improved. In dairy farms, time (such as time to first calving, time between two calvings, time to weaning, time to first insemination after calving, time to the end of lactation, etc.) is extremely important. It can determine the efficiency of a production system and the production level of the herd, moreover it may have a great influence on economic indicators too. Furthermore, the daily tasks must take place at a specific time and often in a fixed order. For this reason, it is essential to examine certain indicators, e.g. time of milking, time between milkings, time and frequency of feeding, time spent resting or lying, and time spent eating. In a dairy farm using a robotic milking, these time-related parameters' role is perhaps even more significant. Any deviation from the optimal or predetermined values might have a serious impact on the operational efficiency of the entire system.

The studies were performed in a free cow traffic dairy farm using Lely milking robots. During the evaluation, we analyzed the production parameters of 96 first-lactation Holstein-Friesian cows in the post-habituation period.

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Estimation of multinomial logit models through the use of R: Apollo package - example in transport economics

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The research aimed to present a potential model (multinomial logit) of a preference evaluation procedure (discrete choice experiment) through the use of R: Apollo package, with particular attention to the estimation process and the interpretation of the results.

To accomplish that mentioned above, we have processed an accessible to all example that examines preferences for different travel alternatives. During the presentation of the estimation process, we discussed the types of parameters and the structure of the utility functions, while the obtained results were divided into three parts (basic data of the model, parameter estimates, overview of choices).

The results of our research, on the one hand, could make investigations easier for potential users who want to use the presented specification (through the use of the R: Apollo package) in the later, and on the other hand, they may provide excellent guidance for the application of an advanced methodology in the field of transport economics.

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Examining consumer preferences for a traditional meat product

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The research aimed to assess domestic consumer preferences (in relation to the Northern Great Plain region of Hungary) in the context of a traditional food product (mangalica sausage) through the use of discrete choice experiment method.

Based on a detailed literature review and focus group interviews, we determined the product characteristics considered most important by consumers and their levels, from which we compiled the election situations included in the questionnaire. The final questionnaire included 8 decision situations, each containing 3 product alternatives. The sample consists of 477 persons, which is adjusted to the regional distribution according three aspects (gender, age, place of residence).

The main conclusions from the estimates are that, the existence of the label of origin positively influences consumer utility; purchasing from the farmer is preferable to both the butcher and the hyper-/supermarket. However, in terms of meat content, dubious results were obtained. With the two classes of the latent class and the multinomial logit models, the utility of the product increases with the increase in meat content, while the results of a latent class group and the random parameter logit model indicate that the 75% meat content product is more preferred than product with 100% meat content.

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Comparative evaluation of fractionated green biomass from different alfalfa (Medicago sativa L.) varieties

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The interest in isolating the protein and other valuable compounds from green biomass has returned to the spotlight especially in the changing world with an exponential population increase and the tremendous need for food and feed. From this approach alfalfa has high potential in our climate.

The basic steps of wet fractionation is the following: separation of green biomass into two fractions by a mechanical press machine resulting green juice and a fiber-rich fractions. Next step is the thermal coagulation (80+/-3 °C) of green juice. The coagulated Leaf Protein Concentrate (LPC) can be separated from brown-colored liquid fraction using cloth filtration.

In the present study four alfalfa varieties (Tápió szelei, Olimpia, Hunor and Expressz) were compared considering the green protein and other compounds refining. Our aim was to evaluate i) leaf:stem ratio ii) the mass of green biomass harvested in each plot iii) ratio of fractions after separating from green biomass. We divided a 72 m2 field into 6 m2 plot, all four varieties were randomly planted in 3 plots each. At harvest we selected 20 random specimen of alfalfa of each variety, we separated the leaves from the stem and we evaluated the leaf:stem ratio by measuring the mass of the fractions. After harvesting we evaluated the total mass of the biomass as well. As a result of the first harvest the total green biomass was higher (8-8,5 kg) than in case of the second scythe (7-7,5 kg). There was no significant difference in leaf:stem ratio in case of varieties and harvests either. The varying values of standard deviation of green biomass is probably due to the heterogenity of soil compositon of the plots. Green juice and fiber-rich fraction represented 60-65% and 27-30% of the whole biomass respectively. In total, 39-44% of brown juice and 12-17% of LPC was filtered out from the green pulp.

The research was financed by the „Complex Rural Economic and Sustainable Development, Elaboration of its Service Networks in the Carpathian Basin (Project ID: EFOP-3.6.2-16-2017-00001, Hungary)" project.

CSEH Judit

A pályaorientáció korszerű szemlélete és gyakorlati aspektusai

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A fiatalok munkaerő-piacra való sikeres belépésének és helytállásának alapvető feltétele az átgondolt pályadöntés. Ahhoz, hogy a pályaválasztás valóban megalapozott legyen, szükség van az egyén személyiségjellemzőinek feltárására, a megcélzott pálya és az ahhoz kapcsolódó képzési feltételek biztos ismeretére és közel sem utolsó sorban a munkaerő-piaci elvárások, igények figyelembevételére. De ugyanezen információk segíthetnek egy felnőttkori álláskeresés vagy pályadöntés esetében is. Akár pályamódosítás vagy pályakorrekció előtt állunk, történjen ez belső késztetésből vagy külső feltételrendszerből adódóan, egy komplex feltételrendszer átlátását és az információk integrálását igénylő kérdésről van szó, amely eléréséhez egy tudatos és folyamatos feltáró munkára van szükség. Ez a folyamat a pályaorientáció, amelynek célja egyrészt a konkrét iskolaválasztás, pályaválasztás elősegítése, valamint a személyiség tartós beillesztése a munka világába. Másrészt azon felnőttkori élethelyzetek segítése, amikor a szakmai életútunkkal kapcsolatban döntés/változtatás előtt állunk, valamilyen nehézséget, elakadást élünk meg.

Az előadásban sor kerül a pályaorientáció élethosszig tartó jellegének tisztázására, az ehhez szükséges korszerű szemlélet bemutatására és az alapelvek kihangsúlyozására. Fontosnak tartjuk indokolni a pályaorientáció fontosságát egyéni, szervezeti, ágazati és makrogazdasági szinten egyaránt. Kitérünk ezentúl a szakmailag támogatható agrár-orientációval szembeni elvárásokra, valamint specifikumokra.

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Technological development of slaughterhouse by-product processing for petfood feed flours

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The KOMETA'99 Company's slaughterhouse in Kaposvar produces 8726 tons by-product per year. We are searching for the most appropriat technologies to process these by-products like meat trimmings, internal organs, separated bones, pig bristle, semi-finnished and finnished meat products, which do not used for human consumptation and cannot be sold. The aim of processing these slaughterhouse by-products for meat and bone flour, pig bristles flour, and industrial fat for petfood manufacturing. The most important characteristics of these petfood raw materials the adequat safety and excellent quality. During our industrial research we determined the most optimal parameters of the treatment and the best technologies for the processing. The first step of the project was, that we known the requirements according to the European law and the customers expectations and the possibilities for product development of the final products. The second step of this project was the laboratory experiments. During this experiments we made modelling experiments to find the most effective method for using in practice in the experimental development. The third step was the choosing the most suitable methods and the most optimal parameters for the processing to produce the most safety final products with the best possible quality and the most optimal characteristic. These by-product processing are very different tasks, that depends on the type of by-product to be processed. The requirements of the processing are very different in all the slaughterhouse by-products, however the common goals are the safety and quality of the final product. The feed flours can be sold at good price, if their safety are adequate and their quality are excellent. The most important parameters of this materials the digestible protein content and adequate microbiological, toxicological and oxidative status in order for the final product to be nutritious and healthy to ensure for the animals a healthy and long life.

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Soil aggregate stability and its dependance on some soil chemical parameters

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Aggregate stability, as an indicator of the extent of the resistance against outer destructive forces, one of the most important soil physical parameters related to soil fertility and degradation. Aggregate stability of soils also has a considerable effect on transport processes proceeded in soils. Decrease of stability could raise the decrease of infiltration, increase of the surface runoff and erosion, after all the decrease of soil fertility. Generally physical forces effect on aggregate stability (e.g. the mechanical forces of rainfall, wind and runoff water, or the structure destructive processes caused by different tillage tools (instruments, methods) and machines), but the rate of this parameter depends on different chemical binding agents and microbial activity.

For describing and evaluating the stability of soil aggregates several indicator were developed. One of these is the ratio of water resistant soil aggregates (Water-stable aggregates, WSA). In our studies this indicator was determined. The measurements were carried out by the use of an Eijkelkamp WSA device. Soil samples were taken from two long-term field experiments of the Georgikon Faculty. In our experiments, the effect of mineral fertilization, manure and straw incorporation, as well as soil tillage was investigated. During our experiments, several soil chemical parameters (e.g. pH, lime content etc.) were measured.

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Environmental utility of Horticulture and Rural Development Faculty's garden

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The value of ornamental plants can be measured not only in their decorativeness or recreational effect. Other parameters can also be quantified, which nowadays play a greater role than aesthetics. To confirm this statement, we executed a dendrological survey of our workplace. The examined green area was created in the 1970s and one of the sites of the John von Neumann University in Kecskemét. The oldest individuals of the stock, which are mainly used for educational purposes, are therefore already 40-45 years old. At the same time, this plant collection serves not only a research purpose, but is also important participant in the green infrastructure of the Great Plain country seat. Dense – in many cases multi-level – vegetation has significant O2 producing, CO2 absorbing, vaporizing and dust remaining ability. With these ecological services, it contributes to a more livable environment. The number of woody ornamentals on the examined nearly 2.5-hectare area (more than 40 % of this covered or includes a building) is more than 600. The climate improvement parameters of this „green value" are reported in our present study. We would like to confirm the significance of these garden with our results.

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Effect of weather factors on AI sperm usage of a high production dairy farm

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The effects of global warming has been one of the major questions of the scientific world in the last few decades. While its effect on crop production is well known and widely researched subject, in the case of animal husbandry the primarily emerging topic is its contribution to climate change. However it is important to consider that the process of climate change poses many challenges for this sector of agriculture too. Environmental factors influences body functions of dairy cows on many ways and thus their production. Their body tries to maintain homeostasis, but under extreme environmental conditions this consumes a significant amount of energy.

In the dairy industry maintaining good reproduction management is a key factor of continuous production. High temperature has a negative effect not just on production but on reproducion too. Due the the low number of pregnancies there are fewer calvings, which later can cause a decrease in production. One of the most important groups to be inseminated in the herd is heifers, for them at the first few artificial insemination we use sexed sperm. Nevertheless this technology has a higher cost and lower sperm fertility it provides nearly 90% possibility for a heifer calf to be born. This means we need a recipient animal with high fertility for successful use. However heat stress causes a decrease in fertility, not just in cows but in heifers too, which means we need more sperm doses to get animals pregnant. As a result, the cost of reproduction continues to increase. Thus, the economics of using sexed sperm in the warmer periods of the year can be questionable.

Using the data of a dairy farm with 1000 milking cows and the data of a meteorological station, our paper examines the effect of weather conditions on reproduction in a three year period. The aim of the research was to investigate the effects of months and seasons on fertility of the herd. With particular attention to the use of the sexed sperm in heifers.

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Investigation of Pinus mugo and Picea abies rotation along a height gradient

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The global temperature increase in high mountain areas is higher than average, which can significantly affect the physiognomy of the vegetation, can change the dominant species of different alpine zones or lead to the shift of vegetation belts.

During our research, we focused on how the state of health of the dominant conifers in montane belt and subalpine belt regions of Central Europe's mountainous areas changes along an elevation transect. Our experiments were carried out in the Hochwechsel Mountains in Austria of the Eastern Alps between 800 and 1700 m, dominated by Picea abies in montane belt and supremontane belt, and dwarf pine (Pinus mugo) in the subalpine belt. Measurements were made using the ArborSonic FAKOPP 3D acoustic tomography, this is able to detect the size and location of decayed or hollow regions in the trunk non-destructively.

It works based on sound velocity measurements between several sensors around the trunk. Our results showed that the health status of Picea abies is worse in the lower part of the montane belt and in the upper part of the super montane belt. The extent of the decay of the species slightly decreases from the ground level. In case of Pinus mugo, the degree of decay was the lowest in the upper limit of the subalpin belt, which predicts the future expansion of species to the higher alpine zone.

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Comparison of different reference databases (Greengenes, Silva and RDP) used to taxonomic assignment in chicken gut microbiota

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Metagenomics is a discipline, which investigates microbial communities sampled directly from their environment (e.g. soil, sea water, human or animal gut) without the necessity to isolate or culture single organisms. The use of high-throughput sequencing (HTS) techniques, based on the nucleotide sequence of 16S rRNA, made much progress in this rapidly expanding research field and has improved our understanding on the composition and diversity of the microbial communities. Taxonomic identification is key step to all microbiology studies. Identification is greatly affected by the choice of database. The goal of this study was to characterize the microbiota composition of gastrointestinal tract (GIT) of chickens, and to compare of three widely used 16S databases, namely Greengenes, Silva and RDP. The 50 most abundant and 50 most prevalent bacterial operational taxonomic units (OTUs) were used to compare the differences in taxonomic assignments made using different frameworks. Data were summarized at the genus level.

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Predicted functional profiles of the chicken gut microbiota using metagenomic 16S rRNA amplicon data

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The characterization of phylogenetic and functional diversity is a key element in the analysis of microbial communities. Predicting functional profiles through amplicon-based sequencing of marker genes, such as 16S rRNA gene analysis is promising tool to elucidate the metabolic capabilities/predicting functional profiles of microbial communities. "Function" usually refers to gene families such as KEGG Orthologs and Enzyme Classification numbers. Marker gene analysis is frequently used for broad studies that involve a large number of different samples, because 16S rRNA sequencing is more cost-effective than whole metagenome shotgun sequencing. However, in comparison to shotgun sequencing approaches, insights into the functional capabilities of the community get lost when restricting the analysis to taxonomic assignment of 16S rRNA data. Due to the continuous development of the method, already are software packages (e. g. PICRUST2, Tax4Fun), which predict the functional profile of a microbial community just from 16S rRNA sequence data. The aim of current study was to characterize differences in jejunal and caecal microbial communities, functions and metabolic profiles of broiler chickens using 16S ribosomal RNA (16S rRNA) gene sequencing. Based on the functionality prediction, a clear difference in the KEGG Orthologs (KO) composition between jejunum and caecum was detected.

This research was supported by the Hungarian Government and the European Union, with the co-funding of the European Regional Development Fund in the frame of Széchenyi 2020 Programme GINOP-2.3.2-15-2016-00054 project. The publication is supported by the EFOP-3.6.3-VEKOP-16-2017-00008 project. The project is co-financed by the European Union and the European Social Fund.

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Metodological experiences of metagenomical studies focusing on soli microbiome

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In our research, we examined the effect of different land use patterns on microbiome communities in long-term experiments.

In he long-term experiment, set in the 60s, in Keszthely, in winter wheat, winter wheat, maize, maize crop rotation, effects of cultivation methods (plowing, shallow disc and minimal cultivation methods) and different amounts of N fertilization (0, 120, 180, 240 and 300 kb / ha) are being examined.

From this long-term experiment, 16 samples were taken from plowed and minimally cultivated, as well as 0 kg / ha and 180 kg / ha N replacement fields in 4 replicates.

After DNA extraction from the samples with soil kits, sequencing was performed on the Illumina MiSeq platform, where 100-250 thousand 300 pb paired-end readings were obtained per sample based on 16S rDNA sequencing.

For bioinformatics use of the data, we used Qiime1, Qiime2 open source, and MicrobiomeAnalyst R-based and Qiime View online evaluation softwares. Based on the evaluations, we found a significant difference: i) between N0 and N180 in classes BD7-11, Nostocophycideae, RB25, SHA-109 and ii) between minimum and conventional cultivation methods in classes Pedosphaerae and Betaproteobacteria. At the order level, the Pedosphaerales order showed a significant difference. Family and Species level differences could only be detected with the Quiime2 software, based on which we found a significant difference in the amount of Microlunatus gram positive bacteria belonging to the Propionibacteriaceae family in favor of the minimum cultivation method.

This work/research was supported by the Hungarian Government and the European Union, with the co-funding of the European Regional Development Fund in the frame of Széchenyi 2020 Programme GINOP-2.3.2-15-2016-00054 project.

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Quo vadis green innovation strategy in Hungary?

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Green infrastructure, green city, green innovation and green economy. Nowadays, we can encounter the combinations and concepts that start with the word 'green' more and more often, in almost every area of our life. The new industrial revolutions are reaching each other, which is a challenge for all the inhabitants of the Earth. The man of the new era creates a connection between the Fourth Industrial Revolution and the possibilities of solving real-world problems. The world's major development centers are moving toward a bio-based society, from the health industry to agriculture. Thanks to the new knowledge, less waste is generated in the production chain, making optimal use of what farmers produce, collect and what we consume. In the Fourth Industrial Revolution, the bio-based development will be an alternative to fossil-based products, both in the production of new drugs and in bioenergy, bioplastics and new biochemicals. Green development of the human living space will be an integral part of this evolution. While the proportion of the urban population is growing worldwide, science is based on the newest technologies listed above, 'green knowledge' is still only moderately based on major innovations in science. Embracing the innovation of urban green living space is one of the urgent tasks of the natural science. Not by being confined to the ivory tower, but by organizing into large research groups, under the strong control of the civil sphere, we need to create a smart and green world around us. Under the Pannon Breeding program, the Research Institute for Fruitgrowing and Ornamentals, National Agricultural Research and Innovation Center (NARIC) has set out to coordinate a professional program in this area. The competent natural scientific methods and results that are available to us in the field of green innovation in Hungary will be presented. We've also traced the work of forgotten professionals who show the way for today's developers. We've also traced the work of forgotten professionals who show the way for today's developers. We also reviewed older knowledge of green Hungarian infrastructure experiences. Among them are the great Palmhouses designed by the architect Miklós Ybl, built by Archduke Joseph in Alcsut, and the innovative solutions of the historical gardens from today's point of view. Based on this, our suggestion is that the Hungarian greening program should be called the "József Nádor Plan", as previously represented in the Ignác Darányi Plan in agriculture.

The research was financed by the „Complex Rural Economic and Sustainable Development, Elaboration of its Service Networks in the Carpathian Basin (Project ID: EFOP-3.6.2-16-2017-00001, Hungary)" project.

Judit Katalin FEJES

Impact of climate change on migration

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If we observe the background of immigrants appearing in Hungary, we can see that they came from the Western Balkans, North Africa, the Middle East, and sub-Saharan Africa.

In the last few decades, the problem of climate change and global warming has flowed into the lives of not only scientists but, unfortunately, ordinary people. The vast majority of scientists treat it as a fact that climate change will directly or indirectly, but generate a multitude of conflict situations, which will force many people to leave their homes permanently.

Of course, the conflicts of the 21st century cannot be attributed solely to climate change, but it seems certain that the resulting security risks will increase significantly and continuously. The basic position in the scientific world, then, is that climate change alone does not necessarily cause social cataclysms at present, but it is an undoubted fact that it amplifies them.

Africa is the continent most affected by climate change today. According to 2015 data, four of the world's ten climate-affected countries are located in Africa. These countries are Mozambique, Malawi, Ghana, and Madagascar.

Given that 60% of the continent has a desert or dry climate, even the smallest changes will severely affect the sensitive ecosystem. To exacerbate the already alarming picture, the vast majority of Africa's population still lives on agriculture today and does not have enough reserves to adapt to these changes in the long run.

However, it cannot be said that African people are leaving and leaving their homes solely as a result of climate change, but it is quite certain that this will also make a significant contribution to the process.

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Are ''good guys'' more likely to buy local food?

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In recent years consumer interest in local food has experienced a significant increase around the world, particularly in the USA and Europe. As a result, various forms of organisation have been developed to manage food distribution. Generally termed short supply chains (SSCs), they are often described as alternative insofar as they are contrasted with the mainstream supply chain (MSC) where the distance between place of production and place of consumption has grown and often become non-transparent. While consumer demand for local food is driven by a perception of fresher, safer and healthier food. SSCs have also been found to represent a means for con- sumers to satisfy their need to conserve social and environmental aspects of farming.

The aim of the research is to analyse the consumer preferences for local food. More specifically, the paper provides an empirical assessment of consumers buying local food to ascertain whether, and to what extent, those regularly buying local food show differences in terms of what is more personal and subjective, such as universal values and food-related lifestyles, compared with those who do not buy. In order to assess such relationships, data were collected from a national wide representative survey. For comparison, a group of consumers buying conventional food were also interviewed in Hungary. Data were analysed with the propensity score matching method. Our results show that the decision to buy local food is especially dictated by profound ideological and emotional considerations. They emphasise the interest in preserving, protecting and sustaining the welfare of other people, in line with the fundamental purpose of short supply chains.

Attila FŰRÉSZ[1] - Adrienn HURTA[2] - Erzsébet KISS[3] - Gergely PÁPAY[4] - László KOVÁCS[5] - Norbert PÉTER[4] - Csaba Lantos[6] - Károly PENKSZA[3]

Morphotaxonomic and ploidy analysis of dominant Festuca species in sandy grasslands along the Danube

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Our goal is to check and revise the dominant Festuca species of vegetation types formed under extraordinary conditions through morphotaxonomic and ploidy analyses. To accomplish this, we had to add examinations of dominant species in grasslands further from the Danube in the Carpathian Basin and East Central Europe, and also near-natural sown grasslands along highways. Individuals of examined taxa were analysed using 22 parameters in inflorescences, and these data were analysed using multivariate statistical methods. Ploidy was analysed using low cytometry. We verified F. vaginata and F. pseudovaginata from open sandy areas. In closing grasslands F. javorkae and F. wagneri appears. In Slovakia we found F. wagneri and F. pseudovaginata as new species in the country's flora. We could add new appearance data of F. javorkae, and describe F. brevipila as a new taxon of the Hungarian flora. Furthermore, a possibly new species also appeared during our research, on which we found distinctive morphological features, but to describe it as new species it needs further ITS analyses.

This work was supported by OTKA K-12543.

Zoltán GABNAI[1] - Attila BAI[2]

Opportunities for wastewater heat utilization in urban district heating

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According to the statistics, significant amount of waste heat is lost in different sectors every year. As alternative energy production and recovery options come to the fore, wastewater heat recovery can play more and more important role nowadays. Its use (as alternatives for heating and cooling) can contribute to sustainability and circularity goals, solving and mitigating current problems such as energy security, increasing environmental problems and greenhouse gas emission reductions, or even the depletion of energy sources. Although most of the energy content of wastewater appears in its heat content, and the coefficient of performance of wastewater heat recovery is quite favorable, it should be mentioned that the use of this technology is limited by several factors. The biggest obstacle can be the wastewater flow of the given sewage pipe and its distance from the application site. In our presentation, we introduce domestic and international trends and characteristics, as well as the most important advantages and limitations of the topic. We also mention the factors influencing feasibility, economic aspects and reduction of CO2 emissions and future development directions as well. Lastly we made recommendations for the future application, considering the efficiency and profit expectations.

This research has been supported by the National Research, Development and Innovation Office through the project nr. 2019-1.3.1-KK-2019-00015, titled "Establishment of a circular economy-based sustainability competence center at the University of Pannonia", the Higher Education Institutional Excellence Programme (NKFIH-1150-6/2019) of the Ministry of Innovation and Technology in Hungary, within the framework of the 4th thematic programme of the University of Debrecen, and the ÚNKP-20-4 New National Excellence Program of the Ministry of Human Capacities.

Zoltán GABNAI[1] - Attila BAI[2]

Possible role of urban wastewater treatment plants in circular economy

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Although urban wastewater treatment plants are among the largest energy consumers of municipalities, they can play a very important role in local energy and nutrient management due to integration of energy production and resource recovery during clean water production. In addition, the use of properly selected technological elements can lead to significant emission reductions. Nowadays, there is an increasing focus on the utilization of the energy and nutrient content of the influent wastewater, which also contributes to the implementation of the circular economy in settlements or regions. In our presentation, we present the local energy and nutrient management and self-sufficiency possibilities of urban wastewater treatment plants through the description of the current situation and international good practices. We also cover the modifying effects of the regulatory environment, local conditions and sizing, as well as the range of products that can be produced based on this type of waste management. Furthermore we highlight the main challenges and obstacles related to the topic, and describe the requirements of the wastewater treatment plant of the future, according to the principle of circularity.

This research has been supported by the National Research, Development and Innovation Office through the project nr. 2019-1.3.1-KK-2019-00015, titled "Establishment of a circular economy-based sustainability competence center at the University of Pannonia", the Higher Education Institutional Excellence Programme (NKFIH-1150-6/2019) of the Ministry of Innovation and Technology in Hungary, within the framework of the 4th thematic programme of the University of Debrecen, and the ÚNKP-20-4 New National Excellence Program of the Ministry of Human Capacities.

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Examination of inorganic chemical parameters of non-aerated compost tea

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In recent years intensive breeding methods have become increasingly dominant in animal husbandry. This is especially true in the poultry sector, which has undergone significant development in recent decades. Intensive systems produce large amounts of manure. Composting manure is an efficient method, requiring significant investments, but the decreasing and transforming organic matter content of soils is the reason why manure disposal is necessary. A compost tea made from compost or manure can be an effective method to nutrient replenishment without losses and environmental pollution. Compost tea is a concentrated, retarding liquid product that enhances soil life and is easier to apply to crop production technologies.

The aim of this study was to produce a non-aerated compost tea from a mixture of deep-litter broiler and chicken manure treated with intensive composting. We examinated the effect of compost/water ratio (1:2.5-1:20), extraction temperature (20°C; 35°C; 50°C) and extraction time (24h, 48h, 72h) on the most important parameters of the prepared solutions (pH, electrical conductivity (mS/cm), nitrate, ammonium, phosphorus and potassium content).

Based on our results, it can be stated that the compost used as a based material largely determines the content parameters of the solutions. Regarding the pH of the solutions, it can be said that by increasing the extraction time and temperature the pH decreases, which can be explained by the anoxic conditions in the solution. As the compost: water ratio increases, the eletrical conductivity of the solutions decreases. Regarding the nutrient content, the N-forms, P- and K content of the solutions increased significantly with increasing extraction time.

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GÖLLÉNY-KOVÁCS Nikoletta[1] - KATONA Andrea[1] - PÉTER Erzsébet[2]

Mezőgazdasági vállalkozók jövedelmét és technológiai fejlettségét befolyásoló tényezők vizsgálata

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Kutatások igazolják, hogy a ma ismert, fejlett technológiák és szakismeretek komplex alkalmazásával jelentősen növelhető lenne számos országban a növénytermesztés és állattenyésztés hatékonysága, amivel párhuzamosan csökkenteni lehetne a környezeti lábnyomot is, ehhez azonban számottevő pótlólagos beruházások szükségesek. Jelen kutatás ezért célként tűzte ki, hogy kérdőíves megkérdezések segítségével feltérképezi a hazai mezőgazdasági vállalkozók helyzetét, különös tekintettel a vállalkozásból keletkezett jövedelem nagyságát és az aktuális technológia fejlettségi szintjét befolyásoló tényezőkre. A kutatás a Dunántúlon készült és leginkább szántóföldi növénytermesztők válaszaira épült, de a megkeresés kiterjedt haszonállat-tenyésztőkre, szőlő- és bortermelőkre, méhészekre és gyümölcstermesztőkre. Eredményeink azt igazolják, hogy a technológiai fejlettség és a keletkezett jövedelem nagysága is a gazdálkodási terület nagyságával áll kapcsolatban, amit multikollinearitás kimutatásával sikerült igazolni. A gazdálkodási területek összpontosítása azonban több problémára is megoldást kínálhatna.

Erzsébet GYÖKÉR[1] - Fanny FEHÉR[2] - Anita CSIBA[3]

High-keratin-content slaughterhouse by-products processing for petfood or cosmetics raw materials

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In this study we examined such a high-keratin-content slaughterhouse by-product like a pig bristles and feathers. This is one of the main topics of our industrial research in GINOP-2.1.1-15-2015-00685 numbered, „By the KOMETA'99 Company's slaughterhouse produced by-products processing for industrial fat and different feed flours for semi-finished raw materials or petfood finished products production, development and using possibilities" titled project of KOMETA'99 Company in Kaposvar. Our first and most important aim in this research to make a decision about the using direction of a final products. Only after our decision can we determine the most optimal treating and processing method for these slaughterhouse by-products. In our modell experiment we can produce different products for example raw materials for cosmetics and petfood products. But the requirements of two main using way are very different. The most important requirement for the production of protein flours for petfood is the highest possible digestible protein content and in the case of cosmetic products raw material is the highest possible keratin content. Production of the cosmetics raw materials are more profitable, but involves more risks, because there are more requirements for the raw materials and procution. Therefore in this industrial research and experimantal development our primary goal is processing of the slaughterhouse by-products for feed flours for petfood raw materials. However during the feed flour production we have to breakdown the keratin into digestible protein with a long-time-interval, high-temperature, high-pressure hydrolysis treatment. The feed flours made from pig bristle- and feather after this treatment have a high digestible protein content and valuable amino acid content and these could complete with their amino acid content the amino acid content of the meat flours or fish flours in the dry petfood ingredients.

István Ervin HÁBER

PV production peak shifting with thermal storage

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It is a widely known problem that at peak production of renewable energy systems, the electric grid becomes overloaded. Energy storage on grid level is still a critical issue. Inventions related to development and control of smart buildings, including integrated solar systems can be easily realized by smart control of building management including storage. At governmental buildings, which have high heat capacitance the part of stored heat can be used for grid load stabilization. In other words, the grid is balancing with well-set up heating strategy and well-scheduled timetable via intelligent heat control of buildings. Assuming proper heat insulation of the building, the excess energy can be stored as heat when the intelligent building management system is prepared for this. A possible solution is introduced in this paper, where the surplus production is used for overcooling the building, while the building thermodynamic properties are making it possible to store this amount of energy for days. The necessity of this solution was aggregated by a Hungarian law anomaly, but this type of control can be a basic way to energy storage in every building equipped with photovoltaics system. This paper investigates the potentials and analyses cost-effective solution of grid energy storage, through a case study.

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Investigation of effect of plant-conditioning agents in field crops: a study of multispectral remote sensing supported by gene expression analysis

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Nowadays, the use of natural material-based biostimulants plays a key role in organic farming, which may exert their beneficial effects on different biological cycles and physiological processes. In our studies, monocotyledonous and dicotyledonous field crops were treated and compared with two commercially available products, Fitokondi (Volánpack Ltd.) and Elice16 Indures (Researh Institute for Medicinal Plants and Herbs Ltd.). Crops were planted and harvested in 2019. Both products successfully stimulated the vitality of pea and spring barley cultures cultivated in small-parcell, but different biochemical processes were found to be stimulated and inhibited. During spectral monitoring drone technology were used. The applied agricultural drone was equipped with an RGB and near-infrared camera, that was used to take images 3 times during the vegetation cycle of plants, according to different maturity stages. In addition to the vegetation index (NDVI), other spectral indicators were calcullated as well, which were characteristic of the state of vegetation. Based on this indexes - from different vitality showing parcells - biological samples were collected for molecular biological studies. Using new-generation sequencing, physiological processes that may stay in the background of the spectral differences were determined. Whole-transcriptome data and targeted gene expression were analysed, which investigations indicated enzymatic differences mainly in photorespiration, photosynthesis and oxido-reduction processes.

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Személyes adat megosztásának hajlandósága személyre szabott szolgáltatásért a Z generáció körében

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A szolgáltatások és az ajánlatok személyre szabása egyre elterjedtebb jelenség mind a szolgáltatók mind a marketingesek körében. Az egyén érdeklődésére szabott online hirdetésektől kezdve a személyre szabott nyaralásokig, a kereskedelem és a turizmus szinte minden területén használható. Ezzel párhozamosan ugyanakkor egyre inkább megjelenik a felhasználók, vendégek adatvédelmi érzékenysége. A személyre szabás – adatvédelem paradoxon (personalisation- privacy paradox) egyre több kutatót foglalkoztat, ugyanakkor sok esetben figyelmen kívül hagyják a célcsoport jellemzőit. Jelen kutatásban a Z generáció tagjait kérdeztük meg arról, mennyire tartják fontosnak a személyre szóló ajánlatot, és milyen információkat adnának meg magukról annak érdekében, hogy egy egyedi szolgéltatást kapjanak. Az adatmegosztási hajlandóságot szállodai szolgáltatások példáján keresztül néztük. Fontosnak tartottuk, hogy a kutatás első körös lekérdezésében, olyan Z generációs fiatalokat kérdezzünk meg, akik jártassak a turizmus területén, így úgy mond szakerői szemmel tudnak tekinteni az adott szolgáltatásokra és van ismeretük a mögöttes folyamatokról.

Dávid HOMOKI[1] - László KOVÁCS[1] - Dániel MINYA[1] - Áron MOLNÁR[1] - Milán FEHÉR[2] - György KÖVICS[3] - László STÜNDL[4]

Examination of basil (Ocimum basilicum L.) and Common carp (Cyprinus carpio L.) in media culture and floating raft aquaponics systems

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The integrity aquaculture technologies principle is that organic waste of one production cycle is utilised by another production cycle as nutrient. The name of their synopsis is the is the Integrated Multitrophic Aquaculture (IMTA). The aquaponics based on different technological principle constitute a special part of the IMTA systems. The aquaponic is a complex system where integrated breeding of the fish (aquaculture) and plants (hydroponic) happen. The aim of the experiment was to analyse aquaponics with different plant growing units, over integration of the basil (Ocimum basilicum L. Genovese) and common carp (Cyprinus carpio L.) as well as the effects of the different technological systems were also examined.

Systems with two different crop production units were set up. The media culture aquaponic (MAqP) was operated with ebb and flood technology, and the floating raft aquaponic (FloS) was operated in constant flow system. Mixed sex carps (n=72) were put into the fish tanks of the MAqP and FloS, their mean initial weight was 72.3g (± 9.1). The total planted basil biomass in the media culture aquaponic was 48.63g (n=12) and in the floating raft was 46,75g (n=12). The physical parameters of the water (temperature, DO, pH, EC,) were measured in the fish tanks daily. The chemical parameters of the water (NO_2^--N, NO_3^--N, NH_4-N) and growth intensity of basil were examined weekly. The experiment lasted for 56 days. The plants were retorted to mean 19.72 cm (± 3.8) height on the 28th day. The basil biomass and the production indexes of the fish (SGR, FCR, WG, PER) were determined at the end of trial.

Mortality was not observed in the experiment (SR%= 100). All the measured physical parameters of water showed significant differences ($p < 0.05$) in every fish tank. Conformation of the nitrogen forms was more favourable in the MAqP system. The highest basil biomass was produced by floating raft (654.76g), the plants were the highest in the MAqP units (36.58cm ± 5.7) before riposte, and after the first harvesting in the FloS system (29.33cm ± 7.1). Weight gain of basil (PWG) was 0.43 kg/m2 in the floating raft while in the plant from bed of media culture, it was 0.41 kg/m2. Between production parameters of carps there was not difference ($p > 0.05$) between the systems. Higher fish growth was observed (SGR: 0.78 % d-1 ± 0.003) in the media culture aquaponic during the complete period of the experiment and the feed was utilized more favourable proportion by the fish (FCR: 1.18 g/g ± 0.0) but it was not showing significant different ($p > 0.05$).

The weight gain of carps (FWG) were in the MAqP system (2.37 kg/06m3) the units of FloS (2.28 kg/0.6m3).

According to the results, the water quality of the system and through this the productivity of the plants and fish are determined essentially by the composition of the crop units of aquaponic.

HORVÁTH Gergely[1] - POÓR Judit[2]

Az e-WOM - avagy a vendégelégedettség online megjelenési formáinak szerepe a szálláshelyválasztásban

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Az online utazási irodák (online travel agencies - OTA) nem kizárólag a foglalás, az értékesítés meghatározó csatornái napjainkban, hanem az információgyűjtés, a szálláshelyszolgáltatásokkal kapcsolatos tájékozódás csatornái is. Az OTA-n fellelhető információk egy része objektív, más része szubjektív, utóbbiak a fogyasztói információk, vélemények. A szálláshelyre vonatkozó szubjektív információkat az OTA oldalak vendégértékelései biztosítják.

Jelen kutatás két területre fókuszál. Részben a legnépszerűbb hazai, illetve nemzetközi OTA oldalak vendégértékelési rendszerének összehasonlítását (hitelesség, skála, szempontrendszer, vendégkategória) célozza.

Mindemellett szálláshelyszolgáltatást igénybe vett vendégek körében végzett felmérés eredményei alapján vizsgálja, hogy a foglalási csatornától függetlenül milyen csatornán keresztül szerez információt a vendég a szálláshelyről, illetve választásában végül mely tényezők játszanak szerepet. A kérdőív kitért a szálláshelyszolgáltatás igénybevételét követő elégedettség mérésére is, ezzel összefüggésben vizsgáljuk az eredmények alapján a visszatérés, illetve a bármilyen csatornán megvalósuló pozitív és negatív kommunikáció valószínűségét.

Gizella JAHNKE[1] - Gyöngyi KNOLMAJERNÉ SZIGETI[2] - Csaba NÉMETH[2] - János MÁJER[1]

Facing the climate change:

reaction of Italian Riesling clones to global warming in Badacsony, Hungary

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The Italian Riesling, as typical regional cultivar adapted to the climate of the Carpathian Basin, but the effects of climate change are detectable even in this cultivar as well. The increasing frequency of arid years in Badacsony, Hungary lead to quantity and quality problems in late ripening grapevine cultivars as well. The most important quality problem in white wine cultivars – such as Italian Riesling – is the significant loss of acids in the harvested grapes and processed must. To overcome this issue clonal selection breeding must move towards the clones with higher acid content.

In this study the meteorological data of 19 years and harvest results of 12 Italian Riesling clones in these years (2001-2019) were evaluated. Summarizing the results, it could be concluded, that the B. 14/14 clone of Italian Riesling with relatively high yield and acid content, could be a new starting point for the future clonal selection.

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Élőhelytérképezés az Ipoly, mint természetes állapotú vízfolyás mentén

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Az Ipoly mente élőhelyei a természetes jellege miatt mozaikos megjelenésűek. Az Ipoly folyó lineáris voltának köszönhetően különösen kitett a környezeti tényezők változásának a terület, első sorban a csapadék és az ezzel szoros kapcsolatban lévő vízállási viszonyok vegetációban kimutatható változására ez által jól követhető. A mintaterület kiválasztásakor szempontunk volt, hogy olyan jellemző vegetáció együttest vizsgáljunk, aminek monitorozása a táji szintű változások szempontjából, szélesebb tájegységre vonatkozón is kiterjeszthető. Jelen tanulmány az Ipoly menti dejtári terület élőhely térképének bemutatásával foglalkozik, ahol a természetes folyamtok mellett, a tájhasználat (legeltetés, kaszálás) is jelentős, amiért leginkább alkalmas a változások bemutatására és az általánosításra is. A műholdfelvételek közül a Sentinel-2A műhold adatait használtuk, mely része az Európai Copernicus programnak (Sentinel), ami 10 méter és 60 méter közötti felbontást kínál (Drusch et al. 2012). A vizsgálat során olyan kérdésekre kerestük a választ, hogy a klasszikus és a műhold alapú térképek pixel adatai között van-e átfedés és ezek az eltérések hol mutathatók ki. Továbbá a normalizált vegetációs index (NDVI) és a térképezett kategóriák között kerestük az esetleges összefüggéseket. Az élőhelyfoltok kategóriarendszerét az ÁNÉR kódok adják, mely a QGIS térképészeti program segítségével készült. A vízterek és urbánus területek jól elkülöníthetők más természetes élőhelyektől, ez a megfigyelés fennállt a természetes vegetációtípusoknál is, a gyepek a fás vegetációk esetében. A klasszikus élőhely térképezés foltjai több ponton egyezést mutattak a távérékelési adatokkal, mintegy jó kontrollként is szerepeltek olyan területeken, melyek nehezen megközelíthetőek. Ezen túl az egyes foltokon belüli elkülönítések is kimutathatók, mely további információval szolgálnak a területhasznosításról, továbbá legeltetés szempontjából is jól hasznosíthatók. A domináns *Festuca* fajok alapján biomassza vizsgálatot is végezetünk, mai szintén jó egyezést mutatott az NDVI értékekkel. A kutatást a „Az Innovációs és Technológiai Minisztérium ÚNKP-20-3-II-SZIE-16 kódszámú Új Nemzeti Kiválóság Programja”, 20430-3/2018/FEKUTSTRAT project és az OTKA K-125423 pályázat támogatta.

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Effect of soil bacterial treatment on vegetative parameters of Chlorophytum comosum 'Vittatum'

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It is not only the growth rate and aesthetic value of outdoor and indoor ornamental plants but also the lifespan of potted plants, moreover their health condition that are largely influenced by nutrition and water supply, too. Greater biomass and diameter of roots can provide better nutrient supply, it can increase drought-tolerance and plant vitality due to the more root mass. Several areas of agriculture (crop, fruit, grape, vegetable production) have already positive results in soil bacteria treatments. In our experiment we observed the effect of the soil bacterial product on Chlorophytum sp. in six months. In the experiment we used the Mikro-Vital P+ soil bacterial preparation. We measured the vegetative parameters (plant weight, plant height, number of leaves, leaf length, root weight, root diameter, root length) and relative chlorophyll content of the leaves. The microbial product we used the recommended concentration, which does not contain chemical and hormonal compounds. Based on the results of the experiment, we can confirm that the leaf length, the root mass, the root diameter of the treated plants was higher by an average 10-13 percent than those of the control ones. Based on the results recommended to use them for potted plants as well.

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Estimation of the amount of contaminants stored in groundwater using geoinformatics methods

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Contaminants accumulate in the soils and groundwaters due to natural process or industrial activities. It is a serious environmental issue which needs to be managed by society. Uncontrolled emission of contaminants last for decades and lead to severe environmental pollution which can only be managed by expensive remediation measures. Nowadays, the amount of contaminants, occurred under the surface in different phase, can be monitored by several geoinformatics softwares, which can help to identify the sources and the spreading of contaminants in order to facilitate the remediation process.

The aim of this study was to present a geoinformatics process of remediation work on industrial site in a lowland area. The work emphasised mainly on estimating the amount of the contaminations in the soil and examined their spatial distribution.

This work was supported by the construction EFOP-3.6.3-VEKOP-16-2017-00002. The project was supported by the European Union, co-financed by the European Social Fund.

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Industry 4.0 solutions in the domestic corporate sector

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The practical implementation of Industry 4.0 technology is becoming increasingly important in Hungary, too, and the network of systems creates smart factories. It gives the production systems and people the opportunity to communicate with each other through a network, by which the production becomes automated and the human workforce can be replaced in each work process. Business leaders need to adapt to technological, organizational, and cultural changes. In our quantitative research, we asked executives from 140 small, medium-sized, and large companies about how open they are to the technology offered by Industry 4.0. Our study focuses on the quantity, price and quality of R&D services related to Industry 4.0 available on the domestic market. In fact, research on this topic is becoming more and more important as businesses continue to grow dynamically, and new digital technologies, corporate and human resource management trends are emerging as a result of economic change. It is crucial for company leaders to follow and apply these trends if they do not want to fall behind their competitors.

Tamás KISMÁNYOKY[1] - Attila DUNAI[2]

Examining yearly fluctuations in a long term cereal field experiment

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Our research work was based on the IOSDV/ILTE field experiment in Hungary, University of SZIE Georgikon Faculty Keszthely. The aim of our study was to reveal the main reasons which usually cause the measurable and significant fluctuation in yield of cereals over the years in the long term field experiment. The agronomic factors, the treatments and the whole LTFE were unchanged in the period of 1984-2013, but the climatic factors, mainly the amount and distribution of the precipitation and temperature are different each year and growing seasons. During the 30 years, 10 crop rotation turns had occured and it is presumable, that the data base included every types of years what are typical around the experimental site. The statistical methods to analyse the results and the effects of the annual climatic conditions were following: Duncan's multiple range test, ANOVA two factorial strip plot, grand mean comparisons (G), Pearson correlation matrix, coefficient of variation (CV).

Yield data for each year show significant variation from year to year based on the main experimental averages. Annual fluctuations are significantly smaller in organic and fertilizer treated treatments compared to controls. Based on 30 aggregate colleration matrices, it is typical for the whole study that all treatments give a positive correlation with precipitation and a negative correlation with temperature. The development of meteorological data confirms the facts of warming and the decrease of precpitation. The adverse effect of this phenomenon on yield can be clearly demonstrated for winter barley, in case of winter wheat and maize, this relationship cannot be reliably demonstrated during the study period.

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Beliefs, perceptions and attitudes towards climate change: A case study in an Eastern Hungarian settlement with questionnaire survey

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Climate change is one of the greatest and far-reaching problems facing humanity today. Eurobarometer surveys and numerous studies had revealed, that a large majority of people in Hungary believe climate change is an important issue and a serious problem. Nevertheless, recognizing the problem don't automatically mean individuals start to take actions. Furthermore, mitigation and adaptation related actions depend on socio-demographic characteristics and the level of knowledge, risk perceptions, attitudes and public awareness. In addition, knowledge about climate change causes and consequences are quite defective and many uncertainties remain. Knowledge expansion may lead to perceive the potential risks, but first, decision makers need to know relevant information about the current state not only in national but in local level as well.

During our work we developed a questionnaire about climate change knowledge, beliefs and perceptions, which was used for the investigation. The representative survey was conducted among inhabitants in an Eastern Hungarian settlement, Újszentmargita (n=90). The respondents were selected using random walk and face to face survey technique. It was carried out with Leslie Kish systematic survey sampling method by selecting households. The study introduces our results about respondents concerns, relative importance, understanding and knowledge about climate change, attitudes towards climate change, moreover the perceptions and personal actions in relation to climate change.

Lívia Benita KISS

Economic issues of agricultural and food industry investments in Hungary in the last decade

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The competitiveness of Hungary's agriculture can only be preserved and improved through continuous development, which investments must adapt to climate change, which also affects Hungary.

The volume of investments has been put on an increasing path by the EU-funded developments starting in 2013 and the change in the economic policy environment. The significant decline in investment was due to the completion in 2016 of projects funded using funds from this EU cycle (2007-2013). The increase in investment activity in 2017 (+ 24%) was only partly due to the new projects of the next EU budget cycle (2014-2020), as enterprises also started to expand their capacity due to the economic boom. The 15% increase in investment volume in the following year was the result of construction investments by larger companies.

Livestock accounted for the largest share of the value of agricultural investments in the period under review. The livestock sectors were under development and investment, due to compliance with environmental and animal welfare standards, as well as increased competitiveness and efficiency.

The performance value of food industry investments also showed an increasing trend in the period under review. A significant part of the investments was directed to machinery and equipment, as well as buildings and structures, which were mostly financed from own resources by food companies. In addition to using their own resources, they made their investments from bank loans and grants. Among the food industry sectors, the largest and most significant investments were made in the poultry meat processing and preservation sector.

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Improving the water management properties of different soil types

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One of the most important function of soils is fertility. This function is closely related to soil water management, because the factors inhibiting fertility are mainly related to soil water management According to it, the consideration and improvement of soil water management properties are essential for modern and economical agricultural production.

The effects of different additives on the water balance of clay, sand and loam-textured soils were studied in modell laboratory experiments. One of the most important criteria for the selection of additives was that the substance should not be harmful to the environment. It was also important that after the additives were added to the poultry manure, they did not impair its properties or inhibit its active ingredient content. Based on these considerations, four mineral-based additives (clay granules, alginite, bentonite, zeolite) and three superabsorbent polymers (Aqua Perla, Stockosorb, Zeba) were used. In our research, our specific goal was to investigate and evaluate how each additive affects the (1) capillary water-lifting capacity and (2) soil water holding capacity.

Based on our results, only a few amount of superabsorbent polymers were able to absorb moisture in the soil layer and restrict water movement between the soil layers. The effect of mineral-based additives was not so strong than founded at the application of superabsorbent. Moreover, these additives also had a positive effect on the water balance of soils.

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Environmental utility of Celtis and Styphnolobium species in urban environments according to tree age

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The environmental benefits of trees are obvious, as they have a positive effect on the microclimate of cities, be it a park, a public area planted with trees or a road lined with trees. We cannot neglect their importance in the filtering of dust and other pollutants. The proportion of green areas in Kecskemét has decreased significantly in the last decade, therefore, the maintenance and development of green infrastructure is a priority. With our study, we want to prove this significance through the example of two genus. Our survey was carried out in the center of Kecskemét, where *Celtis occidentalis* and *Styphnolobium japonicum* species are present in high proportions among woody plants. Many individuals already attract attention with their habitus. In our study, we estimated the amount of foliage of these trees and thus determined the amount of O_2 they produced and the amount of CO_2 absorbed. We also investigated their role in absorbing particulate matter and increasing air humidity. In our analysis, we also show how the monetary value of these plants changes as a function of their health status and age.

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Examination of the greenhouse gas emission of the tourism sector in Hungary

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Increasing in greenhouse gas emission is nominated as the reason of global climate change, and tourism is one of its anthropogen sourses. Our research aims to investigate how much tourism as an ecological sector contribute to the greenhouse gas emission, are there tendencies in time of the emission of the gases and is there any correlation between the emission and the gross added value produced of the sector. The carbon-efficiency of the sector was analysed (how much emission is required for production of a unit of the gross added value). Between 1995 and 2017 an average decrease of 5.8% can be seen per a year. The data of the Hungarian Statistical Office were used for the researsches.

KOVÁCS Barnabás[1] - PACSAI Bálint[2]

Talajszenzorok alkalmazása a megfelelő talajművelési eljárások megválasztásához szőlőültetvényekben

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Kutatásunk egy hosszú tartamkísérletként beállított szőlőültetvényben (46°78'É; 17°48'K) végeztük, amely talajeróziónak kitett homogénen mind a nyolc talajfedési illetve művelési eljárásnál. Az érzékelők (összesen 24) 15 percenként négy paramétert (talajnedvesség, levegőhőmérséklet, fény: fotoszintetikusan aktív sugárzás (PAR) és talajvezetőképesség) mértek, és a memóriájukban tárolták mindaddig, amíg okostelefonos alkalmazás (Flower Power) segítségével, havi kézi le- majd a felhőbe feltöltést végeztünk szenzoronként bluetooth illetve mobilinternet kapcsolaton keresztül.

Közel nyolc hónapos felmérést követően .csv formátumban letöltöttük az adatokat, majd RStudio és ArcGIS 10.2 szoftvercsomagokkal kompatibilis formátumba konvertáltuk és feldolgoztuk azokat. Eredményeinket emellett összehasonlítottuk a legközelebbi, tanúsított meteorológiai állomás méréseivel is.

Az adatok értékelésekor néhány eszköz esetében szignifikáns eltérést észleltünk a talaj nedvességtartalmának mérése szempontjából (a pontbéli talajszerkezet jellegéből adódóan), de mivel ez az eltérés szisztematikus volt, kalibrálással könnyen adoptálható lett az adatsor.

A mért talajnedvesség értékek alapján az elhalt növényi szervesanyaggal történő talajfedés eredményezte a legmagasabb értékeket a felszín közeli talajrétegben, és ugyancsak ennél a kezelésnél lehetett a leglassabb száradást megfigyelni a csapadékos időszakokat követően.

A kutatást az EFOP-3.6.3-VEKOP-16-2017-00008 projekt támogatta. A projektet az Európai Unió és az Európai Szociális Alap társfinanszírozza. A kutatáshoz használt eszközöket a GROW Observatory projekt, az Európai Unió Horizont 2020 kutatási és innovációs programjához kapcsolódóan biztosította.

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A kerékpárturizmus helyzete és lehetőségei a Balaton Kiemelt Üdülőkörzetben

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A kerékpáros turizmus piacának dinamikusan bővülése megnövekedett keresletet jelent a Balaton körüli kerékpárút számára, hiszen Magyarországon ez az egyik legjelentősebb potenciális célterület, az egyre erősebb versenykínálatot nyújtó különböző európai országok, régiók között. A Balatoni bringakörutat 2008-ban adták át. Az azóta eltelt időben a balatoni kerékpárturizmus rendkívül dinamikusan fejlődött, de mára a fejlődés legfőbb gátja, a leromlott gerinchálózat állapota. A kiegészítő útvonalak rendszere nagyban kiépült, a biciklibarát szállások száma is megfelelő, a MÁV is sokat tett a kerékpárutasok színvonalasabb kiszolgálás érdekében, azonban a felújítás késlekedése már veszélyezteti az eddig elért eredményeket. A kérdőíves felmérésünkben a jelenlegi biciklitársadalom igényeit, problémáit, fejlesztési prioritásait vizsgáltuk 200 fős kérdőíves lekérdezés keretében véletlenszerű mintavétellel a 2019. év második felében, amelynek az eredményeit szeretnénk bemutatni a konferencián.

Róbertné KOVÁCS[1] - Valéria NAGY[2]

Investigation of dielectric parameters of beers in the microwave frequency range

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It is possible to get to know the chemical and physical properties of materials as fully as possible thanks to the continuous development of technology and science. Increasing the number of measurable parameters of food products and continuously monitoring them contributes to the automation of production and quality control. And last but not least, environmental and customer expectations can meet sustainability. For example, the DAK-3.5 experimental system can be used to study the dielectric behaviour of materials. A liquid (aqueous solution) was selected as the experimental substance: the dielectric parameters of canned beers with different alcohol contents and production technology were studied in the microwave frequency range (200–2400 MHz) at different temperatures (12 ºC; 20 ºC; 30 ºC; 40 ºC; 50 ºC; 60 ºC) and different "bubbling effects" at the moment of opening the can, then 6 hours, 24 hours, 48 hours, 144 hours).

Bubble formation, bubble flow in the beers due to the CO_2 content of the beer and furthermore bubble accumulation on the sensor surface can be observed therefore the examined dielectric parameter (ε') differs from the values of water (as reference liquid) in the same frequency range.

The results show that after 24 hours there is no "bubbling effect" at all for any type of beer, furthermore the dielectric constant is highly variable at lower temperatures (12 ºC; 20 ºC) and <500 MHz frequency values. In the frequency range of 500–2400 MHz, the examined beer samples show similar behaviour, in this range the effects of temperature (change) are marked and time after opening the cans.

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Evaluating the set-up of a wine assessment panel of university students in the case of detecting the effects of a bentonite treatment experiment on dry white wine

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The following is a reoccurring question even in international publications: how is it possible to set up a wine assessment panel of university students which can adequately support the evaluation of an oenological experiment. When setting up the panel, it is a primary question of high-quality wine evaluation, that the judgement the panel gives and the method applied should serve the conceptual issue. Our present work tries to evaluate the reliability and applicability of a tasting panel of university students with mathematical methods, and it compares the results to the value judgement of a panel of experts. As part of a one-semester course, the students participated in a wine evaluation training (4 times 3 hours) following a theoretical training of 4 hours. According to our hypothesis, a newly-trained panel can even be more adequate to give the evaluation in a similar issue due to their „sincereness" than an experienced and professional panel. The above is supported by data from specialised literature as well. The wine for our experiment was provided from the mixture of the new wine from 53 white wine grape cultivars originating from the gene bank of the University of Debrecen's AKIT Practice Farm and Land Research Institute located in Pallag. This wine was treated parallel with 18 different bentonite products in commercial use. The high number of the grape cultivars serves the purpose of our experiment. The samples treated with 18 different bentonite products were made subject to sensory evaluation of one hundred points in accordance with international standards, on the basis of flavour, aroma, appearance, and overall impression. In the case of each characteristic feature, we examined intensity, quality, individuality, and also duration in the case of flavour. The performance of the evaluation panels was analysed according to their discriminative capacity and the degree of consensus. To achieve the above, we applied variance analysis and general linear models. We performed principal component analysis to show the similarity between the two evaluation panels graphically, and also to present the connection between the organoleptic characteristics. According to our results, there is no significant difference between the principal component values of the two groups, neither between their discriminatory capacities, nor between the degree of consensus. Discriminatory capacities proved stronger in both groups mainly as regards cleanliness, flavour quality and overall impression. The greatest consensus occurred in relation to colour, aroma and flavour character and flavour length in both groups. Both the professional and the amateur group had the same results in this regard. However, there were differences between the evaluation panels regarding some organoleptic characteristics according to the linear model. These concerned mainly the assessment of the intensity (aroma and flavour), and the individuality of the flavour as well as the evaluation of the overall impression. Quality (aroma and flavour) and the individuality of the colour and the aroma differed the least. In our view, under appropriate supervision and with adequate discipline, the set-up of tasting panels of university students can support the organoleptic evaluation of similar oenological experiments.

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Quality policy as a reflection of an organization's commitment to quality

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Quality Policy, as one of the foundations of quality development, is the most important document of quality management, which is an officially declared general intention and initiative of the organization stated by the top management. The quality policy describes the organization's quality management system, commitment to quality, quality goals, quality awareness and quality-oriented thinking. Quality policy shows the foundations, intentions and direction of the companiesquality management system, it also provides information for other organizations as well about its position compared to others als also what its strengths are and where opportunities for improvement can be found.

Quality policy, as well as the requirements of the quality management system, has undergone significant change in the recent decades, adapting to both market expectations and needs. In this research we present the three-decade change and development of the concept of quality policy, and we also aim to detail the development of quality policy requirements in line with market needs and expectations according to the requirements of the quality management system. In addition to the analysis of standards for quality policy, we present an extensive case study how quality policy has changed in the life of an organization in the last ten years, and what are the main elements of an up-to-date and appropriate quality policy in 2020.

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Individual effects of Fusarium mycotoxins on the glutathione-redox system and lipid peroxidation in poultry

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The occurrence of mycotoxin contamination of feeds is a primary problem; thus, the evaluation of their effects is essential. Three common Fusarium mycotoxins, such as T-2 toxin, deoxynivalenol (DON), and fumonisin B1 (FB1), are well known for oxygen free radical formation and consequently lipid peroxidation effects, which is neutralized by the glutathione system within the antioxidant protective system. The in vivo study on laying hen was performed in a short-term (3-day) feeding trial using twice the recommended feed level in the EU (T-2 toxin: 0.5mg/kg; DON: 10 mg/kg; fumonisin B1: 40 mg/kg). We measured the amount (GSH) and activity (GPx) of the glutathione redox system in the liver, as well as the initiation phase of the lipid peroxidation process, formed conjugated dienes (CD) and trienes (CT), and in the terminal phase formed metastable end product, the concentration of malondialdehyde (MDA). The results showed that FB1 decreased the amount of the GSH and the activity of GPx significantly compared to the control group on day 3. Besides that, the amount of CD levels was reduced by the three examined mycotoxins compared to the control and the concentration of MDA was lower in laying hens fed DON as compared to the control group by day 3. Concerning the results, the individual effects of Fusarium mycotoxins were different at the end of the trial, the FB1 decreased the antioxidant markers, while DON decreased the end product of the lipid peroxidation. The results showed that the examined Fusarium mycotoxins differently activated the antioxidant defence system as a consequence of low-level oxidative stress by its individual effects.

The research was supported by the NVKP_16-1-2016-0016 and EFOP-3.6.3-VEKOP-16-2017-00008 co-financed by the European Union and the European Social Fund projects.

LUGOSI-SZABÓ Gergely

Az Agrárminisztérium fenntartói kihívásai a középfokú agrároktatási intézmények pályaorientációjának területen

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Jelen tanulmányban - figyelembe véve annak korlátait - éppen csak felvázolni lehetett az agrárkormányzat pályaorientációval kapcsolatos kihívásait. A három problémakör (generációváltás, agrármodernizáció és agrároktatás megújítása) önmagában is összetett és bonyolult feladatot jelent, melynek csupán egyik szegmense a pályaorientációs kihívás. Kulcskérdés a fiatalok megszólítása, az agrárpályára való orientációjuk megalapozása és a pályán maradásukhoz szükséges feltételek biztosítása. Az elöregedő agrártársadalom pótlása, a technikai újdonságok bevezetése és meghonosítása a magyar mezőgazdaságban csak az oktatás vonzóvá tételén keresztül vezethet eredményre. Az oktatás szerepe megkerülhetetlen, hiszen „tudás nélkül nem lehet sikeres mezőgazdasági tevékenységet folytatni."

Ennek a célnak a megvalósítása érdekében elengedhetetlen a különböző szervezetek szoros együttműködése. A már bevált projektek mellett olyan pályaorientációs kommunikációra és programok közös kidolgozására van szükség, melyek lehetővé teszik a fiatalok megszólítását.

Ezt a feladatot minden agráriumban tevékenykedő szereplőnek magáénak kell tekintenie. Közös érdekünk, hogy vonzó életpálya modellt tudjunk mutatni a fiataloknak, mely meggyőzi őket arról, hogy ebben az ágazatban mindenki megtalálhatja a boldogulását.

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Pályakezdési és pályaviteli kompetenciák megítélése agrár-felsőoktatási hallgatók körében

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A felsőoktatási képzések munkaerőpiaci igényeknek való megfelelése évtizedek óta vita tárgya. Rendkívül fontos lenne a pályakezdéshez szükséges kompetenciák egzakt meghatározása az egyes szakterületeken. Erről azonban a képzési kimeneti követelményeken kívül viszonylag kevés meghatározó információ áll rendelkezésekre. A pályakezdés és a pályavitel sikerességéhez fontos, hogy a pályára készülő fiatalok elképzeléseit ismerjük, elvárásaikat felmérjük.

Tanulmányunkban egy személyes lekérdezéssel végzett kérdőíves felmérésünk csaknem félezer válaszadójának (476 fő) válaszait elemeztük ki. A kérdőívről két nyílt kérdés elemzését végeztük el. Az alábbi, kompetenciák kapcsán feltett kérdéseink voltak: (1) *„Mit gondol, a sikeres pályakezdéshez milyen kompetenciákra lesz szüksége?”*, illetve (2) *„Írjon fel 3 olyan tulajdonságot, ami az Ön szakterületén (véleménye szerint) elengedhetetlen a sikeres pályavitelhez!”*. A nyílt kérdésekre a Georgikon Kar hallgatói körében töltettük ki.

Az első kérdés – a pályakezdéshez kapcsolódó – esetében a problémamegoldás, az alkalmazkodóképesség, a kommunikáció jelent meg, mint elvárás – a válaszadók negyede megjelölte ezeket. Meglepő módon a műszaki és a biológiai ismereteket a válaszadók 1-2 százaléka jelölte meg.

A második kérdés esetében a pályavitelhez kapcsolódó kompetenciák kapcsán a problémák megoldásához, a kommunikációhoz kötötték a sikerességet.

Hallgatóink körében végzett felmérésünket az EFOP-3.4.3-16-2016-00009. *„A felsőfokú oktatás minőségének és hozzáférhetőségének együttes javítása a Pannon Egyetemen”* projekt keretében végeztük. Az A.1.1. alprojektben a hallgatóink sikeres elhelyezkedését, pályakezdését, az ISCED 5-8. szint közötti előrejutását, valamint a várható munkaerőpiaci elvárások és a kompetenciák megismertetését végeztük el. A felmérés további kérdéseinek elemzése mellett a projekt futamideje alatt a munkavállalói oldal véleményét is le kívánjuk kérdezni.

A kutatást az EFOP-3.4.3-16-2016-00009 projekt támogatta.

A projektet az Európai Unió és az Európai Szociális Alap társfinanszírozza.

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Szakok minőségfejlesztésének problémái a felsőoktatásban

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A felsőoktatásban a szakok a képzés alapjai – minőségfejlesztési szempontból megítélésünk szerint ezek a a kulcsfontosságú egységei az egyes intézményeknek. Az előírások – a képzési kimeneti követelmények – egyértelmű kereteket biztosítanak, hogy a képzési folyamat végén milyen tudással, kompetenciával, attitűddel kell rendelkezni az adott képzést elvégző, diplomát szerző szakembernek. A szakok minőségfejlesztése ugyanakkor az egyes képzőhelyeken sokszor komoly problémákkal küzd. Nem egyértelműen meghatározott felelősségi viszonyok, az adminisztratív folyamatok értékelésének zavarai (alul vagy éppen túlértékelésük), az ESG standardeknek való meg nem felelés, vagy a szakok fejlesztésének problématikáját jelentik. A szakfelelősök szerepe megkerülhetetlenül fontos – pontosan meghatározva a velük szemben támasztott követelmények sem minden szempontból állnak rendelkezésre.

A tanulmányunkban kérdőíves felmérésünket elemezzük, illetve a szakfelelősi minőségfejlesztési kérdéseket vesszük végig – a teknősdiagram segítségével.

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Effects of heat stress on chicken-derived primary hepatic cell culture models

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Heat stress is one of the major stressors in chickens; however, the exact cellular mechanisms are not yet completely described. The aim of our study was to investigate the effects of heat stress and its interaction with inflammation on cellular level in chicken liver.

Cells were freshly isolated from the liver of 21-day-old Ross 308 broilers by multi-step perfusion and differential centrifugation. Hepatocyte mono-cultures and hepatocyte – non-parenchymal cell (mainly Kupffer cell) co-cultures were prepared, the latter mimicking hepatic inflammation. Cells were cultured either at 38.5oC (control) or were exposed to 43oC (heat stress) for 1 or 2 h. To investigate metabolic activity, CCK-8 assay was carried out. The concentration of H2O2 was assessed by Amplex Red method and heat shock protein 70 (HSP70), interleukin- (IL)-6 and IL-8 concentrations of culture media were measured by ELISA kits.

Metabolic activity was significantly higher in co-cultures than in hepatocyte mono-cultures. Further, the parameter was intensely affected by heat stress in both of the models after both incubation time. Shorter, 1 h long heat exposure increased extracellular H2O2 release, while HSP70, IL-6 and IL-8 production were significantly decreased. However, all these alterations were normalized after 2 h heat stress, assuming an effective adaptation and restoration of liver cells.

Our newly developed primary cell culture models provide proper tools for studying the hepatic response to heat stress. The intense negative effects of heat stress considering cellular metabolic activity as well as oxidative and immune status of the cell cultures can be concluded. The results of our study highlight the effects of short term heat stress on liver-derived cell types and suggest an efficient cellular adaptation mechanism in liver cells.

The study was supported by the EFOP-3.6.3-VEKOP-16-2017-00005 grant and by the NKFIH grant no. 124586.

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Relationship between the number of food-borne diseases and climate change in Hungary

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Our research aims to discover the possible correlation between climate change and food-borne diseases. The Hungarian Meteorological Service provided data from CarpatClim database for 10 climate parameters for the computations. The National Health Service provided the data of food-borne diseases for the period 1961-2010. This was correlated to the 10 climate parameters as predictors and backward elimination method for multiple regression was applied. At 5% significance level there is significant correlation between the annual number of food-borne diseases and the annual mean temperature (this relationship is negative, that could result from the tendencies of the time series of the varaibles). Determination coefficient was low (23%), therefore the dataset was split in two parts (25-25 years), and it can be seen that the effect of the annual mean temperature became significant in the second part of the examined time period. Because of this reason we examined the last 30 years of the time period (1981-2010) as 30 years are the minimal interval for climate researches. R2 (determination coefficient) increased to 34%, and the only significant prdictor was the annual mean temperature at 5% significance level. In case the significance level would be fixed at 10%, the five-days precipitation maximum (RX5) remains also as a significant predictor and R2 increases to 43%. The diagnostic check and the control of preliminary requirements of the multiple regression were checked and fulfill the requirements.

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Hazánkban publikált egészség-gazdaságtani szakirodalom többnyire makroszintű, az egészség-gazdaságtan és technológiaelemzés lehetőségeiből nagyon keveset használunk mikroszinten.

Az egészségügyi döntések meghozatalában orvosszakmai szempontokon kívül, pénzügyi-gazdasági megfontolások is szerepet kell, hogy játsszanak, hiszen az erőforrások szűkösen állnak rendelkezésre az egészségturizmus területén is. Gyakorló orvosként naponta találkozunk azzal a problémával, hogy a részünkre „biztosított" eszköztárat maximálisan – ugyanakkor nem mindig feltétlenül optimálisan - használjuk fel. A kutatás során a célkitűzés az egészségturizmusban használatos kezelések hatékonysági vizsgálata volt, valamint javaslatok megfogalmazása makro és mikro szinten a költséghatékonyabb működtetése érdekében.

A szerző a Hévízgyógyfürdő és Szent András Reumakórház fizioterápiás kezelések kiírási gyakorlatának hatékonysági elemzését végezte el 2014 és 2019 között.

A kutatás első részében a medikai informatikai rendszerben tárolt adatok alapján elemzésre kerültek a betegforgalmi adatok, a betegösszetétel, a rehabilitáció eredményessége.

A kutatás második részében a fizioterápiás kezelések kiírási gyakorlatának egységesítése és racionalizálása érdekében megoldási és intézkedési terv került kidolgozásra és ezen új fizioterápiás szabályzók szerinti működés egy éves adatai kerültek elemzésre.

Megállapítást nyert, hogy az intézmény különböző részlegei hasonló betegszámot, hasonló betegség összetételben, hasonló eredményességgel kezelnek - ugyanakkor jelentős különbség volt a részlegek által kiírt fizioterápiás kezelésszámban.

A fizioterápiás szabályzók bevezetése utáni egy éves periódusban a korábbi 4 év számított átlagához képest 37 502 db fizioterápiás kezelés megtakarítás történt, az eredményességi mutatókban nem volt szignifikáns változás, a hatékonysági ráta 10,47%-al emelkedett.

Mikroszinten is van lehetőség az orvosi terápiás gyakorlatot szabályozó intézkedésekkel jelentős költségcsökkentést, hatékonyságjavulást elérni a gyógyításban ugyanolyan eredményesség mellett.

A műhelymunka jó gyakorlatként jellemezhető és kiterjesztése, alkalmazása javasolható más, az egészségturizmusban résztvevő szervezetek, intézmények számára is.

Tamás MESTER[1] - Dániel BALLA[2] - György SZABÓ[3]

Investigation of the suitability of groundwater for irrigation in village environment

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As climate change is accompanied by an increase in the length of droughts in urban areas, there is a growing demand from the local population for irrigation with groundwater. However, the groundwater resources of the plain areas in Hungary are not always suitable for irrigation due to their high solute content and anthropogenic pollution. In the present study, we examine groundwater on the example of a settlement in the Great Hungarian Plain based on its suitability for irrigation.

In the summer of 2018 and 2019, samples were collected from 40 groundwater wells. After determining the macroelement content of the water samples. The salinizing effect of groundwater was evaluated based on the Na% and Sodium Adsorption Ratio (SAR). In 2019, we experienced negative changes compared to the previous year, 82.5% of the samples shifted to the "high" range of over 70% of Natrium, which means that the samples are unsuitable for irrigation. 17.5% of the samples were in the medium category. SAR and EC values were plotted on a riverside diagram. Based on the Gibbs diagrams showing the relationship between TDS and (Na+K)/(Na+K+Ca), we found that the largest effect on groundwater cation ratios is exerted by evaporation. Irrigation water classification according to Wilcox (1955) was also performed based on Na% and electrical conductivity. It was found that 32.5% of the samples fell into the "excellent-good" categories and 67.5% into the "poor-unsuitable" categories.

Based on our results, it can be stated that although irrigation with shallow groundwater would be necessary during summer, at the same time irrigation also caused a number of negative effects, such as secondary salinization, which inhibits the inhabitants from irrigation.

Nóra MEZŐFI[1] - Kornél NÉMETH[2]

Corporate aspects of the European Union's action plans for the circular economy

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The European Union's circular economic model aims to preserve and maintain the value of everyday products, materials and resources for as long as possible, while minimizing waste. The mindset has a central role in the Union's efforts to increase its global competitiveness and to help green business opportunities and consumption patterns. In this study, we review the business-related elements of the Union's action plans and progress reports on the circular economy, and thematize the diversified aspirations of development ideas that are still taking shape today. Related to the previous ones, we collected 800 best practices carrying elements of the circular model in the first half of 2020. The practices mapped on the global stage were classified according to both sectoral and other thematic approaches highlighted in EU development documents. The aim of the research is, partly, the scientific analysis of the corporate aspects of the EU development documents concerning the circular economy and, in accordance with this, the exploration and categorization of the business development directions regarding the issue. Today, the future tasks of the principles of the circular economic model affecting companies seem to be clearly outlined, which, of course, also affect a significant part of the domestic corporate sector. Based on our extensive data collection, we can be say that quite a few organizations have recognized the benefits of using resources on a circular basis. We also consider it important to raise awareness in certain affected segments of the Hungarian corporate sector about the direction and rate of changes that are necessary to fulfil the EU criteria regarding the issue at the national level.

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Population genetics of the fallow deer (Dama dama) in Tolna county

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Fallow deer is one of the most important game species in Hungary. Its trophy quality is one of the best in the world, the current world record and 4 more of the 10 trophies with the highest scores come from Hungary too. Nearly ¼ of its population lives in game preserves, which assumes low genetic diversity. In addition, a rate of infection with a relatively new disease called antler rot is increasing within the population, whose genetic background is still unclear.

The aim of the survey was the genetic study of fallow deer in Tolna county using a microsatellite marker set containing 10 markers, which was originally developed for red deer and adapted to fallow deer. A total of 114 samples from different areas were succcesfully examined and comparative analyses were performed based on the following aspects: individuals from game preserves and open area, individuals from Tolna county and control region, males and females and infected and healthy deers.

The genetic diversity of fallow deer is extremely low, with an average of 2.78 alleles per locus, also monomorphism was detected in an allele. Based on the heterozygosity indices the groups were slightly outbred, except the group lives in game preserves, where 5 out of 9 loci showed a significant differentiation from Hardy-Weinberg equilibrium in the direction of inbreeding. In addition no significant differences could be detected between the groups, so the genetic background of the antler rot could not be revealed. However a red deer marker set proved to be suitable for fallow deer with almost 100% efficiency after adaptation.

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Legal and institutional background of higher education quality assurance changes and effects of the XXI. at the beginning of the century

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The emergence of quality culture in higher education has a relatively recent history, but its role and significance has gradually increased in value over the past decade. It is also an indisputable fact that quality assurance is playing an increasingly important role in assessing the competitiveness of higher education institutions and gaining ground in the international higher education market and rankings.

For many, the system of criteria that determine the quality of higher education and the institutional system that can be linked to it is not completely transparent, and its formation and development process is unknown. At the same time, the behavior and attitudes of higher education actors towards quality assurance would be positively influenced if these processes and circumstances were more widely known.

In our works, we aim to present the system of legal regulators determining the quality of higher education operational mechanisms, as well as the operation of the institutional system supervising and coordinating it and its guidelines.

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A búza az egyik legjelentősebb hazai kultúrnövény és az egyik legfontosabb gabonaféle. A felhasználási köre tág, nemcsak kulcsfontosságú élelmiszerek készülnek belőle, hanem a takarmányozásban is széles körben használt. A termelés piaci versenyképességének a legfontosabb mérőszáma a termésátlag, ami erősen ingadozik az egyes évek között. Az értékesítés oldaláról pedig az ár határozza meg a termelés eredményességét. A cikk célja ezek bemutatása az elmúlt 10 év adatainak a segítségével, valamint a kapott eredmények alapján agrárpolitikai ajánlások megfogalmazása.

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MOLNÁR Tibor János

Kontinuitás a magyar vízügyi politikában: a Horthy-korszak tervei és azok megvalósulása a második világháború után

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A 19. századi Tisza-szabályozás számos probléma megoldása mellett újabbakat, sőt súlyosabbakat is generált: ilyen volt például a rendkívüli árvizek és aszályos időszakok váltakozása, amely elsősorban a Tiszántúl mezőgazdaságát sújtotta. A korrekció igénye már az 1863-64-es, éhínséget okozó tiszántúli aszály, majd 1879-es szegedi árvíz után is felmerült, de érdemben csak a trianoni békével a tiszai vízgyűjtő terület legnagyobb részét elvesztő, immár önálló Magyarország kormányzata és vízügyi szakmai elitje vállalkozott ennek a kihívásnak a kezelésére.

A Királyi József Műegyetemen végzett vízmérnöki kar egymást követő nagy alakjai (pl. Sajó Elemér, Rohringer Sándor, Lampl Hugó) az 1930-as évek elejére tudományos igényű javaslatot is kidolgoztak a folyószabályozás káros következményeinek kezelésére, érdemi politikai támogatást viszont csak az évtized vége felé kaptak Horthy Miklóstól, aki tiszántúli birtokai révén személyesen is érdekelt volt a gyakorlati megvalósításban. A kormányzó mellett a későbbi miniszterelnök Kállay Miklós volt az 1937-ben megszületett öntözési törvény fő ösztönzője és végrehajtásának támogatója. A II. világháború nem tette lehetővé a tervek maradéktalan megvalósítását, azonban az 1945 utáni vízügyi vezetés nem nélkülözhette a Horthy-korszak mérnökeinek szakértelmét, ezért a szovjet tudomány hatását erősen magukon viselő Országos Vízgazdálkozási Kerettervekben tovább éltek az öntözési törvény alapelvei, valamint a később megvalósult nagylétesítményeknél (tiszalöki és kiskörei duzzasztómű, főcsatornák) is tetten érhetőek a korábbi politikai rendszer vízügyi elképzelései.

Napjainkban a klímaváltozás következményeihez való alkalmazkodás új megvilágításba helyezi a Tisza-völgy integrált vízgazdálkodásának kérdését, amelyben a nyers gazdasági érdekek mellett az ökológiai szempontok is egyre hangsúlyosabb szerepet kapnak. A 2019. évi CXIII. – az öntözéses gazdálkodásról szóló – törvényben pedig visszaköszönnek Sajó Elemér, Rohringer Sándor és Lampl Hugó máig aktuális gondolatai.

MOLNÁRNÉ BARNA Katalin[1] - MOLNÁR Tamás[2]

Az agrárágazat helyzete, tendenciái és területi aspektusai hazánkban

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Hazánk - adottságai alapján - agrárjellegű ország. A termő- és szántóterület aránya alapján az Európai Unió országait tekintve az elsők között vagyunk. Azonkívül az éghajlati viszonyok (napsütéses órák száma, csapadék) is kedvezőek, ami szintén erősíti az ország agrárjellegét.

A mezőgazdaságból élők aránya a rendszerváltás után, ugyan folyamatosan csökkent, de az agártermelés jelentős szerepet vállal az ország élelmiszer ellátásában, a GDP termelésében, illetve a kedvező export-import egyenlegben. A cikk szerzői áttekintik a rendszerváltás utáni évtizedek alatt végbement változásokat az ágazatban, bemutatva a főbb tendenciákat.

Hosszú idősorokat elemezve bemutatják az agrártermelés alakulását, a művelési ágak arányváltozásait, a szektorban tevékenykedők létszámának alakulását, a mezőgazdasági beruházások volumenét, az agráriumban dolgozók bérének alakulását, valamint ezek régiós (NUTS 2.) különbségeit.

A főbb megállapítások a következők: Mezőgazdasági hasznosítású földterület nagysága csökkent az elmúlt évtizedekben. Mezőgazdasági termékek termelése szintén visszaesett, de ez a belföldi fogyasztást nem veszélyeztette. Termelékenység, gépesítettség jelentősen növekedett. Alkalmazásban állók létszáma és aránya folyamatosan csökkent. Ágazat kettős nyomás alatt van: egyrészt jellemző az elöregedő munkaerő, másrészt gondot jelent az idénymunkák megszervezése. A teljes munkaidőben alkalmazásban állók bére az országos átlagot nem éri el. A szektor GDP-ből való részesedése folyamatosan csökken.

Orsolya Bernadett NAGY[1] - Péter BALOGH[2] - Lajos NAGY[3]

Comparison of consumption and purchasing habits among university students for industrial pig and mangalica pig

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The purpose of the study is to compare preferences for buying and consuming industrially kept pork and mangalica pork among students at the Faculty of Economics, University of Debrecen. Data were collected through an online questionnaire. Descriptive statistical methods, Chi-square tests, Mann-Whitney and Kruskal-Wallis tests, and Spearman rank correlation tests were performed to analyze the data obtained from the survey. All fillers tend to consume pork, but only 37.3% also consume mangalica. Most of the respondents buy at a butcher. From the aspect of purchasing, freshness, the ingredients of the product and the domestic product were considered to be the most important in the case of industrially kept pigs and mangalica, and in the case of mangalica, the proven product proved to be very important. Among the factors taken into account in the purchase, in the case of industrially kept pigs, there is a weak to medium positive correlation, with the highest values being found between healthy diet and fat content, and presentation / packaging and manufacturer / brand. In the case of mangalica, the correlation is positive and close for all factors, with the highest values being between freshness and the ingredients of the product and between the proven product and the ingredients of the product.

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Péter Tamás NAGY[1] - Luca KAPUSI[2] - Florence TÓTH[3]

Investigation of the effect of nutrient supply products based on poultry manure by soil incubation method

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The appropriate amount and quality of soil organic matter is an essential criterion for adequate nutrient management practices linked to the challenges of the age. The organic matter content of Hungarian soils has been significantly reduced at several places in the last decades. Its proper replacement is a problem for many farmers due to the declining livestock manure and intensifying animal husbandry. However, the large amount of manure produced by intensive poultry farming cannot be applied directly, but fermented and added, it is an excellent solution for increasing the organic and nutrient content of the soil. In our studies, the effects of fermented and pelleted poultry manure products were investigated by soil incubation experiments - at different water capacity - on meadow chernozem soil. The experiments were continued for one month. Repetitions of treatments were terminated week by week in order to obtain continuous information about the processes of the soil. At the end of the experiment, soil samples were taken from two depths of the pot and, after appropriate sample preparation, the pH of the samples was measured by electrochemical method, while the ammonium and nitrate content of the samples was measured by photometric method.

From our results, it can be concluded, that applying products not showed a significant affect in pH of the soil of the studied layers, regardless of the water capacity levels. Compared to the control, each of the applied products increased the content of both ammonium and nitrate in the soil. The increase of nitrate concentration in all treatments exceeded the increase of ammonium content of the soil. It was found that the amount of ammonium-N form changed less than the nitrate concentration in the different soil layers. Moreover, the soil moisture levels are also affected the ratio of nitrogen forms.

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Investigation of the effects of humic and fulvic acid-based plant conditioning preparations on plant regeneration in 'Cabernet franc' grape variety

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The use of brown coal with high humic acid content, lignite and similar organic minerals as soil improvers and plant fertilizers dates back to a few decades. Humic acids and fulvic acids play a very important role in nutrient management and physiological processes of plants. These elements contribute to carbon dioxide and oxygen exchange, as well as to the uptake and excretion of toxic compounds. Besides, they improve the activity of themicrobial life in root zone. Their biological effect is wide-ranging: they increase the intensity of photosynthesis, accelerate cellular respiration processes, as well as they increase the activity of enzymes which play an important role in the physiological processes of the plant.

In 2017, a three-year experiment was set with dispensed plant conditioner and foliar fertilizer products (Kondisol, Solvitis) of the Huminisz Kft. in a 1 ha 'Cabernet franc' vineyard at the NARIC Research Institute for Viticulture and Enology in Badacsony, Hungary. In 2020, this experiment was complemented with mechanical and handcrafted foliar tearing experiment to test the after stress regeneration ability of the plants.

Based on the preliminary studies, it can be said that the treatments compiled by Huminisz Kft had a positive effect on the regeneration of the plants.

Marietta NÉMETH

Possibilities of measuring guest satisfaction as a key performance indicator in the hotel industry

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Tourism has a special role in the Hungarian economic sector as well, in this field the several accommodation providers - especially hotels - have a relevant function. In order for a business to be viable and operationally successful within the current circumstances, it is extremely important to define and regularly monitor each key performance indicators. The author's research focuses mainly on the collection of data in the international literature, especially on the presentation of guest satisfaction as a concept and as a measurable success factor. For example the application of the so-called H-CSI model, which is a satisfaction measurement methodology tailored to the hotel industry within the service sector, is preferred in reseatch studies internationally. The aim of this paper is to review the methodologies in the literature, to determine their advantages and disadvantages, and to summarize the conditions of applicability.

A hotel can only be successful if it contributes to guest satisfaction through the creation of quality services, and the aggregation of the literature attempts to do so.

Máté ÖRDÖGH

The effect of Pentakeep-V, Kelpak and Ferbanat L biostimulators on morphological and physiological characteristics of micropropagated Hosta 'Dew

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An attractive, white patterned dwarf plantain lily cultivar (Hosta 'Dew Drop') was multiplied on half-strength Murashige and Skoog (1962) "MS" medium with 20 g l-1 sucrose, 5.5 g l-1 agar and 4 dozes (0.1-0.8 ml l-1) of Pentakeep-V, Kelpak and Ferbanat L (the control medium was not contained biostimulators). After three months, in vitro plants were examined and acclimatized in greenhouse on 50-50% peat-perlite mixed soil (in this case, only after-effects of biostimulators were analysed because none of these agents were used during this last micropropagation phase). Further three months later, acclimatized (and survived) ex vitro specimens were also investigated according to the following parameters, similar as in case of the in vitro plants.

Number of shoots and roots

Length of the longest shoot and root (mm), length and width of the longest and widest leaves (mm)

Total plant fresh weight (g)

Chlorophyll (a+b) contents and peroxidase enzyme activity (U/mg) of leaves (µg/g)

As compared to the control, all biostimulators increased the number of shoots of both in vitro and ex vitro plants. During in vitro propagation, 0.1 ml l-1 and after acclimatization, 0.4 ml l-1 Ferbanat L was the best for shoot development, 5.23 and 3.91 shoots were found. Higher (0.4 and 0.8 ml l-1) concentrations of Pentakeep-V and Kelpak has similar effect.

All in vitro plants spontaneously produced roots, however, most cases, not significant differences were observed between the biostimulators and only 0.1 and 0.2 ml l-1 Pentakeep-V resulted more (26.76 and 24.55) roots than the control (22.88). Furthermore, this product strongly decreased the length of roots (from 79.09 to 34.78 mm) when higher doses were applied.

If we compared leaf sizes on the control and biostimulators, those acclimatized plants developed longer and wider leaves which were grown on medium with Ferbanat L and Kelpak (in all concentrations). It is worth notify that in vitro plants have much smaller (generally half-sized, no longer/wider than 17/9 mm) leaves than ex vitro (acclimatized) specimens with larger ones (mostly longer/wider than 30/17 mm).

The longest in vitro and acclimatized shoots (26.45 and 52.91 mm) were found when 0.4 ml l-1 Ferbanat L was used. Kelpak similarly resulted significantly longer shoots than the control, but only after acclimatization. Pentakeep-V has negative impact to the shoot length, especially in case of higher doses (the maximal length was only 34.27 mm). Due to the highest shoot number and length, 0.4 ml l-1 Ferbanat L resulted the largest fresh plant weight (2.93 g, almost twice as in case of the control: 1.65 g).

For in vitro plants' chlorophyll content, 0.8 ml l-1 Kelpak was optimal (with the highest value: 2925,3 µg/g), but as after-effect after acclimatization, lower concentrations were better, especially when 0.1 ml l-1 was added to the medium before this stage (2548,7 µg/g). In the latter instance, significantly the highest peroxidase enzyme activity (0.169 U/mg) was detected in the successfully acclimatized specimens (close results were found in case of 0.8 ml l-1 Ferbanat L and the other Kelpak doses). Higher levels of Pentakeep-V enhanced peroxidase activity during in vitro propagation (and after acclimatization, lower values were observed if we compared with the other groups).

Considering morphological and biochemical parameters, Kelpak and Ferbanat L were more effective than Pentakeep-V, and economically favourable lowest (0.1 ml l-1) concentrations resulted stronger, massive, higher plants with larger leaves.

Bálint PACSAI[1] - Bence FÜLÖP[2] - Judit BÓDIS[3]

Protected species on the shore of the Lake Balaton at Fenékpuszta

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The shores of Lake Balaton in Fenékpuszta represent a significant natural value, are part of the Natura 2000 network and some parts enjoy national protection. It is best known for its bird ringing station, but based on previous data it is also very valuable from a floristical point of view. Our goal was to explore how much of the area has preserved its botanical values.

The examined area is bordered to the north by the stream Csókakői to the south by the river Zala, to the west by the railway track, and to the east by Lake Balaton. The survey of protected plant species lasted from September 2018 to July 2020. In our work we also used the observations of Szabolcs Benke and Anikó Benke.

The area is home to a sticktly protected plant species, the early spider-orchid (Ophrys sphaegodes), which has a stable population there. Of the other eight species of orchids, the woody-shrub areas, Cephalanthera damasonium, C. longifolia, are mainly found in the northern part, in addition to Epipactis tallosii and Neottia nidus-avis. In the northern part, in a mesotrophic meadow environment, there are Dactylorhiza incarnata and Anacamptis elegans. In both the northern and southern parts, Orchis militaris and Neottia ovata grow. In the southern part, there are large colonies of Acorus calamus, with several stands of Samolus valerandi and Equisetum variegatum). Allium carinatum and Ranunculus lingua occur in only one spot. Trapa natans grows in the open-water bays of the reeds, while Cicuta virosa and Nymphaea alba grow in the firth of the river Zala. The appearance of protected species is typical where the area is mowed or grazed. It would be necessary to extend the aera affected by treatments to restore the habitats and reduce the pressure of the invasive plants.

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A duális képzés tapasztalatai egy felsőoktatási intézmény duális gyakorlatában

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Tanulmányunkban a duális képzés tapasztalatait foglaljuk össze a Pannon Egyetem Gazdálkodási Kar Zalaegerszeg (korábban Budapesti Gazdasági Egyetem Gazdálkodási Kar Zalaegerszeg) gyakorlata alapján. A duális képzés pilot bevezetése óta (2014. szeptember) eltelt időszak sok tapasztalattal, felismeréssel, előzetesen nem várt problémákkal és rengeteg sikerrel is szembesített bennünket. A 2015. év szeptemberétől már akkreditált formában zajló a duális képzés értékelését részben szekunder adatok alapján végezzük, részben primer adatgyűjtésre alapozzuk. Vizsgálataink fókuszában az alábbi kérdések állnak: Mennyire tartják eredményesnek a végzett duális hallgatók a duális képzést? Mennyire múlik a duális képzés eredményessége a mentor-hallgató viszony alakulásán? Milyen erősségei és gyengeségei vannak a duális képzésnek? Milyen lehetőségei és veszélyei vannak a duális képzésnek? Kutatásunkban levonjuk tapasztalatainkat a képzés gyakorlati megvalósulására vonatkozóan és megfogalmazzuk a jövő duális képzésének alakításához kapcsolódó javaslatainkat.

PENKSZA Károly[1] - PÁPAY Gergely[2] - CSERHÁTI Péter[2] - BARACSI Éva[3]

Festuca taxonok potenciális kertészeti alkalmazhatósága

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Az alföldi homoki területen előforduló Festuca taxonok közül előzetes elképzeléseink és kutatásaink alapján a Festuca wagneri tűnt legalkalmasabbnak arra, hogy a kertészeti gyakorlat számára is alkalmas klegyen. A Festuca wagneri cönológiai helyzetére vonatkozón Pócs Tamás tett megállapításokat és a homoki sztyepprét fajaként tartott nyilván. A faj állományait elsősorban szintén a Kiskunság területén találhatjuk meg. Ezeket a vizsgálatokat megerősítettük és a záródó és az erdős sztyepp foltok területen is előforduló taxonként értékeltük. Ez alapján a széles skálán alkalmazható fajt arra alkalmasnak ítéltük, hogy a meglehetősen száraz város klímában is felhasználható. Ezen túl az is kérdés volt, hogy lehet-e tipizálni az egyes egyedeket.

Összesen 90 tő Festuca egyedet 2018-2019-ben szállítottunk a Pannon Egyetem Georgikon Kar Kertészeti Tanszék kísérleti területére és szabadföldbe és cserepezve is el lettek helyezve. A szállított Festuca egyedek előzetes megfigyelés alapján két taxonhoz tartoztak. A Festuca wagneri mellett az Újpesti Homoktövis Természetvédelmi Terület újonnan felfedezett taxonja volt, ami hasonló környezeti viszonyok mellet és degradáltabb területen vált tömegessé.

A két vizsgált taxon is elvált egymástól és változatosnak a Festuca wagneri egyedek tűntek. A F. wagneri 45 egyede közül, egyrészt tőzeges, illetve tőzeg és perlittel kevert közegbe ültetett tövek közül 4 csoportot tudtunk elkülöníteni. A Festuca wagneri egyedek közül a több típust választottunk ki, amely a kertészeti gyakorlat számára alkalmas látványos díszfű lehet. Ezeket a következőként neveztük el, illetve jellemeztünk. 1: A levelei és a virágzata is sűrűn felálló. 2: A virágzati hajtások széthajlanak. 3: Alacsony „törpe", tömött, sűrű, de alacsony növésű. 4: Nagyon magas, szétterülő bugával és a különleges érdekessége, hogy a nóduszokon lilás, antociános szín jellemző. A vizsgált egyedek morfológia és szöveti vizsgálatok alapján is elkülönültek. Ezek a típusok a kertészeti igényeknek megfelelően alkalmazhatók lehetnek.

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Lawn regeneration results of the conservation management on the homoktövis conservation area in Budapest

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In Budapest, despite the density of the population, precious plant communities still remain in a lot of, mostly isolated fragments of habitats which – especially sandy lawns – are outstanding in the diversity of species and are rare inhabitants of endemic species. On the examined territory, since 2006 long term reconstructions of the habitats have been ongoing which strive for the decrease of the invasive woody species on the territory and the insurance of the habitat of the sandy lawn, as well as the long term conservation of the fragments of the lawn and the creation of the natural sandy lawn.

This activity is conducted by the volunteers of the MME and with the help of the students of educational institutions in parallel requesting for the permits of the Municipality of the Capital. During these interventions, the shoots were mechanically beat down and they were wiped dried as well.

Besides these interventions, it was fundamental to preserve the sensitive, rare or legally protected species and to increase their volume as much as possible. The planning of the treatments and interventions were conducted from the existing areas of seeds gradually towards their outside, taking into special account that not too much surface should be open at the same time during an intervention in order to prevent the fast expansion of the invasive species and species of the weeds.

The effects of the interventions on the vegetation were conducted on 7 sample areas, on 10-10 quadrats by examining the coenological entries, therefore we were able to provide the effects of the reconstruction of the habitats 14 years retrospectively. During the past years, due to the systematic planning on the fragments of the habitats, 9 hectares of new surface could be opened. Due to this, more than 40% of the entire protected area could become an area of lawn. To better understand the changes, we demonstrated them on a map and we compared with the soil science data of this surface.

In the central part of the area where there has always been natural, open sandy lawn, the dominant species of grass is Festuca Vaginata. However, in the areas of killed shrubs, the dominant species of Festuca was the Festuca pseudovaginata. It was especially outstanding that for the science a new species of Festuca has been revealed which scientific description is under progress. The work has been supported by OTKA K-125423 and Gödöllő Nature Research Association.

Dariusz PIWCZYŃSKI[1] - Magdalena KOLENDA[1] - Beata SITKOWSKA[1] - Branislav GÁLIK[2] - Jan GONDEK[3]

The concentrate feed system and the milking parameters in barns equipped with an automatic milking system

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The key factor determining the profitability of production on a farm equipped with an automatic milking system (AMS) is the milk yield per milking robot. This, in turn, depends on the number of cows per robot, their milk yield, milking speed and the time a cow spends in the milking box. In the case of high-yielding cows, consuming a large amount of concentrated feed may extend the time they stay in the milking box. For this reason, the installation of feeding stations (FS) in a barn with AMS may turn to be an economically viable solution. The aim of the study was to compare selected parameters of milking (daily rates per cow) recorded by AMS in barns equipped with FS (2 barns) and barns where cows consumed concentrated feed only in the milking stall (2 barns). The study included a total of 780 PHF cows in their first to third lactation. The following parameters were evaluated: milking frequency (MF, no./24 h), number of rejected (NR, no./24 h) and unsuccessful milkings (NF, no./24 h), average number of attempts (AN, no./milking), time needed for milking machine to attach to the udder (AT, s/milking), milking time (MT, s/24h), milking speed (MS, kg/min.), time spent in the milking box (BT, s/24h), milk yield (MY, kg), milking efficiency (ME, kg/min.) (calculated as MY/BT), rumination time (RT, min./24h). Statistical analysis was performed using a multivariate analysis of variance and a mixed linear model. The statistical influence of the concentrate feed systems on most of the controlled traits was found, except for MY (FS – 34.31 kg; without FS – 34.07 kg) and RT (FS – 449 min; without FS – 456 min). Compared to cows fed only in milking stall cows in barns with FS were characterized by higher values for the following parameters: NR (2.36 in FS vs 1.73 without FS), MF (3.05 vs 2.84), ME (1.79 kg/min vs 1.71 kg/min), MS (2.91 kg/min vs. 2.68 kg/min), as well as lower values for AN (1.36 vs. 1.50), NF (0.08 vs. 0.09), AT (11.0 s vs. 14.1 s), MT (788 s vs 847 s) and BT (1227 s vs 1275 s). The present study allows to conclude that the use of feeding stations in combination with AMS allows to increase the milking efficiency and the milk yield from the milking robot.

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Heritability and genetic correlation between rumination time and some milking traits in Polish Holstein-Friesian cows milked in automated milking system

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So far, rumination time has been used primarily as an indicator of the quality of the supplied feed and the health status of cows, it was also used to detect heat and forecast the date of calving. Therefore, it was useful when making decisions regarding herd management. Understanding the genetic parameters of rumination time would probably create a new criterion for the selection of dairy cattle. The aim of this study was to estimate heritability and genetic correlation among rumination time (RT) and selected milking traits for 1 836 primiparous Polish Holstein-Friesian cows from 25 farms equipped with an automatic milking systems (AMS, Lely Astronaut A4) in Poland. The following data from AMS-data recording system were chosen for analysis: daily milk yield (MY, kg), milking frequency (MF, no/24h), number of refusals (NR, no./24), milking time (MT, min./24h) and milking speed (MS, kg/min.), box time (BT, min./24h), electrical conductivity (EC, mS/cm) and milk temperature (MTEMP, oC). Additionally, the following traits from the SYMLEK – official milk recording system were extracted (test day): fat (FC, %), protein (PC, %), lactose (LC, %), dry matter (DM, %), urea contents (MU, mg/l) and somatic cell counts (SCC, thous/ml) in milk of studied cows. Data from AMS were restricted to those related to test days with available data for milk composition and SCC. Before analysis, SCC was log-transformed to obtain normally distributed somatic cell score using formula: SCS = log2(SCC/100 000)+3. Finally, 11 660 records were used for estimation of covariance components. Genetic parameters of the studied traits were estimated using Bayesian method via Gibbs sampling and two-trait random regression animal model with fixed effect of herd x test-day, fixed regressions on days in milk (DIM) nested within age at calving by season of calving and random regressions for additive genetic and permanent environmental effects. Both fixed and random regressions were fitted with fourth-order Legendre polynomials on DIM.

The estimated RT heritability was low, ranging from 0.040 to 0.199 depending on the day of lactation. The average RT heritability, based on the consecutive 305 days of lactation, was 0.068. Genetic correlations (averaged daily rates) between RT and the other controlled depending on the lactation phase (5-100, 101-200, 201-305 days) varied widely and amounted to correspondingly: MY – 0.290, 0.527, 0.220; MF – 0.207, 0.165, 0.145; NR – (-0.104), 0.216, 0.187; MT – 0.073, 0.347, 0.241; MS – 0.038, 0.158, 0.080; BT – 0.226, 0.206, 0.338; EC – 0.197, 0.532, 0.638; MTEMP – 0.380, 0.150, (-0.154); FC – 0.171, 0.189, 0.169; PC – 0.119, 0.138, 0.081; LC – 0.118, 0.038, 0.030; DM – 0.220, 0.179, 0.112; MU – (-0.163), (-0.635), (-0.002) and SCS – 0.268, 0.473, 0.326. Despite the low heritability of the rumination time, it is worth considering this feature in the breeding program for dairy cattle due to the positive correlation with some milking traits.

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Multilingualism and agricultural journal

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Available electronic technologies create new fields of publishing through lower costs, lower limits to the length of papers, supplementary materials (data, graphics, maps and video), greater availability and easier access to more people from remote places. In this context, Journal of Central European Agriculture (JCEA), an online multidisciplinary scientific journal in agriculture has been founded in 1999 by three universities from Croatia, Hungary and Slovakia. Besides sharing problems and solutions in the region, the idea behind Journal was to keep and develop national languages and identities. So, JCEA seeks to combine such contradictory problems in one unifying electronic agricultural journal. Not less important intention is to ease the demand on the present West European journals in agriculture, and to give opportunity and encouragement to Central European scientists to publish faster. The multilingual strategy of the journal accepts the world intention to preserve and support the development of national languages. Currently nine universities from nine Central European countries cooperate in publishing JCEA. Each university organizes national editorial board with task to verify articles in its national language and to participate in reviewing. JCEA publishes articles, written in national language of any of the nine member countries (Bulgarian, Croatian, Czech, Hungarian, Polish, Romanian, Serbian, Slovak and Slovenian), regularly referenced in reputable index databases (WoS Core Collection, Scopus, CAB Abtracts, EBSO, etc.). However, in order to enable international review as well as dissemination of the research results to broader audience, manuscripts written in member countries national languages must have manuscript title, abstract, keywords and detailed abstract written in English. Author(s) can submit manuscripts written in English language accompanied with the manuscript title, abstract, keywords and detailed abstract in national language.

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Impact of inframammary infection and non-infection factors on somatic cell count in sub-Mediterranean dairy ewes

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The aim of the study was to determine the effect of inframammary infection and non-infectious factors such as the parity and stage of lactation on the somatic cell count (SCC) in ewe's milk. The study included 111 Pag sheep (from 2nd to 4th lactation) - an indigenous Croatian breed that is traditionally bred on the Island of Pag. Three times during lactation, i.e. once in early (<60 days), middle (61-120 days) and late lactation (>121 days), one sample of milk was taken from each mammary gland for the purpose of microbiological examination, and also one sample for determination of SCC. A total of 626 milk samples were aseptically collected for the purpose of microbiological examination of milk, and the same number of samples for the determination of SCC. The number of somatic cells in milk was determined by the fluoro-opto-electronic method. The geometric mean SCC value of all analyzed milk samples was 102x103/mL, with SCC being significantly higher in milk obtained from infected mammary glands than in milk from uninfected udder halves (1 858: 91x103/mL, respectively). Ewes with unilateral and bilateral udder infection had significantly higher mean SCC than ewes with no udder inflammation, although no statistically significant difference in SCC was found between ewes with bilateral and unilateral udder infection. SCC in milk obtained from udder halves infected with microorganisms from the group of so-called the major pathogen was significantly higher than in milk from mammary glands infected with minor pathogens, while the highest geometric mean SCC was caused by mammary gland infections with Staphylococcus aureus (5 754x103/mL). With increasing of parity, a significant increase in SCC was found in milk from healthy udder halves, while no significant changes in SCC in milk from infected mammary glands were found due to increased parity. In parallel with the lactation progression, a significant increase in SCC was found in milk obtained from healthy mammary glands.

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A nitrapyrin hatóanyagtartalmú nitrogén stabilizátor hatékonyságának vizsgálata a talajhőmérséklet függvényében

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Napjainkban a fokozott nitrogén utánpótlás ellenére még mindig gyakran szembesülünk a súlyos nitrogénhiány tüneteivel egyes szántóföldi növények esetében. A különféle nitrogénformák felvehetőségének biztosítása (különösen a növények legintenzívebb fejlődési fázisában) fokozott jelentőséggel bír.

A nitrapyrin hatóanyagtartalmú nitrogén stabilizátorok (a talajban lévő Nitrosomonas baktériumok gátlásával) az ammónium ionok nitrát ionokká történő átalakítását akadályozzák meg, így a nitrátok kimosódása csökkenthető, valamint a stabil ammónium ionok hosszabb ideig érhetők el a növények számára.

Számos tanulmány igazolta a nitrapyrin hatékonyságát vetés előtti kijuttatás esetén, azonban a talajhőmérséklet hatása még nem teljesen tisztázott. Abból a megfontolásból, hogy a Nitrosomonasok aktivitása 25-30°C között tetőzik, ill. a kukorica nitrogén igénye a szármegynúlás (6-8 leveles fenofázis) időszakában a legmagasabb, indokolt lehet a nitrapyrin későbbi kijuttatása.

Kísérleteinkben különböző hőmérsékletű talajokon vizsgáltuk a nitrapyrin hatékonyságát. Laboratóriumi körülmények között beállított 10°C, 15°C, 20°C és 25°C hőmérsékletű talajok nitrapyrinnel történő kezelését követően a nitrát tartalom mérésén keresztül követtük nyomon a nitrifikáció dinamikáját, amely során a talajhőmérséklet emelkedésével a nitrifikáció nagyobb mértékű gátlását tapasztaltuk.

Szabadföldi (takarmány kukoricában beállított) vizsgálatainkban vetés előtti (13°C-os talaj) és kései (25°C) kijuttatás során történt nitrapyrines kezelés. A növények számára a nitrapyrin kései kijuttatása bizonyult kedvezőbbnek, ugyanis a levelekben jelentősen magasabb relatív klorofill tartalmat mutattunk ki, emelett a nagyobb nitrogénellátottságot laboratóriumi levélanalízis eredményei is alátámasztották. Eredményeink a növénykultúrák jobb egészségi állapotának biztosítása érdekében, a nitrapyrin hatóanyagtartalmű nitrogén stabilizátoros kezelések megfelelő időzítésének jelentőségére hívják fel a figyelmet.

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Changes of chlorphyll content of maize hybrids for the effect of different zinc and nitrogen supply

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Maize (*Zea mays* L.) is one of the most imporant crops in Hungary. The versatility of its useage is expanding thus, there is a claim to increase its yield and improve its quality parameters. Balanced nutrient supply is prominently important during plant development. Nitrogen (N) is extraordinary as one of the most widely applied fertilizer. Microelements were absorbed by plants at a relatively low rate but they significantly influence various plant physiological processes. One such essential element is zinc (Zn) which is extraordinary important for plants which was following the C4 photosynthetic pathway. Our goal was to examine the Zn uptake efficiency of maize genotypes and the combined effects of Zn and N nutrition supply. Our experiment was set up under controlled conditions in the climate room of the University of Debrecen, Faculty of Agricultural and Food Sciences and Environmental Management, Institute of Plant Sciences, Department of Agricultural Botany, Crop Physiology and Biotechnology. The seedlings were grown on a hydroponic system in small plots. During the experiment, the plants were grown with two N concentrations (Opt. N; ¼ N) and five different Zn (0 Zn; ½ Zn; Opt Zn; 2X Zn; 5X Zn) concentrations. According to the results of the cluster analysis of our previous experiment for N use efficiency two different genotypes (Armagnac, P9903) were involved in these examinations. Based on the results of the relative chlorophyll content, statistically significant differences were detected between the genotypes at the optimal nitrogen dose. Significant differences were observed among nitrogen treatments in case of Armagnac genotype. Based on the results, there was no significant difference between the Zn treatments. In case of total chlorophyll content, there was only a detectable difference between the mean of the genotypes regardless of Zn and N levels. The same was observed for chlorophyll-a and-b contents.

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Kocsánytalan tölgy (Quercus petraea) avar lebontásának vizsgálata egykori műtrágyázási kísérletben

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Az avar lebomlása során tápanyagok szabadulnak fel, melyek rendkívül bonyolult folyamatok során a talajba kerülnek, ott elraktározónak, kimosódnak, vagy a növények újra felveszik. A környezeti változások befolyásolhatják az ökoszisztéma folyamatainak működését. A kocsánytalan tölgy (*Quercus petraea*) gyakori és elterjedt lombhullató fa Közép-Európa erdőiben. Kutatásunkban egy mezőgazdasági tartamkísérletként funkcionáló, majd kocsánytalan tölggyel betelepített erdőben történő avarlebontás sebességének meghatározását tűztük ki célul. Az erdősítést megelőző 25 éves időszakban öt, eltérő mennyiségű és hosszú távú műtrágya-kezelést végeztek a területen (0: kontroll, valamint 1-4 kezelés egyre nagyobb műtrágya adagokkal), valamint az erdőtelepítés előtti években talajjavító meszezés is történt. A vizsgálat során avarzsákos módszerrel vizsgáltuk a tölgy avar lebontásának ütemét az összesen 491 napon át tartó kísérletben. Eredményeink azt mutatták, hogy a korábban elvégzett műtrágyázás hatással volt az avarlebontás sebességére: a meszezetlen területen 2,7-5,6%-os, a korábban meszezett területen pedig 4,9-11%-os lebontási ütem növekedést állapítottunk meg a 0-3 műtrágyával kezelt területeken. A legnagyobb műtrágyaadaggal kezelt területen (4) azonban 8,8% (meszezetlen) és 2,3% (meszezett) lebontási ütem csökkenés volt megfigyelhető.

Az előadás elkészítését az EFOP-3.6.3-VEKOP-16-2017-00008 számú projekt támogatta. A projekt az Európai Unió támogatásával, az Európai Szociális Alap társfinanszírozásával valósult meg.

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Vízi növényzet hatása a szabad vízfelületek párolgására

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A párolgás a hidrológiai ciklus kulcsfontosságú eleme, kapcsolható a felszíni energia egyensúlyhoz, így a vízciklus összes alkotóeleme közül a párolgás az az elem, amelyet a klímaváltozás közvetlenül befolyásolhat. A víz és a légkör közötti összetett összefüggések alaposabb megértése komoly kihívást jelent a meteorológusok és a hidrológusok számára. A párolgás intenzitása függ a beérkező energiamennyiségtől (sugárzás), a vízfelszínnel érintkező légréteg sajátosságai közül pedig a levegő párabefogadó képessége játsza az egyik legfontosabb szerepet. A tavak párolgásának meghatározását általában párolgásmérő kádakkal valamint tapasztalati formulákkal végzik. Ezek a módszerek azonban nem veszik figyelembe, hogy egy tó vagy víztározó nem csupán tiszta vízből áll, hanem a vízben, illetve a felszín fölé emelekdve számos vízinövény életteréül is szolgál. Ezek a növények megváltoztathatják a víztest párolgását is. Kutatásunkban a keszthelyi Agrometeorológiai Kutatóállomáson végeztünk vizsgálatot különböző életforma-csoportokba tartozó hínárnövények párolgásmódosító hatásának feltárására 2020 tenyészidőszakában, párolgásmérő „A" kádak felhasználásával. További célunk volt a különböző növényekkel betelepített kád-párolgások és a mért meteorológiai változók közötti kapcsolat vizsgálata a Kutatóállomáson található QLC 50 klímaállomás adatainak felhasználásával. A hínárnövényeket tartalmaó „A" kádak mellett egy kontroll kezelést (hagyományos alkalmazású) is beállítottunk. Eredményeink azt mutatták, hogy a betelepített növények, életforma-csoporttól függetlenül szignifikánsan magasabb párolgást eredményeztek a kontroll kezeléshez képest. A meteorológiai elemek közül a léghőmérséklet és a telítési hiány állt a legszorosabb kapcsolatban minden kád párolgásával.

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Vízmegvonás hatása két szójafajta (Sianara, Sigalia) termésalakulására, valamint a termés csírázóképességére és tárolhatóságára

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A szója (*Glycine max*) a világélelmezésben jelentős szerepet tölt be, kedvező fizikai és kémiai tulajdonságai miatt sokoldalúan felhasználható. A növény Kelet-Ázsiából származik, ahol a virágzás és terméskötés idején nem csak a csapadékmennyiség jelentős, de a levegő is magas páratartalmú. Más régiókban, így hazánkban is, ahol a klimatikus viszonyok eltérőek, a szója csak kisebb-nagyobb termésingadozással termeszthető. Mivel a növény épp a virágzás időszakában (június közepétől augusztus elejéig) a legérzékenyebb a vízhiányra, a megfelelő, toleráns fajták kiválasztása elsődleges fontosságú. Két szójafajta (Sinara és Sigalia) vízhiányra adott válaszának jobb megismerésére kísérletet állítottunk be a keszthelyi Agrometeorológiai Kutatóállomáson található 8 db Thornthwaite-Matther féle kompenzációs evapotranspirométerben, melyből 4-et a növény optimális vziellátására, 4-et pedig vízmegvonásra használtunk a növény virágzása idején. A vizsgálattal célunk volt meghatározni, hogy a vízmegvonás hatására (1) milyen mértékben csökken a termésmennyiség, valamint a magok fehérje és olajtartalma; (2) változik-e a magok csírázó képessége; valamint (3) öregedés vizsgálatot követően változik-e a csírázóképesség (tárolhatóság). Eredményeink szerint a vízmegvonás hatással volt a magok legfontosabb beltartalmi jellemzőire (olaj és fehérje tartalom), valamint az eltérő vízellátás és az öregedési vizsgálat is befolyásolta a szója csírázóképességét mindkét szójafajta esetében.

Az előadás elkészítését az EFOP-3.6.3-VEKOP-16-2017-00008 számú projekt támogatta. A projekt az Európai Unió támogatásával, az Európai Szociális Alap társfinanszírozásával valósult meg.

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A gyékény (Typha sp.) különböző részeinek tápelem kioldódási dinamikájának vizsgálata a Balaton és a Kis-Balaton területén

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A vízi ökoszisztémákban a szerves anyag bomlása összetett folyamat, amelyet főként baktériumok és gombák végeznek, a gerinctelenek különböző csoportjai által végzett aprító tevékenységgel együtt. A növényi biomassza lebomlása a tápanyag-ciklus fontos alkotóeleme a vizes élőhelyeken. A gyékény (*Thypa* sp.) világszerte elterjedt növényfaj, amelyek mocsaras területeken alkotnak kiterjedt, magas (akár 3 méteres) állományokat. Ez a növény jelentősen hozzájárul a mocsaras, valamint sekély, vízzel borított területeken az autohtonikus bevitelhez. Ezért a gyékény lebontási folyamatainak megértését nemzetközi szinten is kulcsfontosságú folyamatnak tekintik a vizes ökoszisztémákban, mely információkat szolgáltat a vizes élőhelyek működéséről. Rendkívül sok tanulmány foglalkozik a gyékény víztisztítási folyamatainak vizsgálatával, de azzal már kevesen, hogy a növény elhalása után milyen folyamatok zajlódnak le. Vizsgálatunkban célul tűztük ki a gyékény 3 növényi részének (buzogány, szár és levél) által vízbe juttatott ammónium és foszfát-mennyiség meghatározását a Balaton és a Kis-Balaton területén. A vizsgált növényi részek közül a buzogány esetében kaptuk a legmagasabb értékeket az ammónia és a foszfát esetében is, mindkét vizsgálati helyszínen. A szár esetében mindkét vizsgált tápanyag a Kis-Balatonban volt magasabb. A levél esetében pedig ammóniánál a Balatonban, foszfátnál pedig a Kis-Balatonban mértünk magasabb értékeket.

Az előadás elkészítését az EFOP-3.6.3-VEKOP-16-2017-00008 számú projekt támogatta. A projekt az Európai Unió támogatásával, az Európai Szociális Alap társfinanszírozásával valósult meg.

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Az aranyvessző (Solidago virgaurea) lebontási üteme a Hévízi-tóban és a Hévízi-lefolyó különböző hőmérsékletű pontjain

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A Solidago nemzetség több mint száz fajból áll, amelyek többsége Észak-Amerikából származik, nyolc faj fordul elő Mexikóban, négy Dél-Amerikában, és hat-tíz faj őshonos Európában, és Ázsiában. Európában a leggyakrabban megjelenő faj a *Solidago virgaurea*, mely invazív növénynek minősül hazánkban. Az invazív aranyvessző negatív hatást gyakorol más növényfajokra, csökkenti a sokféleséget, és jelenlétével módosítja az ökoszisztéma többi elemét. Magyarországon a tavak és folyók mentén egyre nagyobb területeken hódít, így a Hévízi-tónál és a Hévízi-lefolyó partján is megfigyelhető terjedése. A természetes vizekben kimutatható háttérterhelés egy jelentős részét a vízbe hulló avar adja, így annak feltérképezése, megértése nélkülözhetetlen a jó vízminőség elérésben és fenntartásában. Egy terepi kísérletet állítottunk be az aranyvessző (szár, levél) lebontási dinamikájának tanulmányozásához a szakirodalomban elterjedt avarzsákos módszer alkalmazásával. Mivel a Hévízi-tótól távolodva a vízhőmérséklet csökken, ezért a lebontás hőmérséklet függésének feltárásához három, különböző hőmérsékletű pontot jelöltünk ki a Hévízi-lefolyó mentén. Mindkét vizsgált növényi rész esetében a Hévízi kifolyó 1. pontján fogyott a leggyorsabban az avar. Ettől a ponttól távolabb eső mintavételi helyszínek esetében az avarlebontás ütemének csökkenését figyeltünk meg: az aranyvessző levél esetében 27,6-34,7%-kal, míg a szár esetében 5,1-12,1 %-kal több visszamaradt száraz tömeget mértünk.

Gábor SOÓS[1] - Angéla ANDA[2]

Modelling evapotranspiration of common reed stands in the Kis-Balaton wetland

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During the examination of the water balance of Kis-Balaton wetland, the measurement and determination of evaporation and evapotranspiration can be difficult to solve by direct measurement. Evapotranspiration - as outcome parameter - is essential for the operation of the Kis-Balaton Water Protection System (KBVR).

The evapotranspiration of the common reed (*Phragmites australis*), which plays a decisive role in ecosystems of KBVR marshes is a significant factor due to the fact that the area of reed canopies exceeds 2,000 hectares. Determining the evapotranspiration of wetland crops is a complicated task. Although it is possible to measure in lysimeters, the development of the plant stand and the effect of the environment could be problematic. The actual evapotranspiration from the heat balance and the Bowen ratio can be modelled indirectly by using microclimate measurements. Modelling can be performed with resistances expressed by meteorological parameters, whose values are temporally variable.

Examinations in a reed canopy of Ingói-berek was carried out with a Bowen mast in summers over the five years from 2015 to 2019. The meteorological parameters were measured every 10 minutes as follows: surface water temperature, air temperature and air humidity in the canopy, air temperature and humidity and wind speed at two levels above the canopy. Our measurements were supplemented weekly with canopy heights and leaf surface measurements (LAI), which are important model inputs. Hourly and daily evapotranspiration data were counted from the 10-minute microclimate probes.

Our goal was to clarify the role of common reed evapotranspiration in the water balance equation and how the modelling can be used to estimate reed evapotranspiration in the long run.

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Szójaállomány evapotranszspirációjának modellezése Bowen-aránnyal

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A szántóföldi növények evapotranszspirációjának meghatározása bonyolult feladatnak számít. Eddig közvetlenül kompenzációs evapotranszspirométereket használtunk az aktuális evapotranszspiráció meghatározásához. Közvetett módszerként a hőháztartási egyenletből, és a Bowen-arányból kiindulva lehet mikroklíma mérésekkel az aktuális evapotranszspirációt modellezni. A modellezést mért meteorológiai paraméterekből kifejezett analóg ellenállásokkal végezhetjük, melynek értékei az idő folyamán változnak.

Vizsgálatainkat 2019-től 2020-ig nyarán a Szent István Egyetem Georgikon Kampuszának Agrometeorológiai Kutatóállomásán szója állományba kihelyezett Bowen-oszloppal végeztük. A 10 percenként mért meteorológiai paraméterek: állományban mért léghőmérséklet és légnedvesség, állomány felett két szintben mért léghőmérséklet és légnedvesség, és állomány felett mért szélsebesség, valamint több szinten mért talajhőmérsékletek. Méréseinket heti rendszerességgel a modell szempontjából fontos állománymagasság és levélfelület-mérésekkel (LAI) is kiegészítettük. A 10-perces mikroklíma adatokból órás és napi evapotranszspirációt számoltunk.

Célkitűzésünk, hogy a szója közvetett módon meghatározott tényleges párolgását modellezzük, és a módszer hosszú távon is alkalmazható legyen.

A kutatás az Európai Unió és a Magyar Kormány támogatásával az Európai Regionális Fejlesztési Alap és a Széchenyi 2020 program társfinanszírozási konstrukciójában a GINOP-2.3.2-15-2016-00029 azonosító számú projekt keretében valósult meg.

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Effects of a trans-galactooligosaccharide on minerals in tissues of common carp (Cyprinus carpio L.)

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The aim of the study was to evaluate the effects of a trans-galactooligosaccharide prebiotic (GOS) on content of selected minerals in the meat, gills and skeleton of common carp (*Cyprinus carpio* L.) from aquaculture. The experiment was performed on one-year-old fish with a mean body weight of 180 g (±5 g). Three diets were used: control diet 1 without feed additives (C); diet 2 (B1) with 1% of prebiotic, and diet 3 (B2) with 2% of prebiotic. The results showed no statistically significant differences in Ca content between fish fed 1% and 2% GOS compared control treatment (0% GOS) for each tissue. The highest level of Mg was detected in the skeleton of fish fed 1% GOS (2.51 g·kg-1), and significantly higher compared control treatment (0% GOS) (2.11 g·kg-1), but this result was similar to the value determined for fish fed 1% GOS (2.34 g·kg-1). There were no statistically significant differences in P content between fish fed 1% and 2% GOS compared control treatment (0% GOS) for all tissues. The results of the present study showed that ratio of Ca and P in carp meat was 0.91 in control group and 0.86 and 0.49 in fish fed 1% and 2% GOS, respectively. As numerous studies show, the value of this ratio should be 1:1 in consumed products, because an excess of Ca over P is not absorbed because this form of calcium phosphate is not biologically available. Zn content in fish fed 1% GOS (35.41 mg·kg-1) was significantly higher than control group (24.59 mg·kg-1). Gills were the major storage sites for Zn. As analyses of carp indicated, trans-galacto-oligosaccharide addition caused statistically significant higher level of Fe in the meat of fish fed 2% GOS (290.32 mg·kg-1) in comparison with control group (94.86 mg·kg-1) and fish fed 1% GOS (111.33 mg·kg-1). Enhanced absorption of Fe may result from a reduced pH due to increased fermentation in the presence of prebiotic which causes an increase of iron solubility (*Yeung et al.*, 2005).

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Az Uniós támogatáspolitika hatása a földhasználatra

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A kutatás a mezőgazdasági földhasználat talajminőséget érintő hatásainak szabályozásával foglalkozik, különös tekintettel az EU-s támogatások szabályozására. Áttekintjük az érvényben lévő szabályozás jelenlegi helyzetét, a fejlesztés igényeit és lehetőségeit, konklúziónkban javaslatokat téve a szabályozás pontosítására, illetve kiegészítésére. A közös agrárpolitika (KAP) jogalapja az Európai Unió működéséről szóló szerződés. A KAP különböző alkotóelemeit a mezőgazdasági termelők részére nyújtott közvetlen kifizetésekre vonatkozó rendelkezéseit 1307/2013/EU rendelet; a mezőgazdasági termékpiacok közös szervezésére vonatkozó 1308/2013/EU rendelet; a vidékfejlesztés támogatására vonatkozó 1305/2013/EU rendelet; és a közös agrárpolitika finanszírozására, irányítására és monitoringjára vonatkozó 1306/2013/EU rendelet tartalmazza. Az agrárium szereplőit jelenleg kiemelten foglalkoztatja, hogy miként változik a támogatási rendszer az új, 2020-tól érvényes költségvetés kialakítása után. A támogatási rendszer átalakításával, megváltoznak a jövedelem-elosztási viszonyok, melyek már rövid- és középtávon is jelentős hatást gyakorolhatnak a termelési szerkezet és a földhasználat alakulására. A kutatás célja, hogy elemezzük és lényegre törő összefoglalást adjunk a KAP 2020 utáni uniós költségvetési időszakában várható átalakításáról, a változtatások Magyarország mezőgazdaságára gyakorolt hatásairól.

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The Challenges of Sustainable Soil Protection legislation in Hungary

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The (agro-ecological) impact of human activities, especially agriculture, on the environment requires special attention from the state, landowners and land users, as well as society as a whole, and requires complex soil protection regulations. A lack of synergy can be seen in the difference between the current legal definition of land and soil and agro-ecological definitions. Based on the obligation and authorization of the Constitution, the general, framework-type regulations of land protection are contained in the Environmental Protection Act (Kvt.), compared to which special legislation in several other areas prescribes special requirements. Of these, the Act on the Protection of Agricultural Land (Tfvt) should be highlighted, which regulates the utilization and protection of agricultural land, which makes up about 87% of the country's territory. Land protection is the quantitative protection, while soil protection is the qualitative protection of arable land. A Kvt. and Tfvt. follows different approaches and goals. The aim of the research is to describe the lack of synergy of the Hungarian soil protection regulation in the intersection of the Fundamental Law and the regulation of environmental law and the Land Protection Act.

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Wheat based diet improved the production traits and influenced the dinamics of the ammonia emission from the faeces of broiler chickens

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Research into environmentally friendly feed additives has become one of the main challenges of animal husbandry in the 21st century. It is generally accepted that shifts in the intestinal microbiota composition may be the result of dietary changes, such as the addition of cereal fibers. Therefore, the current study investigated the effects of wheat based diet on the performance parameters and the dinamics of the ammonia emission from the faeces of broiler chickens. In total, 192 male Ross 308 one day-old chickens were divided into 24 floor pens and fed a corn-soybean based control diet (M) and wheat and wheat bran containing (W). The wheat bran content of the starter, grower and finisher diets were 3, 6 and 6%, respectively. Diets were isocaloric and contained the same levels of crude protein and essential amino acids. During the 40 day long fattening period, the growth rate, feed intake, and feed conversion of birds were measured. At the end of the trial, the dry matter content of faeces was also measured and at different time intervals the ammonia emission from the representative faecal samples determined. The wheat-based treatment improved significantly the weight gain and feed conversion of chicks without effect on the feed intake. Treatment W increased the dry matter content of excreta and after 4 hour the rate of ammonia emission. From the results it can be concluded, that the wheat-based diets can modify not only the production traits, but also the excreted microflora composition and probably this way the urease activity of the faces.

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Az agrár képzések nemzetköziesedése - külföldi hallgatói élmények a magyar felsőoktatásban

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Az elmúlt időszakban a globalizációs folyamatok és az interkulturális- multikulturális jelenségek nem csak a munkaerőpiacon, hanem az oktatásban is erőteljesen megjelennek. A felsőoktatás nemzetköziesedése pedig olyan kérdéseket és potenciális problémahelyzeteket generálnak, amivel feltétlenül foglalkoznunk kell.

A 2020-ban lezajlott nemzetközi kutatásunkban a felsőoktatásban tanuló hallgatók külföldi hallgatótársaikkal való kapcsolatát, kommunikációját vizsgáljuk, abból kiindulva, hogy a nyelvismeret szintje a kapcsolatépítés és az elfogadás egyik letéteményese lehet. Jelen előadásunkban az hazai agrárképzésben résztvevők tapasztalatait mutatjuk be. Kutatásunk eredményei rámutatnak arra, hogy annak ellenére, hogy a külföldi hallgatók száma növekszik a hazai egyetemeken, a hallgatók ritkán találkoznak külföldi diákokkal, ami nyilvánvalóan továbbra is akadályozza a hatékony társadalmi együttműködést és tovább táplálhatja az előítéleteket. Mindezek miatt azt javasoljuk, hogy a felsőoktatási intézmények helyezzenek nagyobb hangsúlyt a külföldi hallgatók beilleszkedésére és alakítsanak ki olyan tanítási-oktatási módszereket, amelyek ösztönzik a magyar hallgatók nyitottságát ezen a téren is.

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The effect of hail net on the water potential of apple orchards

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Extreme weather conditions (like frost damage and droughts) can cause problems in apple growing, however using hail net is one of the active protection methods. Its benefits include that it positively influences the microclimatic factors, its shading effect has a positive effect on growth, reduces the risk of sunburn and transpiration, thus helping to improve the water supply of plants.

The aim of our research was to evaluate the long-term effect of hail net on the orchard water balance of Early Gold and Golden Reinders apples. The research area is located at Pallag, University of Debrecen. The studies were carried out in July and August on a weekly basis in 2019 and 2020. Mesurements were made at 10 am, and there were measurementes which aims to survey the dynamics of the effect of hail net on houly basis. In this study air temperature, relative humidity, water potential, dry matter content of leaf samples, and soil moisture in the root zone were measured in orchard with hail net and without hail net. Correlations between the treatments and statistical analyzes were performed in R software.

Based on our results, the temperature in the hail net was lower and the relative humidity was significantly higher. The difference between soil moisture values is negligible. Without separating the varieties, the water potential values of the trees covered with hail net were on average higher than without it. The positive effect of the hail net on the water potential was observed in the apple orchard for both studied varieties. The dry matter content of the leaf is lower on average, which supports the positive effect of the hail net on the orchard water balance. Based on our results, we found that the use of hail net influences the microclimatic factors, and based on the water potential, it has a positive effect on the fruit water balance of an apple in summer period.

László SZABÓ

Impact of climate change on technical logistics

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Climate change affects all areas, and logistics is no exception. We need to respond to climate change in a number of ways, on the one hand by placing more emphasis on prevention, and on the other hand, by preparing for the inevitable changes. We need to design supply chains to meet new expectations. Logistics is a very carbon-sensitive sector in this respect, sensitive to rising energy costs or regulating CO2 emissions. In all areas of the supply chain, we need to apply solutions that help to achieve the desired goals, that to reduce emissions, and to find the right response to the challenges of climate change. This is true for all areas of logistics, including technical servicing of material flow processes. The technical servicing of the physical material flow requires the use of new tools and new technologies. At the same time, the need for growth in supply chains is also a central issue. That is, nowadays the role of efficiency is increasing in the field of logistics.

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A kistermelői élelmiszerelőállítás minőségfejlesztési kérdései

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Magyarországon a kistermelő fogalmát az 52/2010. (IV. 30.) FVM rendelet szabályozza. A kistermelő saját gazdaságából származó alaptermékét és az abból általa előállított terméket adott mennyiségi és területi korlátok betartásával értékesítheti. A kistermelő más kistermelő vagy magánszemély megbízásából végezhet többek között füstölést és aszalást. A rendelet többek között meghatározza az értékesítés területi lehetőségeit, szabályozza a csomagolatlan és a csomagolt kistermelői élelmiszer árusítását. 28/2017 (V.30.) FM rendelet az élelmiszer-vállalkozások által működtetendő önellenőrzési rendszerre vonatkozó követelményekről hatálya alá a kistermelői élelmiszer előállítása és forgalmazása nem vonatkozik. A HACCP rendszer rendszerint tartalmazza az önellenőrzési tervet. A HACCP rendszer bevezetése nem kötelező a kistermelők számára. A 852/2004 EK rendelet határozza meg, hogy a helyes higiéniai gyakorlat helyettesítheti a kritikus szabályozási pont felügyeletét. A minőségfejlesztés során tevékenységek egésze vagy egy részének fejlesztése a cél, különös tekintettel a minőségi problémák prevenciója, megelőzése; a problémás folyamatok felismerése és fejlesztése új minőségelemek bekapcsolásával. Az előadásomban azt vizsgálom, hogy melyek a kistermelők számára az élelmiszerbiztonsági veszélyek, azok következményei egyértelműek-e; felmérik-e a helytelenül végzett tevékenységek egészségügyi veszélyeit; a kistermelők megfelelően alkalmazzák-e megszerzett ismereteiket, továbbá milyen helyesbítő tevékenységet léptetnek életbe, ha szabályossági hiányosságokat észlelnek.

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Napjainkban a regionális szemléletnek egyre inkább fontos és jelentős szerep jut. Az éghajlati viszonyok fokozatos változásához való alkalmazkodásban az öntözéses gazdálkodás lehetőségként, de egyben szükségszerűségként is kínálkozik. Számos jel utal arra, hogy a forró és aszályos időszakok száma megnő az elkövetkezendő időszakban, így az öntözés kifizetődőnek bizonyulhat a gazdálkodó számára és a nemzetgazdaság egésze egyaránt.

Kutatáson célja az öntözés területi egyenlőtlenségeinek vizsgálata Magyarországon. Az egyenlőtlenség az egyik legsokoldalúbban vizsgált kérdésköre a területi kutatásoknak. A szekunder adatgyűjtés során az Országos Meteorológiai Szolgálattól meteorológiai adatokat gyűjtöttem, NUTS II. és NUTS III. szinten vízjogi engedélyek összesítését, a megöntözött területek nagyságát, a kiöntözött vízmennyiséget és az egy hektárra jutó vízmennyiséget összegyűjtöttem és rendszereztem 2006 és 2019 közötti években. Kutatásom során kiemelten kezeltem az öntözővíz eredetét és kiadagolásának módját. Az adatokat feldolgozását matematikai-statisztikai módszerrel elemeztem SPSS és Excel programokkal. A gyűjtött és rendszerezett adatok alapján területi egyenlőtlenségi mutatókat számoltam.

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Nagyváthy János (1755-1819) korának kiemelkedő hatású mezőgazdasági szakírója, természet és társadalomtudósa. 1791-ben megjelent, két kötetes „A' szorgalmatos mezei gazda a Magyarországban gyakoroltatni szokott gazdaságnak rendjén keresztül" könyvével a magyar nyelvű mezőgazdasági szakirodalom megalapítójává vált. 1792-1797 között a keszthelyi központú Festetics-birtok jószágkormányzója, minden bizonnyal ő adta a tanácsot Festetics György grófnak a Georgikon alapítására. 1797-től haláláig Csurgón élt. Tanulmányunkban ebből a korból származó egyik – kevéssé ismert – írását mutatjuk be.

A Tudományos Gyűjtemény 1817-1841 között jelent meg, havonta megjelenő tudományos folyóiratként. Első szerkesztője a keszthelyi születésű Fejér György (1766-1851) volt, aki az előszóban így fogalmazott: *„A' Magyar Nemzetnek felvilágosítását, csinosúlását , szerencsésítését is önnön nyelvénél fogva érhetni el legkönnyebben, legbizonyosabban, legközönségesebben; csak e' közzel tarthatni fenn annak sajátságát is, melly azt billyegzi."*

Nagyváthy az első évfolyam harmadik kötetében jelentette meg értekezését 12 oldal terjedelemben (65-76. p.) „A' Balaton taváról". A „Magyar Országi Tengernek" nevezett tó véleménye szerint megérdemli, hogy „kellemetes helyeztetése, természetes tulajdonsága" miatt azon „Hazafiak elött is esmeretessé tétessék, kiknek idejök, alkalmatosságok, vagy módjok nintsen, hogy tulajdon tapasztalások által igaz esméretet szerezhessenek magoknak". Nagyváthy Kálmán Nagyváthy Jánosról szóló életrajzában külön leírást szentelt a Balaton kapcsán végzett kutatásainak - Csurgóról utazott fel több alkalommal a Balatonhoz.

A Balatonról szóló tanulmányában Nagyváthy a tó történetét, forrásait, eredetét, élővilágát és hasznosítását írta le, emellett a környező terület természeti leírását is megadta. Előadásunkban és tanulmányunkban bemutatjuk a művet, elhelyezzük Nagyváthy életrajzában, művei sorában, és összevetjük a Balatonról kapcsolatos jelenlegi ismereteinkkel.

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Value proposition in short food supply chain based on SWOT analysis in SmartChain project

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One of the key objectives of the Union's rural development policy is to improve the design and operation of Short Food Supply Chains (RELs). The task of the SmartChain project is to explore the barriers to the efficient and sustainable operation of REL and to propose innovative, practical solutions to solve the problems. https://www.smartchain-h2020.eu/ . The analysis of the operation of the 18 short supply chain case studies involved in the project is done based on SWOT analysis. Among the RELs operating in Hungary, the analysis of the Zala Thermal Valley was performed. Based on the SWOT analysis, on the one hand, the value propositions offered by the Zala Termal Valley were identified. During the three years of operation of the SmartChain project, innovative technological and non-technological solutions are collected and analyzed that can be used to solve the problems identified in the short supply chain based on the SWOT analysis.

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The impact of corona virus on food consumption habits

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The impact of this study was to explore the changes in consumer behavior, with special emphasis on attitudes towards local food, due to COVID-19. A survey, representative for gender, age, and city-type (N=1000) was conducted in Hungary through phone interviews, when the lock-down measures were about to be lifted. Thus, respondents could express their opinion in the light of experiences of social distancing. Factor and cluster analysis were applied involving variables related to attitudes towards food consumption and training habits before and at the end of the pandemic. Schwartz-portrait values (SPV) were also used to describe personalities.

In spite of early positive tendencies reported by key stakeholders of the local food sector, consumers seemed to turn away from the presumably healthy local food on average. Cluster analysis revealed three major parts in our sample. The biggest group (66%) 'Conformists' was characterized by minimal changes in the food buying and food preparing habits; and a little bit more interest in doing exercises, compared to the other clusters. The members of the smallest group (11%) purchased more convenience food, cooked more often, and ordered, too, food for the main dishes. Furthermore, they give up regular exercises, thus, they might seem 'Couch potatoes' at first sight. Sociodemographic variables revealed that they were typically intellectual workers or managers. Regarding SPVs, this latter group was significantly dominated by the variables of self-enhancement (achievement, power, hedonism).

While important elements of lifestyle were apparently not affected by the coronavirus in case of the majority of the Hungarian society, a visible minority did face a period deteriorating health. As this consumer segment is expected to be interested in health-related issues, a potential market gap seems to form if an additional wave of turmoil is foreseen. Innovations related to the development of healthy alternatives for convenience food items, personalized soft training programs might be demanded.

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Hope beyond the COVID-19: Antiviral effects of wines and wine compounds

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It is well known even from the ancient times, that wines have beneficial health effects. In this study, the antiviral effects of wines and the most efficient wine compounds (resveratrol, quercetin, other polyphenols and shikimic acid) are reviewed. It is concluded that the moderate chronic consumption of either white or red wines could have beneficial effect to the immune system to prevent virus infections and moderate the symptoms. It is suggested to drink wine every day for everybody excluding those who cannot do that because of the increased risk of addiction, who have religious reasons for abstaining, who have allergic reactions for one or some of the substances who are taking medication that adversely interacts with alcohol, and perhaps during pregnancy or breastfeeding.

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Examination of the impact of Ustilago maydis infection on some parameters of sweet corn

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The corn smut fungus (Ustilago maydis) is one of the most important pathogens of corn. Its infection can be expected every year in Hungary and Europe as well. Although the fungus can infect the corn in any of its phenophase, cob infection occurs as the most severe damage. Pathogen control is extremely challenging since the effects of the fungicides are not reliable, as well as the prevention of mechanical injuries and insect damages is impossible.

In this study, we were focused on the infection of Ustilago maydis in sweet corn (Zea mays L. cv. Desszert 73) in various phenological phases (4-5 leaves and cob growth). Infectious material was prepared under laboratory conditions on gola-specific (PSZA) medium. Ten plants were infected in the vegetative stage and five in the generative stage with 10 000 sporidium/ml number inoculum. Relative chlorophyll content, plant height, stem diatemer, cob lenght, cob and kernel weight, as well as the cob and cob core diameter were measured.

Results were showed the negative effect of Ustilago maydis infection in both the vegetative and generative stages. While cob and kernel weight were decreased the most, the reduction of the stem and cob diameter, as well as the plant height was the smallest.

Beside the pathogenicity of the pathogen, also the susceptibility of the host plant influence the host-parasite relations. According to the research findings sweet corn is more sensitive to the corn smut infection compared to feed corn. Furthermore, canning industries are not take over sweet corn cobs or grains infected by corn smut. These results can assist further investigations aimed at the promotion of resistance breeding, as well as diagnosing the damages resulted by pathogens at various phenological phases.

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Sustainability, energy production and agricultural production

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The Bruntland report generated several definitions of the concept of sustainable development. The original – environmental, ecological – interpretation was soon applied to economic (financial) and even social aspects. Today, it is broadly accepted that "sustainability" has three dimensions.

In our view, sustainability means a long term sustained harmony between the economic, social and environmental dimensions.

Consumers aware of health issues recognize more and more the harmful effects of industrialised agriculture. Alternative agricultural production, where farming is a way of life and man endeavours to live in harmony with nature, is expanding world wide and in Hungary, too. Integrated crop production and precision farming may result in healthier food, but their technical and funding background is difficult to ensure.

In the last years it became obvious that the environment polluting and energy wasteful lifestyle of mankind could lead to the running out of natural resources and ecological catastrophe in long term.

Therefore, the state encourage tools shall be focused on demolich of economic, regulation and institutional barriers existing before spreading renewable energies. A decrease in energy consumption is an important objective to decrease the risks of climate change as well as to ensure the security of supply.

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"It's true that nothing grows there, but at least it doesn't get in your way!" - Farming and nature conservation

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The goals of nature conservation can only be achieved together with the people who live in the given landscape, cultivate it. A significant area of the Carpathian Basin is made up of agricultural landscapes, so it is essential to get to know the relationship of both intensive and extensive farmers living there to nature and nature conservation.

In Mátyusföld, Slovakia, we were looking for the answer to the questions related to nature conservation that currently occupy farmers. We conducted 16 semi-structured interviews with informants between the ages of 25 and 82 years.

Based on the interviews, we can state that farmers "love the land", economic aspects are important to them, but they condemn those who do it only for that reason. The negative effects of climate change are most pronounced in water management. Problems are the unpredictability of rainfall conditions, the drought that lasts for months, and then the sudden heavy rainfall. Large-scale farming is considered convenient, but they say that it is not possible to adapt to the conditions of the production site on large plots. Chemical use is seen as an expensive, necessary evil, so they try to reduce it. Only half of the respondents mention the role of wildlife and the surrounding landscape in arable farming. They lack the former marshes and tree lines that give variety to the landscape. The wildlife for them is primarily represented by the small game, which is gradually losing its habitat.

Among the topics important for farmers, the preferences of state nature conservation are strongly underrepresented, e.g. protection of wetlands, conservation of biodiversity. This underlines the need to research what natural values farmers find worthy of protection and why they are willing to take active action. In this way, nature conservation priorities can be defined, broken down to the level of feasible practical tasks.

László TEKNŐS

The Climate Change Security Aspects in the 21st Century

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The connection between security and global climate change, both internationally and domestically, has been highlighted by several renowned experts. For instance, according to American Professor Emeritus Richard Anderson Falk, the faster the pace of climate change, the more difficult it will be to adapt its negative effects and changes in state beyond tolerance, which can even lead to armed conflicts. According to Joshua W. Busby, climate change poses a serious threat to security and social well-being in the United States, as well as in other countries. Climate change will cause disasters of humanitarian nature at the international level, contributing to the spread of internal unrest, which will occur mainly in countries with weaker governments. Professor Padányi's opinion on this matter is that the climate change is one of the global challenges, affecting the security of countries. According to him, the lack of energy, food supplies and/or drinking water, scarcity, decreasing in the capacity of support, availability of strategic raw materials, access, location, etc. should be examined as indicators of the correlations. According to the author, environmental problems increase the likelihood of conflicts arising from civilisation. Existing ecological and human crises are already placing a burden on societies, the impact of which is only exacerbated by the negative effects of climate change. Social, economic, ecological tensions, conflicts, armed riots and collisions, mainly at local levels, are expected to arise due to the need to own freshwater, forests, fisheries, arable land, and areas less affected by disasters.

It can be observed that due to today's environmental changes, deterioration, dangerous anomalies on a global scale (extreme weather, direct and indirect health effects, habitat changes, etc., reduction of icy areas), national security, law enforcement, health, large and small consumer care-type challenges, risks are emerging. Aware of this, the author attempts to interdisciplinary illustrate the effects of climate change and extreme weather anomalies in his lecture, to analyse and evaluate them from disaster management and security policy point of view. The lecture presents how the negative effects of climate change affect international security, how they shape and form the perspectives of individual nations about security, what conflicts they can generate, and what international cooperation is needed, for instance, for a more stable state of environmental security.

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Disaster Management and Climate Change

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Climate of Earth has changed constantly throughout Earth's history, because the warmer (interglacial) and colder (glacial) periods exchanged each other cyclically. According to the report from the Intergovernmental Panel on Climate Change (IPCC), humanity influences this phenomenon. This divides the scientific world but they agree that the environmental changes that can be experienced recently are causing serious national security, home defence, law enforThecement, population protection and economic problems. We can observe dangerous global anomalies (extreme weather, direct and indirect health effects, habitat changes, the decrease of ice areas, etc.) that already affect the natural and man-made environment and the security of life and material goods. According to this, it is imperative that the pace of global climate change and the interdisciplinary research of extreme weather anomalies be present in all the national security sector's systems of tasks and in the scientific–research–education activities.

In this poster, the author attempts to present Hungary's vulnerability due to weather extremities with the help of the disaster management classification of settlements, to evaluates the risks of climate change from the angle of disaster response; and to analyses the extreme meteorological anomalies.

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Disaster Management Tasks Due to the Effects of Climate Change and Extreme Weather

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In the fight against the negative effects of climate change, the tasks of disaster management are to identify risks, assess vulnerabilities, develop their classification system, realize a sense of security at a social level, develop self- and co-rescue, socialization of support activities, the implementation of which is always relevant. The results of these can help the risk-based approach of disaster management tasks, the process of forecasting, the modernization of prevention and protection procedures, decision-making, the development of assets, and the more efficient implementation of tasks arising in disaster management cycles.

The main threads of this lecture are the analysis between climate change and security, along the creation of disaster protection typology models of extreme weather events and climatic extremes, both their national and international effects (especially in terms of public service aspects), analyses and examines extreme meteorological anomalies, considering the statistics of the Hungarian firefighting marches.

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Examination the effect of heat-treatment by studying the mRNA and miRNA expression profile in tissues of treated chickens

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The ability of animals to sense and respond to elevated temperatures is essential for survival. Transcriptional control of the heat stress response has been much studied, whereas its posttranscriptional regulation by microRNAs (miRNAs) is not well understood. We analyzed the expression level a subset of miRNAs what is known thermoregulated in heat treated chickens.

Fertilized eggs from Transylvanian Naked Neck Chicken were collected from National Center for Biodiversity and Gene Conservation, Institute for Farm Animal Gene Conservation in Gödöllő (NBGK-HGI), Hungary. These fertilized eggs were collected from hens of two groups. The first one was the control group, the second group was subjected to heat treatment (38.5oC) at the age of 2 days for the first 12 hours.

The main family of HSP studied in chicken is HSP70. Our analysis indicated that in the tissues of the heat-treated group had a significantly higher cHsp70 expression than in the control group. These findings indicate a role of HSP70 to prevent the undesirable effect of heat stress. We studied miR-92, miR181a and miR-138 expression immediatelly after the heat treatment and at 24 weeks. We found higher expression level of miR-92 and miR-181a but significantly lower expression of miR-138 in brain tissues of heat-treated groups comared tot he control in adult chickens. We found that the heat-treated group had significantly higher tolerance to heat stress comparing the developmental potential of treated and nontreated chicken progenies. We think that there is a cross talk between HSP70 and miR-138. In chicken, the epigenetic temperature adaptation is associated with changes is the thermosensitivity of the relevant hypothalamic neurons and the peripheral thermoregulatory mechanisms.

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Assessment the impact of drought stress on protein fractions of Mexican durum wheat cultivars

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Durum wheat is grown in the Mediterranean basin, the northern plains of the United States and Canada, the desert areas of the southeast of the United States and Mexico. Durum wheat is the tenth most important crop worldwide. The quality of the end-products is related to the quality of the durum grain, which is determined by the genotype, environmental factor, level of nutrition and crop management. Drought is one of the most serious stresses affecting crops, and may change quality of yield. Protein quality is one of the most important quality characteristics of durum wheat in relation to the determination of pasta and bread-making quality.

The objective of this study was to analyse the effects of drought stress on protein quality and quantity of seven durum wheat cultivars (Aconchi89, Altar84, Cemexi C2008, Nacoric97, Rafi 97, R10 Colorado and Scooty9). All cultivars were grown in Ciudad Obregon, Sonora (Mexico). Polymeric and monomeric protein fractions were determined by SE-HPLC.

Variation of the percentage of soluble and insoluble mono- and polymeric proteins was detected among cultivars. Soluble large polymeric proteins (LPPS) significantly decreased only in Scooty9. Soluble small polymeric proteins (SSPS) significantly increased in three cultivars, while LMPS significantly decreased at five cultivars. Soluble small monomeric proteins (SMPS) were not influenced significantly by drought stress. Insoluble proteins, such as large polymeric (11%), large monomeric (12%) and small monomeric proteins (28%) significantly changed only in one cultivar (Rafi 97).

These results emphasize that drought stress had a significant effect on protein fraction in the investigated Mexican cultivars. These changes may have impact on bread and pasta quality parameters, as well. This result could be useful in the generation of varieties to improve quality parameters or produce two purpose cultivars for both pasta and bread production.

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Méhészeti termékek és szolgáltatások szerepének vizsgálata a turizmusban

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Kutatásunk célkitűzése a méhészeti termékek és szolgáltatások ismertségének, igényének felmérése, valamint turizmusban betöltött szerepének vizsgálata. Tervezett kutatásunk többrétű, mind a keresleti, mind a kínálati oldal megismerése a cél. A nemzetközi és hazai szakirodalom áttanulmányozása után első lépésként kvantitatív kutatást végeztünk, kérdőíves felmérés keretében ismertük meg 100 fő potenciális (turizmusban) résztvevő méhészeti termékek iránti fogyasztási, vásárlási szokásait, és az apiterápiával kapcsolatos ismereteit, tapasztalatait. Eredményeinket összevetve kijelenthető, hogy a megkérdezettek a méhészeti termékek közül leginkább a mézet ismerik, néhányan egyéb termékeket is fogyasztanak, de a velük való gyógyítás (az apiterápia) és a hozzá kapcsolódó turisztikai lehetőségek kevésbé ismertek körükben, azonban szívesen kipróbálnák azokat.

Kutatásunk folytatásaként a kínálati oldal megismerése a célunk.

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A projektet az Európai Unió és az Európai Szociális Alap társfinanszírozza.

Florence TÓTH[1] - Sándor KUN[2] - Nikolett Éva KISS[1] - Péter Tamás NAGY[3]

Investigation of the effect of a complex substitution soil therapy preparation based on poultry manure in a soil incubation experiment

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Due to climate change and global population growth, there is a shrinking production area available for adequate quantity and quality of food production. The non-site-oriented nutrient management and the significant reduction in the amount of manure have resulted in land degradation and reduction of organic and nutrient content. Moreover, it resulted in a deterioration of soil water management, which has a negative impact on the quantity and quality of food production. Complex soil therapeutical productions can be prepared from fermented and added poultry manure which are able to eliminate the mentioned negative effects.

In our study, the effects of fermented and specially added (superabsorbent polymer (SAP) and clay mineral) poultry manure products were investigated in soil incubation experiments - at different water capacity levels - on humus sandy soil. The experiments were continued for one month.

Soil samples were collected from two layers of the pots per week to check the status of the tested products and the processes in the soil.

The pH and the electric conductivity of the samples were measured by electrochemical method, while the ammonium and nitrate content of the samples was determined by photometric method.

From our results, it can be concluded that the applied products did not significantly affect the pH of the soil.

Increasing levels of SAP caused a reduction in soil conductivity in both studied soil layers. The treatments with increasing SAP content resulted a significant increase in the available ammonium content in both soil layers, at both studied water capacity levels compared to the control.

The nitrate content is significant compared to the ammonium content in all soil samples. The increasing proportion of SAP increased, but not significantly the available nitrate content in the soil. Nitrate leaching was not observed between the soil layers which confirmed the importance of the used additives.

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Potential of food security, obesity, hunger and food waste

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Sustainable development has become a central and key goal to humanity (1 UN: Millenium Dev Goals, 2 SDGs). There is no scientific and political consensus, however, about the root cause of unsustainability, so an effective cure is impossible. The background of food waste is dissonant in different economic systems, so its macro- and microeconomic approach is also completely different in different countries. The relationship of obesity, hunger and food waste has not yet been explored in a structured framework, data are available, but scattered. We propose a unified framework of comparable data, as a first step to map up the biggest missing, or at least wobbling circle of modern bio-economy: global food supply. Thinking globally is a first step toward process development in food justice, and a solution to UN sustainable development goals (SDG 2, 1, 3 and 10).

VALENTIN Szilveszter

A koronavírus okozta gazdasági válság várható hatásai Gyenesdiáson

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2020. januárban lehetett hallani először az eddig ismeretlen COVID-19 vírusról, amely súlyos problémákat okozott Kínában. A pár hónap alatt pandémiává váló vírus március 4-én elérte Magyarországot is, ezen a napon regisztrálták az első két fertőzöttet hazánkban.

A koronavírus, nem csak egészségügyi szempontból veszélyezteti a világ legtöbb országát, hanem gazdasági recesszióba is sodorhatja a legtöbb nemzetgazdaságot. Ez alól, nem kivétel Magyarország sem, ahol legelőször az idegenforgalmi ágazat eset áldozatul a gazdasági szférák közül.

Az ágazaton belüli recesszió különösen negatív hatással van az ország kettő, a szektor legnagyobb forgalmat bonyolító desztinációjára, Budapestre és a Balaton régiójára is.

A napok alatt kialakult ágazati hanyatlás utóbbi térség önkormányzatait különös kihívások elé állítja. A februárban és márciusban elfogadott, az idegenforgalomra bövűlésére alapozott települési költségvetések pár nap alatt lényegüket vesztették, mivel a Kormány a közös felelősségvállalás jegyében több, az önkormányzatok gazdálkodását érinti döntést is meghozott.

Az intézkedések nagymértékben befolyásolják, a már említett önkormányzati költségvetéseket. A legtöbb település a forráselvonások és a nyári bevétel várható kiesések miatt, ezekben a hetekben kénytelenek a költségvetések módosítására.

Az előbbiekben leírtak alapján, jelen kutatásom célja, hogy felmérje a Balaton térségének egyik dinamikusan fejlődő településének, Gyenesdiásnak, a lokális gazdaságára, várhatóan milyen hatásokkal lehet a COVID-19 vírus által begyürüzött gazdasági válság.

Fontos hangsúlyozni, hogy a tanulmány alapját képző adatfelvétel, 2020. április hónap második felében készült, abban az időszakban, amikor még nem ismerhető a járványhelyzet tényleges, a nemzetgazdaság egyes ágazataira, így az idegenforgalmi szektorra gyakorolt végső hatása sem.

A várakozásokat és tendenciákat kutatva, a tanulmány összeállítása során felkerestem a település vezetését, több a településen működő vállalkozót, valamint a helyi TDM szervezetet is.

A megkérdezettek válaszait összevetve vontam le a következtetéseket, azzal kapcsolatban, hogy várakozásuk szerint saját vállalkozásuk és a település gazdasága hogyan alakul az elkövetkezendő időszakban.

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Preliminary results in Ankole-Watusi x Blonde d'Aquitaine crossing to improve heat tolerance abilities

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It is well known that the anomalies of climate change experienced in the world in recent years can also be experienced in Hungary. In the Carpathian Basin, warming is expected to be higher than the global average, which may manifest in mild springs and extremely warm summers. Extreme climatic events (droughts, floods, inland waters, storms, etc.) have a major impact on crop and livestock production. Farmers in many countries use heat-stress tolerant breeds to mitigate the performance loss caused by heat stress. In our study, we used the Ankole-Watusi African cattle breed as a crossing partner to improve heat tolerance. In the experiment, we examined the responses of six Ankole-Watusi x Blonde d'Aquitaine (AWxB) calves born in 2019 to heat stress. As a control, the same studies were performed on eight Blonde d'Aquitaine (B) calves. These studies are the first steps in a long-term crossbreeding program. During the period of heat stress (August 2019), climatic factors (temperature, humidity, THI, etc.) as well as the respiratory rate (under 30 min) and rectal temperature of the animals have been measured twice a day. Besides that, the development of drug treatments was also investigated. The animals were weighed once a week.

AWxB calves were born with significantly ($P < 0.05$) lower weight (35.83 kg) than B calves (47.67 kg). We found that the mean weight and average weight gain of the six AWxB calves were below those of B calves (AWxB: 67.17 kg, 667 g / day vs. B: 88.25 kg and 1085 g / day) by mid-September. During this period, there was no difference in the mean respiratory rate (AWxB: 31.3; B: 32.5) and rectal temperature (AWxB: 39.12 0C; B: 39.13 0C) of the tested animals. However, within group B, the individual differences were very significant, the standard deviations of AWx B calves were 4-5 times smaller, i.e., they formed a more homogeneous group than B calves. Regarding drug treatments, there was a significant difference in the number of treatments per calf for the two genotypes: while the number of treatments per calf was 3.63 for B calves, this value was 1.67 for AWxB calves. However, despite more frequent treatments, half of B calves (4 individuals) died during the heat stress period (August).

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Eltérő talajápolási módok hatása erózióra hajlamos hegy-völgy telepítésű irányú szőlőültetvényben, a 2019-es évjáratban

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A környezetkímélő szőlőtermesztési technológiák talajművelési rendszereiben a talajvédelem, ezen belül az erózió elleni védelem kiemelt szerepet kap. Az erózióvédelem mellett azonban, a szárazabb ökológiai adottságú termőhelyeken, (egyes évjáratokban) a víztakarékosság elsődleges szemponttá válhat. Ilyen ökológiai adottságokkal rendelkezik a Balatoni Régió is. A prognózisok szerint a klímaváltozás hatására egyre gyakoribb lesz a szárazság, magasabb lesz az átlaghőmérséklet, illetve gyakrabban várhatók heves esőzések. A nem megfelelő talajművelés hatására fellépő abiotikus stressz hatások negatívan hatnak a tőkék növekedésére. A NAIK Badacsonyi Szőlészeti és Borászati Kutatóintézetben közel egy évtizede, tartamkísérlet jelleggel, egy talajművelésmód összehasonlító kísérletsorozatot állítottunk be. 2019 évi kísérleteinkben a szerves növényi hulladékokkal történő talajtakarást, a tartós- és időszaki növénytakarást, valamint a mechanikai talajművelést hasonlítjuk össze lejtős (hegy-völgy irányú) rendszerben. A tartós növénytakaráshoz speciális fűkeveréket használtunk (Vörös csenkesz, Felemáslevelű csenkesz, Nádképű csenkesz, Angolperje), továbbá egy pillangósokból álló keverék (Vörös here, Bíborhere, Fehérhere, Tavaszi bükköny, Takarmánybors ó) vetésével is megpróbálkoztunk. Az időszaki növénytakarás megvalósításához Őszi búzát, Tritikálét, valamint a területre jellemző gyomösszetételt használtunk fel, továbbá Facélia sorközvetést is alkalmaztunk önálló vetésben. Az idei évben (2019) célul tűztük ki, hogy megvizsgáljuk a kezelések hatását a talajnedvességre, a talaj, - és a növény tápanyag-ellátottságára, valamint a szüreti eredményekre. Összességében megállapítható, hogy talajainkat az erózió káros hatásaitól védeni kell, főként az olyan időjárási körülmények között, mint a 2019-es évjárat volt-amikor is a száraz periódus és a hirtelen lezúduló heves esőzések váltották egymást. Az erózió elleni védekezés alapja lehet a szerves növényi hulladékkal való talajtakarás-mely kedvező, mind a talaj-, mind, pedig a növény számára (víz- és tápanyag-forgalom). Másik lehetséges megoldás a növénytakarás alkalmazása. Ezek közül is a speciális szárazságtűrő fűkeverék és a pillangós keverék bizonyult a legalkalmasabbnak. A talaj nedvességtartalma, ásványi nitrogén-ellátottsága, és a termésátlag tekintetében kimagasló eredményt nyújtott a többi kezeléshez képest a szerves növényi hulladékkal való talajtakarás, valamint a pillangós keverék alkalmazása. Ezen eredmények a kontroll parcellákon mért eredményekhez képest statisztikailag igazoltan is plusz értéket hoztak.

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Solutions for the elimination of bottlenecks and solutions of success factors to raise competitiveness and sustainability of the Short Food Supply Chains

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One of the main objectives of the European Union is to foster and develop the Short Food Supply Chains (SFSCs), through recommendations, new business models, and innovative practical solutions, which enhance their competitiveness and sustainability in the agri-food system. In the SMARTCHAIN Horizon 2020 research and innovation program (http://www.smartchain-h2020.eu/) 18 Short Food Supply Chains were analyzed from different countries of the EU, to identify the typical problems, barriers, needs of the SFSCs, and the appropriate technological and non-technological innovations for improving their performance. With the systematic step-by-step analysis, the typical needs of the consumers, the typical bottlenecks and success factors of the SFSCs, the solutions, such as patterns of Strengths, Weaknesses, Opportunities, and Threats can be established. This collection can be used for the identification of general, typical bottlenecks, and success factors, which can be adopted for the other types and chain members of the Short Chains. The rapid development of digital technologies and the COVID-19 crisis provides a range of new enabling functions of solutions, which can be adapted for SFSCs.

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Municipal tasks related to the integration of biomass use into the short supply chain

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Following the rapid social, economic and technical development that began in the second half of the 20th century and continues today, the changes in the natural (climate) environment require a strong future-oriented change of approach and effective operational solutions at both global and regional levels. Looking back on this few decades behind us, it can be seen that the exploitation of all the environmental resources that have served as a basis and support for this leapfrogging revolution has proved excessive. The utilization rate of these resources is already significantly longer than their period of reproduction.

However, the process that, in addition to science, policy is paying increasing attention to the balance between the living environment and society should be seen as a positive step forward. In addition, the professional assessment of the use of biomass for heating purposes is currently not uniform. Research findings, arguments and counter-arguments are in favor of both increasing and decreasing the rate of use. Professional consensus can only be concluded by the conclusion that the solution to the universal problems caused by climate change is possible only by organizing coordinated processes at regional levels.

In this connection, we examined the possibility of integrating biomass use in a short supply chain. Today's agribusinesses are forced to operate under increasingly difficult market conditions, despite the fact that the innovation opportunities available to them, such as those offered by the Short Supply Chain (REL), are currently untapped. At the same time, the rural development potential of RELs is untapped. In connection with the combination of the use of biomass for heating purposes and the favorable possibilities of REL, we examined the possibilities of biomass production among small farms from an economic point of view. To explore the possibilities of use, we identified possible organizational models for the development of a short supply chain. In the light of the REL philosophy, we placed special emphasis on the importance of the role of organizers and mediators of local governments.

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Investigation of whole transcriptomic response in BABA (β-aminobutiric acid) treated barley

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The broad spectrum effect of the non-protein amino acid, β-aminobutyric acid (BABA) during biotic and abiotic stress is well known in plants. BABA-treated plants become more resistant in subsequent pathogenic attack. This unique physiological state is the so called "primed state" of the plant. Priming effect can be elicited by stimulation of defense pathways like salicylic acid (SA) pathway. In our experiments barley plants grown in phytotron in 6 different conditions were investigated. The defense mechanisms of the plants were stimulated with BABA, SA (salicylic acid) and BABA + SA treatments and samples were collected on the first day and on day 2, which is critical for gene expression during of primed state formation. The whole expression profile of the 6 barley samples and the gene expression of the key genes of the abscisic acid, jasmonic acid and salicylic acid pathways were investigated using next-generation sequencing (Illumina NextSeq 550). Bioinformatics methods were used to determine the uniquely expressed genes in the samples, of which the numerical changes in each case showed an aumentation as a function of the elapsed time. Pair-wise gene expression analysis of the samples were performed, from which the characteristic down- or up-regulated gene-groups were determined with the significant GO (gene ontology) categories. In the targeted gene expression analysis, the SA pathway gene ICS (isochromate synthase) was repressed, while PAL (phenylalanine ammonia lyase) was induced in day 2. The OPR1 (oxophytodienoate reductase) and AOC (allene oxidase cyclase) genes of the jasmonic acid pathway were induced by the treatments except in the combined BABA + SA treated samples. In the abscisic acid pathway, the AAO3 gene (abscisin aldehyde oxidase) was largely repressed, whereas the ZEP (zeaxanthin epoxidase) gene showed strong induction. Overall gene expression profile and the targeted gene expression analysis of pathways, suggested that the jasmonic acid pathway contributed to the development of the priming state in barley, especially.

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