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### **THE INTELLIGENT TECHNOLOGICAL SOLUTIONS AS A TOOL OF EFFICIENT USE OF THE AGRICULTURE RESOURCES**

**Abstract.** *It has been determined that in recent years in Ukraine a new stage of the development of agriculture has started, which is characterized by the increase of the amount of use of information communication technologies. The legislative base regarding the development of the informational society in the agrarian sphere and the expansion of innovative opportunities of the branch have been defined. It has been proved that the development of agrarian enterprises and the increase of the competitiveness of their products depend on the volumes and availability of investment resources as well as internal and external. The problems have been outlined and the prospects of the development of the effective use of soil, industrial, labor and financial resources of agriculture have been determined. It has been established that the intelligent platforms are effective for the agrarians, which work in the sphere of big data such products as: BAYER BUSINESS PLUS, AGRIANALYTICA, SAATBAU PROFIT MANAGER and others. The peculiarities of application of intellectual technologies in the field of plant cultivation and cattle breeding and their economic consequences have been considered. The significance of the analytical systems of IT technologies has been determined in the further development of agriculture.*

**Key words:** agriculture, intellectual technologies, production of output, economic efficiency, IT technologies.

**Introduction.** One of the most promising spheres of the world business nowadays is the development of agriculture. The leading agrarian enterprises actively search and apply top-quality innovational solutions, which are capable to increase the amount of manufacture and sale of products of plant cultivation and cattle breeding, its effectiveness and productivity of activity. On the search selectionists, biologists, technologists and other professionals are working.

**Brief literature Review.** The issue of solving of present problem in agriculture has need researched by such well-known economists as V. Ambrosov, L. Antonjyk, M. Kropyvko, O. Datsij, M. Zubets, M. Koretskyj, M. Kropyvka, P. Makarenko, P. Muzyka, P. Sabluk, V. Savchuk, V. Semynozenko, V. Sytnyk and others. The separate aspects of technologies of agricultural production were studied by V. Kaplunencko, P. Kovalenko, O. Krysalnyj, M. Roik, V. Garmashov, M. Romaschenko, O. Tarariko, S. Trubel. For the introduction of the informational systems and technologies in the activity of agrarian enterprises were used methodologies and data, represented in the works of native scientists and practitioners, in particular: V. Bilinska, J. Kernasjyk, B. Malinovskyy, A. Nelepova, M. Oliyaryk, N. Tverezovska, S. Tyschenko.

**The distinguishing of unsolved previously parts of general issue.** Nowadays the main challenge of world innovational technological processes is the development of agriculture, which is aimed at the dynamics of agricultural production at the expense of the usage of leading

technologies. This will influence: the economic stability of the country; the level of enterprises profits; the demand of the population on the products due to the inclusion to its cost additional expenses so on. However, the issue of determination of the role of intellectual technological solutions in the increase of effectiveness of the use of agricultural resources is studied insufficiently thoroughly, also the peculiarities of application of latest technologies in the fields of plant cultivation and cattle breeding require clarification.

**The main tasks** of this research are the analysis of modern state of the innovational – informational support of agriculture and its influence on the effective use of the resources of agrarian enterprises; the determination of significance of the development of the effective mechanism of usage of intellectual technological solutions with the aim of obtaining of economic and social effect, and also clarification of the influence of informational technologies on the development of agriculture for the future.

**The presentation of the main material of the research.** According to the prognoses of UNO the number of the world population by 2050 will exceed the verge of 9 milliards of people. Taking this into account, the needs of food resources in the world are going to grow twice. Thus, one of the most perspective spheres of business nowadays is exactly agrarian branch of economy. The leading farmsteads, which are engaged in plant cultivation and cattle breeding, actively search and introduce the highly qualified innovational solutions, which are capable to increase the amount of production and sales of products, its competitiveness and rise of productiveness of the activity of enterprises of the branch. On the search of the effective innovational solutions selectionists, biologists, technologists and other professionals are working [1].

The modern agrarian enterprises function in the epoch of constant changes and so called "revolutions", which create the conditions for permanent search of the reserves of increase of resource use effectiveness. Thus, the first agrarian revolution was the domestication of animals and plants, the second – the introduction of rotation of crops, the third – "green revolution" of the 60-ies, and the fourth has started and its indication is the growth of amount of usage of the informational – communicative technologies in agriculture [2]. Herewith, on the way of new intellectual technological solutions are such essential obstacles as high cost of their application and lack of skilled knowledge in manufacturers of agrarian output.

Nowadays in the world the amount of information is constantly growing. Thus, according to the records of analysts of the company IDC, in the world by 2020 the general amount of digital data will reach 40000 milliards of Gb, opposite to 8000 milliards of Gb in 2015, which is going to cause the need in its analysis and processing. According to the prognoses of analysts of Gartner, the world market of the "Internet of Things", which includes connected to the world network personal computers, tablets, smartphones, will grow up to 26 milliards of gadgets in 2020. This will make almost 30-fold increase in comparison to 0,9 milliards in 2009 [3]. Along with this the companies of the "Internet of Things" and suppliers of service are going to receive additional profits, which will exceed 300 milliards of US dollars, mainly in the sphere of services, and by 2020 the profit from the sale of equipment, software and services will reach almost 1,9 trillions of US dollars [4].

The Ukrainian government in the person of the Ministry of Agrarian Policy and Food of Ukraine is actively supporting the development of IT-technologies in agriculture. Thus, on the nationwide level already in 2005-2007 the following legislative acts in informatization were accepted by the present Ministry: the Order "About the approval of the Plan of measures of development of informational society in the agro-industrial complex of Ukraine for 2007-2015" from 10.09.2007 №653; The Laws and conceptions "About computerization" and "Informatization of AIC"; The Resolution "About the approval of Regulation about the Register of informational, telecommunication and informational telecommunication systems of the executive agencies, and also enterprises, institutions and organizations, which belong to the sphere of their administration" from 3<sup>rd</sup> of August 2005 № 688 [5].

Besides this, in April 2017 the profile Ministry declared about the necessity of the establishment of global platform, which is going to become the single branch ground and convenient channel of communication for all, who are interested in the agrarian sector, who works

or plans to start his activity in agribusiness. This allows to have a lot of possibilities for the active exchange of important information and successful experience. Simultaneously and other tendencies of the formation of intellectual platforms for agrarians, who work in the sphere Big Data, especially such products as BAYER BUSINESS PLUS, AGRIANALYTICA, SAATBAU PROFIT MANAGER and others have already received the development [6].

The Ukrainian experts affirm that agrarian business climate of Ukraine has reached the new tops, which are characterized by the increase of gained profits of agricultural manufacturers, the stable growth of assessment of current and potential development of business. The dynamic development of agriculture gives a possibility to actively introduce new technologies. The support of foreign companies, where the Ukrainian programmers are working, creates all grounds to affirm that agribusiness will actively develop and introduce its developments for the benefit of the economy of Ukraine [7]. Thus, according to the assessment of experts, the automatization of processes of usage of mineral fertilizers and herbicides allows to economize up to 50% on fertilizers. While the struggle with weeds, the economy of chemicals can reach 90% at the expense of considered usage of the fungicides and herbicides. In Europe, it was determined that approximately 260 Euro on each hectare can be received of the direct economy at the expense of rational use of fertilizers [8].

The development of enterprises of agriculture and the growth of competitiveness of production of agrarian output, to large extent depend on the volume and accessibility to investment resources. In 2018, the tempo of growth of capital investments in the agrarian sector of economy slowed down considerably. Herewith generally in Ukraine the share of agrarian production in investment in 9 months of this year diminished for 2,4%, comparatively with the indexes of three quarters of the last year, when the tempo of increase was equal to 13,4% [3, p. 67]. Despite of the deceleration of the tempo of increase of capital investments in agriculture, it is still preferential for investors. Taking into consideration the planned in new budget reduction of the amount of state support in 2019, further slowing down of the investment activity in agriculture should be expected. The additional measures for the intensification of investment activity in agricultural production and other segments of agrarian economy are necessary. The agrarian enterprises need new approach to the organization of internal planning. For the attraction of foreign investors, the availability of business plan is necessary, which would correspond to the international standards and would be adapted to the domestic realities. Thus, there is the necessity in the improvement of mechanism of business planning with the application of modern informational technologies. In the process of business planning the most widely used are programs Comfar (UNIDO), Project Expert, packages of companies "INEC" and "Alt-Invest", Project Manager, Success and others [9, p. 297].

The agrarian sector of Ukraine almost does not attract foreign investors since the threshold of profitability of the branch does not exceed 3%. For reaching of the middle European economical level Ukraine has to ensure the increase of economy of the branch of agriculture on the level of 6-7% and higher. For this the investment appeal of agrarian sector of economy should increase, the conditions for highly technological production should be created. The foreign investors want to cooperate with agrarian business of Ukraine because of cheap raw materials and manpower, and business is interested in Swedish, British, American investors, who can introduce better technologies and practices. The agro-industrial sector of the economy of Ukraine needs investment not less than 75 milliards of UAH per year [10, p. 602].

During the last decade, the activity of many agrarian enterprises was modified fundamentally and continues to change thanks to the IT technologies. The agrarian business depends on such factors: natural and meteorological conditions, the usage of property sized expensive equipment, big staff of employees, needs of optimization of logistics and warehousing, the necessity of monitoring of the state of plants and animals – this causes special needs in the service of IT companies.

Let's examine the intellectual technological solutions, which already today help the producers of agrarian output to enlarge, effectively use available resources and correspond to modern needs of the market. Especially in plant cultivation it is: the rational usage of soil resources,

the harvest prognostication, the qualitative improvement of selective and sorting trial work, the development and realization of intensive technologies of growth of different cultures. The firm "Massey Ferguson" – the first company which started to make the combines with the device for creation and usage of the cards of harvest. The combines are equipped with the global positional and the geographic informational systems have connection with satellites through the receiver antennas, and also the equipment for performing of monitoring of crop capacity. The similar equipment is produced by companies "John Deere", "Claas", "New Holland", in Ukraine "Agricon" and others [5].

The analytical systems of IT technologies in the branch of plant cultivation resolve such issues as planning of the optimal arrangement of plants, the rotation of them in crop alternation; planning of the possibility of mixed sowing and planting, basing on the retrospective analysis of sowing and the amount of production of goods with the observance of factors and rules of the optimization of present processes. The intellectual technological solutions allow to reduce maximally the dependence on natural conditions, to use the peculiarities of the nature in favor of the development of plants, to automatize the irrigation system, to plan the usage of fertilizers based on the chemical analysis of content of nutriment of every field, to realize the monitoring of availability of pests and to plan the usage of insecticide in case of exceeding of the threshold of their harmfulness etc. [1].

The electronic agrochemical passport of every field can be accessible in computer or on mobile gadget. With the use of the latest IT systems, the productivity of cultures grows, and the expenses of resources reduce. The analytical systems give the opportunity of automatic calculation of the need of seeds, fertilizers and means of protection of plants, and also ensure the function of effective management of soil, industrial, working and financial resources of the agrarian enterprises. To such programs include: GEO-Agro, GIS Panorama Farming, Farm Works Site (Pro), SST Summit, SMS Desktop Software (Advanced i Basic), JD Reports MAP, AgrarOffice, Agro-Net NG, FarmView Record Keeper and others. Also, the administrative programs exist for a pocket computer (PPC or communicator) [9, p. 298].

It should be marked that the improvement of agrotechnical works will ensure the economy of mineral fertilizers for 13,9 milliards of UAH per year. However, along the course of introduction of resource saving and minimal technologies of soil cultivation "Mini-till", "No-till" or "Zero-till" and "Strip-till" different problems appear, especially the insufficiency of your own financial resources, the low level of state support of present process, the necessity of change of machine-tractor park and the limitation of the possibilities of the use of modern informational technologies. Herewith, the economical effect from the introduction of minimal soil cultivation in 2020 will make 6,3 milliards of UAH.

The effectiveness of introduction of preferential agrotechnical measures in plant cultivation are provided in the table 1.

Table 1

### The effectiveness of introduction of preferential measures in plant cultivation

Kinds of measures	Years		Rates of growth, %
	2015	2020	
<i>Biology</i>			
The introduction of organic fertilizers, millions of tons will ensure:	57,9	105	181,3
- increase of humus, thousands of tons	2606	4725	181,3
- income of NPK, thousands of tons	1186	2098	176,9
Introduction of scientifically grounded rotation of crops			
- crops of perennial grasses, millions of hectares.	1,8	1,9	105,6
- leguminous cultures, millions of hectares.	2,3	2,8	121,7

Continuation of Table 1

will ensure: - annual production of humus, thousands of tons.	3680	3760	102,2
- fixation of biological nitrogen, thousands of tons.	496	502	101,2
- saving of mineral fertilizers, millions of UAH.	4960	5020	101,2
<i>Extension of crops of sederal cultures</i>			
Area of crops, millions of hectares will ensure:	1,5	2,0	133,3
- production of humus, thousands of tons.	1350	1800	133,3
- income of NPK, thousands of ton	251	342	136,2
- saving of mineral fertilizers, millions of UAH.	1960	2620	133,7
<i>Exploitation for fertilizers by-products of plant cultivation</i>			
Volume of by-products, millions of tons will ensure:	28,8	37,5	130,2
- production of humus, thousands of tons.	4296	5513	128,3
- income of NPK, thousands of tons	630	820	130,2
- saving of mineral fertilizers, millions of UAH.	4920	6280	127,6

The resource: [11, p.78]

The latest intellectual technological solutions in the branch of plant cultivation relate to the selective work and genetic engineering; organic agriculture; micro irrigation, space informational technologies, nanotechnologies. In the selection of agricultural cultures in Ukraine are engaged approximately 120 scientific institutions, which handle the selective work with more than 300 kinds of plants.

Nowadays five types of systems of micro irrigation exist: channel-intercropping, circular, dripping, drum and lining. The dripping irrigation is the most popular in Ukraine. In 2004 the areas under this type of irrigation made 25,0 thousands of hectares, already in 2014 their number was up to 59,2 thousands of hectares. The usage of achievements of space branch becomes the most reasonable condition for strengthening of agrarian production development. It is actual enough in modern conditions, as the availability of considerable soil territories determines the necessity of obtaining of the information about the state of resources, the effective usage of natural resource potential and material and technical resources, the prognostication of fruitfulness.

The introduction of modern systems of the land tenure and informational agrotechnologies demand the development and application of innovational informational technologies. To such systems can be referred Global Positioning System (GPS), "Rapid Eye", CORINE Land Cover (Coordination of Information on the Environment). In NAAS, the conception of scientific technical program "The monitoring of agro resources and prognostication of their state with the usage of data of remote probing "Agrospace" was developed, the execution of which assists the coordination of space scientific technical works in agrarian sphere and the creation of state informational system of monitoring of resources.

Besides this, the soil climate conditions of Ukraine give the opportunity to expand considerably the volume of organic agriculture, which according to experts' assessments can reach 7% of agricultural lands in 2020 [11, p. 78].

The considerable increase of productivity and adaptability of cultures by means of the transfer of the branch of plant cultivation on the post-industrial model of development according to the prognostic indexes will lead to the increase of their fruitfulness in 1,5-2,7 times (tabl. 2).

Table 2

**The results of productivity of agricultural cultures from the introduction of intellectual solutions, h/he**

Cultures	Years			2020 year in % till	
	2010	2015	2020 (прогноз)	2010	2015
Cereals and legumes	26,9	43,8	49,4	183,6	112,8
Sugar beets	280	400	438	156,4	109,5
Oil plants	15,2	22,0	29,6	194,7	134,5
Vegetables	174	222	256	147,1	115,3
Melons	92	125	250	271,7	200,0
Fruit-berries	76,1	98,4	130,0	170,8	132,1
Grapes	60,3	62,0	69,3	114,9	111,8

The resource: [11, p. 78]

The effectiveness of usage of mobile part of main resources is achieved at the expense of the maximally effective use of all available transport means and tractors and tools of agrarian enterprise. The organization of work of technological operations of growth of cultures is determined through the realization via such services as Navizor.com, which analyze the disposition of points of conducting of agrotechnical works, the gathering of harvest, the distances to them, the cargo-carrying capacity of separate transport means, the possible routes of delivery of materials and output, the maximally admissible time for their delivery and even the quality of paving. The integration from the systems of GPS-monitoring allows also to control the relocation of all mobile resources of farmer in the mode of real time and timely react to considerable delays or deviation from the route [1].

The big opportunities of effective usage of resources of agrarian enterprises give the use of smartphones and mobile applications, which can accomplish: the tracking and control of transport means; the control of drivers; the reminding and warning; the accompaniment and support. All necessary information will ensure such programs as: GEO-Recordkeeper, GEO-Plan, Pocket measuring device, Argonaut, Farm Works Mobile, SST Stratus, SMS Mobile, AGRO-GPS Mobilbox and others [9, p. 296].

The effectiveness of usage of labor resources of agrarian enterprises allows determining the automated management of staff on the base of key indexes of effectiveness. The specialized CRM and HRM systems allow to simplify the process of management of intercommunication with the staff, clients, partners. They give an opportunity in online mode to give instructions to the workers and react to their requests, and the workers can form field reports with attaching of photo or video materials; also, there is an opportunity to keep the track of the activity and effectiveness of work of every worker; to introduce the effective programs of loyalty for motivation of increase of efficiency of work.

For the effective usage of reversible resources of the agrarian enterprise and the increase of quality of output of plant cultivation there are a lot of effective logistic IT solutions, which solve the task of the creation of optimal routes for gathering and delivery of final products from the field to warehouse or elevator. The routes are organized with the help of special algorithms in the mode of real time in such a way to maximally effectively use available mobile resources, to economize the material and labor resources, to conduct the timely and qualitative gathering of harvest and to deliver it in the determined points and in prescribed time [1].

On the Ukrainian and foreign markets exist informational technologies for the effective usage of technologies of agro-logistics at the agro-industrial enterprises. The software product, which is produced by the company ESRI (США) ArcLogistics 9.3 – is the tool for planning and optimization of work of park of transport means. The main defect of the product is the cost which

makes approximately 12,5 thousands of US dollars. One of the software products for agro-logistics is Truck Stops, the product of the firm Micro Analytics. Truck Stops. The usage of Truck Stops allows the firms to reduce the cost of delivery, improves offered to clients service, suggests effective according to the cost routes, increases the administrative management. But the defect of the product is also the cost of the program, which makes approximately 1650 US dollars [9, p. 295].

The application of automated logistic solutions in the activity of agrarian producers allows to achieve the economy of expenses of fuel-oil materials and working time during the first month of functioning. The present intellectual solutions increase the quality of stockpiling of products, reduce the risk of its waste and considerably lessen the loss of harvest, which on average makes 6,6% for grain transportation. The modern logistic solutions allow to realize the possible consideration of the factor of weather conditions: some products should be optimally gathered while dry weather; others – after the rain, and some kinds of products – after light frost, as it influences its qualitative characteristics and further storage [1].

The branch of agrarian sphere, which needs significant investments and at the present stage of development is in crisis condition, is cattle breeding. But its decline stimulates the subjects of ménage to the further modernization, the improvement of technological equipment and the application of latest intellectual technical solutions. For the branch of cattle breeding with the effective use of its resource potential of opportunities of the modern informational systems allow: to keep the optimal microclimate in the premises with animals; to keep the track of the dynamics of their health, increase of the weight of animals and the accordance of given indexes to normative criteria; to automatize the planning of the herd structure; to take into account the genealogy and biological cycles while planning of the reproduction of animals; to form automatically the ratio of their nourishment; to automatize the plan of veterinary actions (vaccination, examination, weighing etc.).

The essence of innovational technologies, which concern the cattle breeding, consists in the application first of all biotechnologies with the use of methods of cellular and genetic engineering in the increase of reproductive functions of animals and in perspective – the creation of native market of pedigree resources, which could completely ensure the internal need and would be oriented for export.

The modern norms of feeding should take into account the needs of animals in energy, dry matter, proteins, carbohydrates, cellulose, fat, microelements, carotene, vitamins by the method of creation of various regimes of feeding regarding the corresponding animals species through the exactness of its dosage. The technical technological support, which is characterized by the renewal of technological base of farms with the latest equipment for maintenance of animals, is quite weak. Due to the shortage of organizational and economic, financial and material technical support for the introduction of resource saving technologies, which are based on the complete automatization of the process, the usage of robotics, the creation of feeding base, the breeding of highly productive livestock are absent. The main task for the branch of cattle breeding, thanks to the introduction of intellectual technologies, is the increase of production of gross output in 2020 to 83,4 milliards of UAH that is almost twice bigger than in 2010, and also the increase of volumes of meat production in deadweight in 2020 to 4365 thousands of tons or the tempo of growth of this index is going to make 112,0 % [11, p. 80].

The management of the main technological processes at the dairy farm is directly accomplished with the help of specialized computerized platform Delaval Delpro™ Farm Management, which realizes the intellectual functions Smart Farm for the integral management of dairy production. The agrarian enterprise, which is engaged in the purchase of products from the population or delivers to them the biological resources for continual growth, conducts the exact accounting of the purchased or returned output by each natural person and gives bonus (monetary, food, discount etc.) when achieving the certain volume of stockpiling, about what the system automatically informs the administration of farm and the person, who received the bonus.

In Ukraine already appear the IT companies, which choose agrosphere to be the main profile of their activity and concentrate their focus exactly on the solutions for the given business. The

company from Ivano-Frankivsk [bvblogic] has more than 10 years of experience in the development of software and the expertise in the creation of exactly agrarian intellectual solutions, which give the possibility to the company to undertake the complicated projects even for big agroholdings. The agro-industrial enterprise Astarta and Borsch Ventures, the company from the sphere of high technologies, created the common company Agro Core. It will work at the developments of innovational systems of administration of agribusiness. The Ukrainian agrarian production should necessarily set the task of the achievement of European level of yield of milk – 6,3 tons per a cow per year, and in Ukraine – 4,4 tons per year. The average fruitfulness in Ukraine is lower in 2-3 times, than in highly developed countries. Thus, our country has the potential, which should be used and two branches should be united, in which we have the biggest progress – it is agricultural production and intellectual technologies [7].

#### **The conclusions and perspectives of further research.**

For the making of rational administrative decisions in agriculture the modern technologies allow to reveal the imperfections and risks in technological processes. Introducing in the activity of agrarian enterprises of innovative technologies, investment funds work not only on the strategic plans, but also on the tactical possibilities, economizing soil, industrial, labor and financial resources of agriculture. Thus, the economic effect from the introduction of minimal soil cultivation in 2020 will make 6,3 milliards of UAH. The increase of productivity of cultures according to the prognosis indexes will lead to the growth of their fruitfulness in 1,5-2,7 times in 2020, comparatively to 2010. The improvement of agrotechnical works will ensure the economy of the mineral fertilizers for 13,9 milliards of UAH per year. The soil climatic conditions of Ukraine give the opportunity to considerably broaden the volumes of organic agriculture, which according to the experts' assessment can reach 7% of agricultural lands in 2020. Thanks to the introduction of intellectual technologies the growth of the production of gross output will take place in 2020 up to 83,4 milliards of UAH, that is almost twice bigger than in 2010, and also the increase of volumes of production of meat in deadweight in 2020 up to 4365 thousands of tons or the tempo of acceleration of this index will make 112,0%.

We assume that further research need the issues of introduction of intellectual technological solutions in the production of niche cultures and organic output, which have the considerable export potential and are the most perspective tendencies of development of Ukrainian agribusiness.

#### **References**

1. UHBDP. (2017). IT innovatsiyi v ahro biznesi [*IT innovations in agro business.*] Retrieved from: <https://uhbdp.org/en/news/innovatsiji-v-apk/1306-it-innovatsii-v-ahro-biznesi-8-kliuchovykh-napriamkiv-pro-iaki-vam-var-to-diznatys> [in Ukrainian].
2. B. Malinovsky. (2017). Chetvertaya agrarnaya revolyutsiya budet informatsionnoy. [*The fourth agrarian revolution will be informational*] Retrieved from: <https://propozitsiya.com/chetvertaya-agrarnaya-revolyuciya-budet-informacionnoy> [in Russian].
3. Kovtun, V.A. (2017). Prychyny nyz'koyi investytsiynoyi pryvablyvosti ahrarynoho sektoru ekonomiky Ukrayiny ta napryamy yiyi polipshennya. [*Reasons for low investment attractiveness of the agrarian sector of Ukraine's economy and directions for its improvement.*]. Implementatsiya standartiv Yevropeys'koho Soyuzu v ahraryniy sferi ekonomiky Ukrayiny: pratsi Mizhnarodnoyi naukovo-praktychnoyi Internet-konferentsiyi. Kherson pp. 66-69. [in Ukrainian].
4. Tanklevska, N.S., Synenko, A.A. (2017). Features of operation of financial support agricultural enterprises in Ukraine. Economics, Management and Law: Problems and Prospects: Collection of scientific articles. Vol.1. Agenda Publishing House, Coventry, United Kingdom. pp. 286-289 [in Ukrainian].
5. Tvezovskaya, N.T., Nelepova, A.V. (2017). Informatsiyni tehnologii v agronomii [*Information technology in agronomy.*]. Retrieved from: [https://idruchniki.com/1337101861366/informatika/rozvitok\\_vprovadzhennya\\_informatsiynih\\_tehnologiy\\_silskomu\\_gospodarstvi](https://idruchniki.com/1337101861366/informatika/rozvitok_vprovadzhennya_informatsiynih_tehnologiy_silskomu_gospodarstvi) [in Ukrainian].



6. Kernasyuk, Yu.V. (2018). Big data: innovaciini mozhlyvosti pidvyshennia prybutkovosti agrobiznecu [*Big data: Innovative opportunities for increasing the profitability of agribusiness.*]. Retrieved from: <http://agro-business.com.ua/agro/idei-trendy/item/8396-big-data-innovatsini-mozhlyvosti-pidvyshchennia-rybutkovosti-ahrobizne-u.html> [in Ukrainian].

7. IT-technology for agriculture. (2017). Retrieved from: <https://marketer.ua/ua/it-tehnologiyi-dlya-sil'skogo-gospodarstva/>

8. Oliyarik, M. (2017). It-vrozhaj: jak visoki tehnologiji dopomagajut rozvivati silske gospodarstvo [*IT-harvest: how high technology helps to develop agriculture.*] Retrieved from: <https://biz.nv.ua/ukr/publications/it-vrozhaj-jak-visoki-tehnologiji-dop-omagajut-rozvivati-sil'ske-gospodarstvo-692335.html> [in Ukrainian].

9. Tischenko, S.I. (2015). Rol' informatsiynykh tekhnolohiy u diyal'nosti ahrarnykh pidpryyemstv. [*The role of information technology in the activities of agrarian enterprises.*] Visnyk KhNUU them. VV Dokuchaev Series "Economic Sciences". No. 3. S. 291-297. [in Ukrainian].

10. Kovtun, V.A. (2018). Stan ta perspektyvy investytsiynoho zabezpechennya haluzi sil's'koho gospodarstva Ukrayiny. [*Status and prospects of investment support of the agricultural sector of Ukraine.*] Modern Science Movement, Way Science: Works of the IV International Scientific and Practical Internet Conference (Dnipro, December 6-7, 2018) Dnipro. P. 599-604. [in Ukrainian].

11. Bilinska, V. (2015). Suchasni innovatsiyni tekhnolohiyi v sil's'komu gospodarstvi: osnovna kharakterystyka ta perspektyvy vprovadzhennya. [*Modern innovative technologies in agriculture: main characteristic and prospects of implementation.*] Visnyk Kyuyiv's'koho natsional'noho universytetu imeni Tarasa Shevchenka. No. 7 (172). Pp. 75-81. [in Ukrainian].

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## ІНТЕЛЕКТУАЛЬНІ ТЕХНОЛОГІЧНІ РІШЕННЯ ЯК ІНСТРУМЕНТ ЕФЕКТИВНОГО ВИКОРИСТАННЯ РЕСУРСІВ У ГАЛУЗІ СІЛЬСЬКОГО ГОСПОДАРСТВА

**Анотація.** Визначено, що протягом останніх років в Україні розпочався новий етап розвитку сільського господарства, який характеризується збільшенням обсягів використання інформаційно-комунікаційних технологій. Визначено законодавчу базу щодо розвитку інформаційного суспільства в аграрній сфері та розширення інноваційних можливостей галузі. Обґрунтовано, що розвиток аграрних підприємств і підвищення конкурентоспроможності їх продукції залежать від обсягів та доступності до інвестиційних ресурсів як внутрішніх так і зовнішніх. Окреслено проблеми та визначено перспективи розвитку ефективного використання земельних, виробничих, трудових та фінансових ресурсів сільського господарства. Встановлено, що ефективними для аграріїв є інтелектуальні платформи, які працюють у сфері Big data такі продукти як: БАЙЕР БІЗНЕС ПЛЮС, AGRIANALYTICA, SAATBAU PROFIT MANAGER тощо. Розглянуто особливості застосування інтелектуальних технологій в галузі рослинництва та тваринництва та їх економічні наслідки. Визначено значення аналітичних систем ІТ технологій в подальшому розвитку сільського господарства.

**Ключові слова:** сільське господарство, інтелектуальні технології, виробництво продукції, економічна ефективність, ІТ технології.

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