

DOI 10.26886/2520-7474.2(34)2019.4

UDC 631/635:331.463(614.8.069)

**THE CURRENT STATE OF OCCUPATIONAL TRAUMATISM IN THE  
CONDITIONS OF THE UKRAINIAN AGRO-INDUSTRIAL: PROBLEMS  
AND PERSPECTIVES**

**I. Kamenska, PhD of Agricultural Sciences, Associate Professor**

**O. Bokshyts, PhD of Historical Sciences, Associate Professor**

SHEI «Hryhorii Skovoroda Pereiaslav-Khmelnitskyi State Pedagogical University», Pereiaslav-Khmelnitskyi, Ukraine

*To investigate the state of industrial injuries (including fatalities) in Ukraine in general and in the agro-industrial complex for the period from 2011 to 2017, and to identify ways to increase the level of occupational safety.*

*Investigation of the condition of occupational injuries in the conditions of the agro-industrial complex of Ukraine was carried out using the probabilistic-statistical method of analysis. In the study, we used the statistical method of analysis of occupational injuries in Ukraine from 2011 till – 2017, which is based on the study of injuries according to the report of the State Labor Service of Ukraine.*

*For the first time the analysis of occupational injuries in Ukraine from 2011 till-2017 was carried out according to the report of the State Labor Service of Ukraine. The ways of raising the level of labor protection in agriculture are proposed.*

*On the basis of analysis of the data of the State Labor Service of Ukraine for the period of 2011-2017, it has been established that the state of occupational injuries is declining, both in Ukraine as a whole and in the agro-industrial complex. Despite the fact that the level of injuries in the aforementioned years decreased, it should be noted that the industry of the*

*agro-industrial complex in the period 2011-2014 took the third place in Ukraine by the level of injury and the second place – by the level of injuries with fatalities, and in the period 2015-2017 – third and first place respectively.*

*In 2011, in the agro-industrial sector, 10,0% of the total number of traumatized people was injured at enterprises of Ukraine, and 17.9% of the total number of deaths were injured, in 2012, respectively, 9,9 and 18,6 in 2013 – 9,9 and 16,4, in 2014 – 10,9 and 17,3, in 2015 – 14,1 and 22,4, in 2016 – 13,1 and 20,8, and in 2017 – 12,5 and 20,5%.*

*An analysis of the state of occupational injuries in the areas of supervision was conducted. The obtained results may be used as to prevent and eliminate potential hazards.*

*In order to improve the work of the service on labor protection, it is continuously necessary to analyze the state of occupational injuries in the areas of supervision. This will enable you to prevent and eliminate potential hazards. Therefore, in order to create safe and harmless working conditions, it is constantly necessary to improve the legal regulation of labor protection in agriculture, to update the rules, norms, standards, instructions, regulations in accordance with the development of NTP and modern technical support of the agro-industrial complex and apply the experience of the world.*

*To reduce occupational injuries, it is necessary to develop and implement a sectoral system of labor protection management; to increase the efficiency of labor protection work at agricultural enterprises of all types of property; to provide employees with regulatory and labor protection laws, which take into account modern labor safety requirements; to intensify control over compliance with safety standards and working conditions in the workplace, paying particular attention to the technical aspects of occupational safety.*

*The analysis of the condition of occupational injuries in the field of supervision provides an opportunity to assess the dynamics of occupational injuries (including fatalities), to anticipate, eliminate potential hazards in production and to propose perspective ways to increase the level of labor protection in Ukraine.*

*Keywords: occupational safety, innovations, legal regulation, the raised danger, an industrial traumatism, the dynamics of fatal injuries, agro-industrial complex, sectoral regulations on labor protection.*

*кандидат сільськогосподарських наук, доцент, І. Каменська; кандидат історичних наук, доцент, О. Бокшиц, Сучасний стан виробничого травматизму в умовах агропромислового комплексу України: проблеми та перспективи/ ДВНЗ «Переяслав-Хмельницький державний педагогічний університет імені Григорія Сковороди», Україна, Переяслава-Хмельницький*

*У статті здійснено аналіз виробничого травматизму в Україні за 2011-2017 рр. за даними звіту Державної служби України з питань праці. Запропоновано перспективні шляхи підвищення рівня охорони праці в сільському господарстві.*

*На основі аналізу даних Державної служби України з питань праці за період 2011-2017 роки встановлено, що стан виробничого травматизму йде на спад, як в Україні в цілому, так і в АПК. Не зважаючи на те, що рівень травматизму у вищезгадані роки зменшувався, слід відзначити, що галузь агропромислового комплексу в період 2011-2014 роки займала третє місце в Україні за рівнем травматизму та друге місце – за рівнем травматизму зі смертельними випадками, а в період 2015-2017 рр. – третє та перше місце, відповідно.*

*За 2011 рік у галузі агропромислового комплексу травмовано 10,0 % від загальної кількості травмованих осіб на підприємствах*

України, та загинуло – 17,9 % від загальної кількості смертних випадків, за 2012 рік відповідно – 9,9 та 18,6, за 2013 рік – 9,9 та 16,4, за 2014 рік – 10,9 та 17,3, за 2015 рік – 14,1 та 22,4, за 2016 рік – 13,1 та 20,8 й за 2017 рік – 12,5 та 20,5 %

Для вдосконалення роботи служби з питань охорони праці, слід постійно проводити аналіз стану виробничого травматизму в галузях нагляду. Це дасть можливість достроково запобігти та вилучити можливі небезпеки. Отже, для створення безпечних та нешкідливих умов праці, необхідно постійно вдосконалювати правове регулювання охорони праці в сільському господарстві, оновлювати правила, норми, стандарти, інструкції, нормативно-правові акти відповідно до розвитку НТП та сучасного технічного забезпечення агропромислового комплексу та застосовувати досвід країн світу.

Для зменшення виробничого травматизму необхідно розробити і впровадити галузеву систему управління охороною праці; підвищити ефективність працезахоронної роботи на сільськогосподарських підприємствах усіх видів власності; забезпечити працівників нормативно-правовими актами з охорони праці, де враховано сучасні вимоги безпеки праці; активізувати контроль за додержанням нормативів безпеки та умов праці на робочих місцях, звернувши особливу увагу на технічні аспекти охорони праці.

Аналіз стану виробничого травматизму в галузях нагляду дає можливість оцінити динаміку виробничого травматизму (в тому числі смертельні випадки), завчасно передбачити, вилучити можливі небезпеки на виробництві та запропонувати перспективні шляхи підвищення рівня охорони праці в Україні.

Ключові слова: охорона праці, інновації, правове регулювання, підвищена небезпека, виробничий травматизм, динаміка

*смертельного травматизму, агропромисловий комплекс, галузеві нормативні акти з охорони праці*

**Introduction.** The agro-industrial complex is one of the largest and most important sectors of the national economy of Ukraine and the most widespread type of employment in the world. From the level of its development, the stability of functioning, the state of the economy and food security of the state, the development of the internal and external market and the standard of living of the population depends [13].

- Modernization of agrarian and industrial complex is constantly, in the process of introduction of new equipment and means of production, and approaches to ensuring labor protection have changed, new systems of standards of safety of work, technical regulations, professional training for production, science and education have been introduced [21].
- The Ministry of Agrarian Policy notes that, despite measures applied in the field of agro-industrial production, to create healthy and safe working conditions, the level of organizational work for the prevention of accidents, fires and injuries remains unsatisfactory [15].
- Occupational injury in Ukraine and in the world every year leads to large human, financial, economic, material and moral losses [1, 2, 3, 4, 5, 7, 9, 10, 16, 20]. In this regard, safety of production and occupational safety are one of the main problems in the world.

**Analysis of recent research and publications.** The condition of occupational injuries in the agro-industrial complex of Ukraine and the world is the subject of study of many national and foreign scientists [3, 4, 5, 6, 8, 10, 12-13, 15-16, 18, 21-22].

Historically, agriculture is one of the most dangerous sectors and ranks second in terms of mortality [6, 8].

Every year as a result of accidents the industry loses up to 700 thousand UAH, out of which about 67% are paid to victims, their families and dependents of the deceased, carried out at the expense of enterprises, and 33% – for payment of the first five days of temporary disability of victims. Almost 5 thousand UAH. enterprises pay in the form of fines for violating the requirements of the legislation on labor protection, about 22 thousand UAH. they annually spent as a result of equipment and tool damage [22-23].

According to V. Savchenko (2016) and others the main causes of accidents in the industry, the main topics of which are the issues of repair and operation of the machine-tractor park at the enterprises of technical service of agricultural machines are:

- imperfection of technological processes – 57%;
- high equipment wear – 12%;
- non-compliance with sanitary-hygienic factors – 10%;
- unsatisfactory organization of work execution – 7%;
- poor quality training of safe working methods or its lack – 6%;
- low labor and industrial discipline – 5%;
- reduction of the rates of reconstruction and modernization of operating enterprises – 3% [21].

According to statistics, in the general structure of the causes of accidents with severe consequences in the field of technical service of the agro-industrial complex, almost 62% occupy organizational reasons: the shortcomings in the training of workers of occupational safety, safe techniques and methods of work; unsatisfactory organization of work execution. Along with the organizational causes a variety of types of work in various weather and climatic conditions, poor working conditions, wear and

tear of engineering equipment, imperfection of techniques, methods and means of preventing injuries and occupational diseases, insufficient attention to the training of graduates in occupational safety, lack of funds for labor protection, contribute high injury and morbidity etc. [17]. T. Novak (2012) emphasizes that the maximum (more than 50%) of the percentage of injuries, occupational and cold diseases is received by the AIC technical service workers during the repair and maintenance of agricultural machines, due to unsatisfactory state of workplaces and insufficient knowledge of workers, concerning the necessary requirements for safety and working conditions in the course of various technological operations, including work with foreign machinery [17].

**Unsolved questions of the general problem.** There are many national and foreign scientific works devoted to the problem of occupational injuries in the agro-industrial complex of Ukraine and the world. There are a lot of modern developments in the labor protection industry, in relation to the prevention of injuries and occupational diseases. However, the problem remains unresolved and is becoming very urgent in our time.

**The purpose of the article.** To investigate the current state of occupational injuries (including fatalities) in Ukraine as a whole and in the agro-industrial complex for the period from 2011 to 2017, and to identify ways to increase the level of occupational safety.

**The main material.** The analysis of occupational injuries in Ukraine, in general and in the agro-industrial complex, was carried out using probabilistic-statistical method of analysis. In the study, we used the statistical method of analysis of occupational injuries in Ukraine for 2011-2017, according to the report of the State Labor Service of Ukraine (State Labor Organization) [14]. According to the results of the research, we have an opportunity to assess the dynamics of occupational injuries (including fatalities) in Ukraine as a whole and in the field of agro-industrial complex,

to propose perspective ways to increase the level of labor protection in agriculture.

Comprehensive solution of problems in the field of labor protection, the formation of a modern safe and healthy working environment, minimization of risks of industrial injuries, occupational diseases and industrial accidents, which will promote sustainable economic development and social orientation, preservation and development of Ukraine's labor potential is the main objective of the National a social program for improving the safety, health and work environment for 2014-2018 [19].

The main tasks of the State Labor Service of Ukraine:

1) the implementation of state policy in the areas of industrial safety, occupational safety, occupational health, handling of explosives, the implementation of state mining supervision, as well as supervision and control over compliance labor legislation, employment, mandatory state social insurance in part appointment, accrual and payment of assistance, compensation, provision of social services and other types of material support in order to respect the rights and guarantees of insured persons;

2) implementation of integrated management of labor protection and industrial safety at the state level;

3) implementation of state regulation and control in the field of activities related to objects of high danger;

4) the organization and implementation of state supervision (control) in the field of functioning of the natural gas market in terms of maintenance of the proper technical state of systems, units and devices for recording natural gas at its facilities and ensuring the safe and reliable operation of the facilities of the Unified Gas Transport System [14].

In its activity, the State Labor Law is guided by a number of normative legal acts. In order to improve the state of the economy, reduce the level of occupational injuries, occupational diseases and accidents in the agro-



industrial complex, a number of laws have been passed concerning the implementation of the constitutional right of citizens to protect their lives and health in the process of their work: the Labor Code of December 10, 1971; Code of Ukraine on Administrative Offenses of December 07, 1984; Laws of Ukraine «On Occupational Safety» of October 14, 1992; «About the Approval of the National Social Program for Improving the Safety, Occupational Health and Work Environment for 2014-2018» of April 4, 2013; «On the objects of high danger» of January 18, 2001; «On ratification of the International Labor Organization Convention No. 129 dated 1969 on Labor Inspection in Agriculture» of September 08, 2004; «On Agriculture» of December 20, 1991; «On Collective Agricultural Enterprise» of February 14, 1992; «On Agricultural Cooperatives» dated March 17, 1997; «On pesticides and agrochemicals» of March 2, 1995; «On Standardization» dated June 5, 2014; «On Fire Safety» of December 17, 1993, «On the Road Traffic» of June 30, 1993 and others.

Along with the laws, the source of labor protection in agriculture is the regulations and orders of the Cabinet of Ministers of Ukraine, regulations of ministries and departments, norms of international law. For example, the Decree of the Cabinet of Ministers of Ukraine «On Measures for the Implementation of the Law of Ukraine» On Occupational Safety» of January 27, 1993, No. 64, order of the Ministry of Agrarian Policy of Ukraine «On Approval of Fire Safety Rules in the Agro-Industrial Complex of Ukraine» of December 4, 2006, No. 730/770, the order of the State Inspection Committee «On the Approval of the Model Provision on the Procedure for the Training and Testing of Knowledge on Occupational Safety and the List of Work with High Danger» of January 26, 2005 No. 15, ILO Convention No. 184, 2001 «On Safety and hygiene practices in agriculture», ratified by the Law of Ukraine of April 1, 2009, etc. The main array of sources of legal regulation of labor protection in agriculture consists of rules, norms,

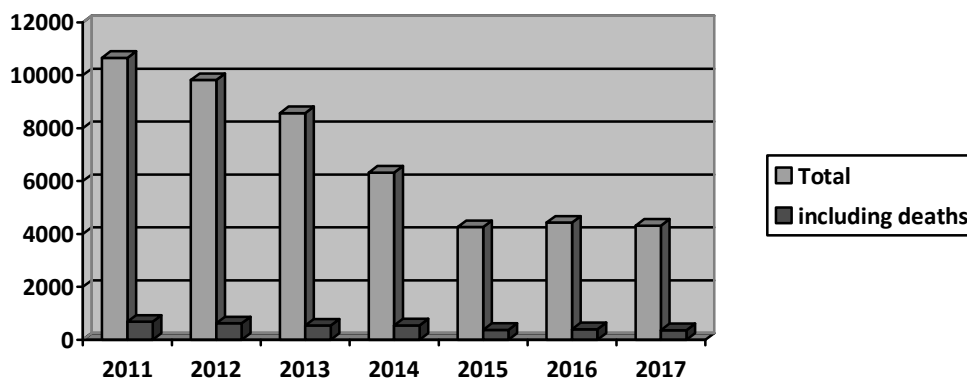
standards, instructions, incorporated into the State Register of normative legal acts on labor protection [15].

For the labor protection in agriculture there are important tasks: to develop and implement a sectoral system of labor protection management; to increase the efficiency of labor protection work at agricultural enterprises of all types of property; to provide employees with regulatory and labor protection laws, which take into account modern labor safety requirements; to intensify control over compliance with safety standards and working conditions in the workplace, paying particular attention to the technical aspects of occupational safety, etc. [12].

Analyzing the statistics of the State Labor Service of Ukraine for the period of 2011-2017, we have established that the state of occupational injuries is declining, both in Ukraine as a whole and in the field of agro-industrial complex (Fig. 1., Fig. 2.). The results of our studies are consistent with the data of Yu. Konovalov [16], Yu. Rogachev, A. Komar [20], R. Pakhomov, G. Gasy, I. Bilous, T. Lavrut [18].

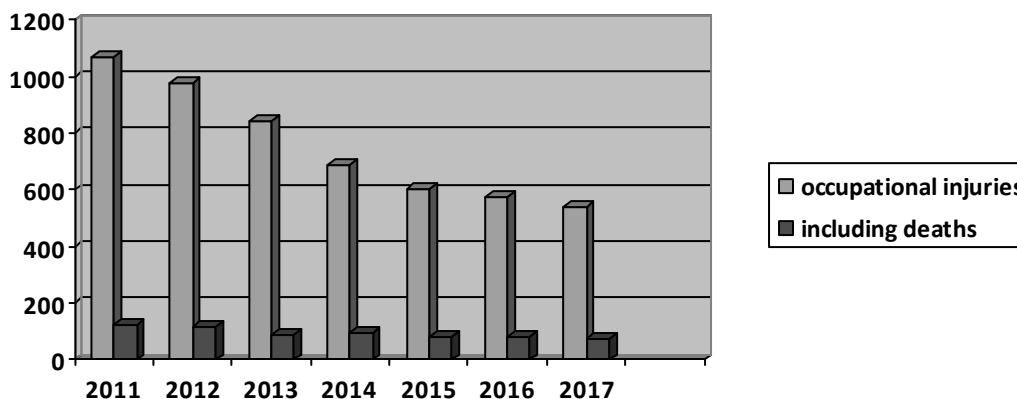
In the period of 2011-2017, the state of occupational injuries has decreased (Table 1) by 59,5% in all industries, including deaths by 46,6%, and by 81,7 and 85,7 respectively in the coal industry, in the energy sector – by 22,9 and 23,8, in the construction industry – by 54,6 and 29,9, in the field of boiler inspection, lifting facilities – by 56,8 and 18,2, in the mechanical engineering sector – by 65,3 and 29,6, in the metallurgy – held by 50,0 and 38,1, in the chemical industry – by 41,6 and 64,3, in the field of transport – by 32,2 and 18,8, in the branch of science in the gas industry – by 47,8 and 60,0, in the agro-industrial sector – by 49,6 and 39,0 in the field of social sphere and trade – by 34,4% and 52,1%. The higher percentage of injuries with fatalities in the above-mentioned period, we can observe in the branches of mining and non-metallurgy, oil and gas exploration, geological

exploration, wood processing industry and housing and communal enterprises, respectively – by 30,4, 60,0, 40,0 and 35,3%.



**Figure 1. Dynamics of occupational injuries at enterprises of Ukraine for the period of 2011-2017 years**

**The state of occupational injuries in the agro-industrial complex, including fatalities for the period 2011-2017**



**Figure 2. Dynamics of occupational injuries for the period 2011-2017 years in the agro-industrial complex of Ukraine**

Reducing the level of traumatism is the result of fruitful work of labor protection bodies working on improving and introducing measures to improve the state of safety, occupational health and working environment, in accordance with the «National Social Program for Improving the Safety,

Occupational Health and Work Environment for 2014-2018» [19] and a decrease in the number of economically active people of working age by 10,1% (Table 2.) (according to the State Statistics Service of Ukraine) [11].

Table 1

**The state of occupational injuries for the period 2011-2017 on branches of supervision (persons)**

Field of surveillance	2011		2012		2013		2014		2015		2016		2017	
	Total	including deaths	Total	including deaths	Total	including deaths	Total	including deaths	Total	including deaths	Total	including deaths	Total	including deaths
Coal	4255	161	3650	121	3147	100	2034	99	752	19	864	20	780	23
Mining and non-metallic	276	16	303	22	286	22	220	12	207	16	192	23	201	9
Oil and gas exploration and geology exploration	31	2	30	3	25	0	19	2	11	4	23	5	20	3
Energy	157	21	154	23	171	20	135	26	113	18	136	14	121	16
Construction	493	77	446	58	346	58	263	48	206	35	184	41	224	54
Boiler control, lifting structures	37	11	35	11	34	8	20	6	10	1	20	6	16	9
Engineering	969	27	881	27	688	29	507	23	311	21	313	19	336	19
Metallurgical	520	21	508	31	427	21	340	25	268	14	255	12	260	13
Chemical	219	14	231	8	198	19	132	15	137	16	146	10	128	5
Transport	580	80	566	74	496	70	423	71	396	54	364	70	393	65
Communication	92	3	67	2	90	5	74	8	60	8	60	1	57	2
Gas industry	67	5	58	9	51	4	51	8	48	2	36	2	35	2
Housing and communal services	279	22	250	31	248	27	171	9	141	14	167	34	155	17
Agro-industrial complex	1066	123	979	116	846	88	691	95	602	84	578	83	537	75
Woodworking industry	126	5	119	8	104	5	76	9	83	5	51	2	76	7
Light and textile industry	40	1	62	3	38	2	25	0	17	0	22	0	23	1
Social-cultural sphere and trade	1450	96	1477	76	1373	60	1137	92	898	64	1017	58	951	46
Total	10657	685	9816	623	8568	538	6318	548	4260	375	4428	400	4313	366

Despite the fact that the level of injuries in the above-mentioned years was declining, it should be noted that the agro-industrial complex in the

period 2011-2014 ranked third in Ukraine by the level of injury and second in terms of injuries in fatal cases, and in the period 2015-2017 years – third and first, respectively.

In 2011, in the agro-industrial sector, 10,0% of the total number of traumatized persons was injured at Ukrainian enterprises, and 17,9% of the total number of deaths were injured in 2012, respectively, 9,9% and 18,6% in 2013, respectively year – 9,9 and 16,4, for 2014 – 10,9 and 17,3, for 2015 – 14,1 and 22,4, for 2016 – 13,1 and 20,8 for 2017 – 12,5 and 20,5%.

The analysis of the data we have received shows that the level of industrial accidents with fatal consequences of agro-industrial complex of Ukraine ranks first in 2015-2017.

The «Concept on the organization of labor protection in the agrarian sector of the economy in the new economic conditions» states that the situation with injuries in the agrarian sector of the economy is due to a number of reasons, among which: violations of safety standards and the absence of effective mechanisms for bringing officials to account for non-compliance requirements of safety and safety of industrial products; reduction of the responsibility and exactingness of officials to monitor the observance of norms and rules of safety and the admission to work of workers in a drunken state; lack of funds, including funds for financing national, state, sectoral and regional programs on occupational safety, fire safety and road safety [15].

Table 2

**Labor Market Indicators (annual data) <sup>1</sup>**

Year	Economically active population			
	at the age of 15-70 years		able-bodied age	
	on average, thousand people	in % of the population of the corresponding age group	on average, thousand people	in % of the population of the corresponding age group

2010	20 894,1	63,6	19 164,0	71,9
2011	20 893,0	64,2	19 181,7	72,6
2012	20 851,2	64,5	19 317,8	72,9
2013	20 824,6	64,9	19 399,7	72,9
2014	19 920,9	62,4	19 035,2	71,4
2015	18 097,9	62,4	17 396,0	71,5
2016	17 955,1	62,2	17 303,6	71,1
2017 (1-9 months)	17900,4	61,4	17219,9	70,8

<sup>1</sup> Data for 2010-2014 are given without taking into account the temporarily occupied territory of the Autonomous Republic of Crimea and the city of Sevastopol, for 2015-2017 - also without part of the area of the anti-terrorist operation.

The State Labor Administration together with the Ministry of Agrarian Policy and Food of Ukraine, the Ministry of Ecology and Natural Resources of Ukraine, the Ministry of Health of Ukraine, the Social Insurance Fund for Industrial Accidents and Occupational Diseases should not only implement measures to improve the state of the economy, reduce the risk of production injuries, occupational diseases and accidents at work, but also monitor their implementation by employers.

The employer must, in accordance with current legislation, take effective measures in order to ensure safe working conditions in the conditions of production, since human health and life are the most important priority of universal values [15].

The effectiveness of the labor protection policy in the field of agro-industrial complex of Ukraine depends on the proper implementation of the National Social Program for improving the state of safety, occupational health and working environment for 2014-2018, namely: bringing normative legal acts on labor protection in line with the requirements of international and European legislation; improvement of the system of state supervision and public control over observance of the requirements of the legislation on labor protection and industrial safety; improvement of the system of state supervision and public control over observance of the requirements of the legislation on labor protection and industrial safety; increase of efficiency of

the systems of management of labor protection; prevention of occupational injuries, occupational diseases and accidents; raising the level of safety culture; introduction of economic incentives for improving the state of occupational safety; application of innovative technologies in the field of labor protection and industrial safety; development of new types of remedies; improvement of conditions and hygiene of labor; use of best practices on occupational safety issues [19].

Accordingly, state policy in the field of labor protection in the agrarian sector of the economy should be aimed at: creating conditions for safe living of the population of the country engaged in agro-industrial production, prevention of industrial accidents, elimination of their causes and social protection of victims; creation of a monitoring system for safe working life of the working population; creation and development of an appropriate production infrastructure and its management to ensure the safe living of the working population; strengthening of responsibility of officials, whose actions or inactivity which have become the main or concomitant cause of an accident [12].

**Conclusions and directions of further research.** On the basis of analysis of the data of the State Labor Service of Ukraine for the period of 2011-2017, it has been established that the state of occupational injuries is declining, both in Ukraine as a whole, and in the field of agro-industrial complex. Despite the fact that the level of injuries in the aforementioned years decreased, it should be noted that the industry of the agro-industrial complex in the period 2011-2014 took the third place in Ukraine by the level of injury and the second place – by the level of injury with fatalities, and in the period 2015-2017 years – the third and first place respectively.

In order to improve the work of the service on labor protection issues, it is continuously necessary to analyze the state of occupational injuries in the field of supervision. This will enable to prevent and eliminate potential

hazards. Therefore, in order to create safe and harmless working conditions, it is constantly necessary to improve the legal regulation of labor protection in agriculture, to update the rules, norms, standards, instructions, regulations in accordance with the development of STP and modern technical support of the agro-industrial complex.

To reduce occupational injuries, it is necessary to develop and implement a sectoral system of labor protection management; to increase the efficiency of labor protection work at agricultural enterprises of all types of property; to provide employees with regulatory and labor protection laws, which take into account modern labor safety requirements; to intensify control over compliance with safety standards and working conditions in the workplace, paying particular attention to the technical aspects of occupational safety; to apply the experience of the countries of the world.

**Literature:**

1. *Am. Acad. Pediatr. (2001). Prevention of agricultural injuries among children and adolescents. Pediatrics, 108 (4): 1016-1019. doi: 10.1542/peds.108.4.1016.*
2. *Karttunen, J.P., Rautiainen, R.H. (2013). Distribution and characteristics of occupational injuries and diseases among farmers: A retrospective analysis of workers' compensation claims. Am J Ind Med. 56 (8): 856-869. doi: 10.1002/ajim.22194.*
3. *Kim, H., Lee, K., Räsänen, K. (2016). Agricultural injuries in Korea and errors in systems of safety. Ann Agric Environ Med. 23 (3): 432-436. <https://doi.org/10.5604/12321966.1219182>.*
4. *Lower, T., Rolfe, M., Monaghan, N. (2017). Trends and Patterns in Unintentional Injury Fatalities in Australian Agriculture. J Agric Saf Health. 23 (2): 139-151. <http://dx.doi.org/10.13031/jash.12091>.*



5. McCurdy, S.A., Carroll, D.J. (2000). *Agricultural injury*. *Am J Ind Med.* 38 (4): 463-480.
6. Meyers, J., Miles, J., Faucett, J., Janowitz, I., Tejada, D., Kubashimi. J. (1997). *Ergonomics in agriculture: workplace priority setting in the nursery industry*. *Am. Ind. Hyg. Assoc. J.* 58 (2): 121-126.
7. Rautiainen, R., Reynolds, S. (2002). *Mortality and morbidity in the United States*. *J. Agric. Saf. Health* 2002 Aug, 8 (3): 259-276.
8. Schenker, M. (1996). *Preventive medicine and health promotion are overdue in the agricultural workplace*. *J. Public Health Policy.* 17 (3): 275-305.
9. Sprince, N., Park, H., Zwerling, C., Lynch, C., Whitten, P., Thu, K., et al. (2003). *Risk Factors for Animal-related Injury Among Iowa Large-livestock Farmers: A Case-control Study Nested in the Agricultural Health Study*. *J Rural Health Research.* 19 (2): 165-173. doi: 10.1080/15459620601067266.
10. Suutarinen, J. (2004). *Management as a risk factor for farm injuries*. *J Agric Saf Health.* 10 (1): 39-50.
11. Ukrstat.org – публікація документів Державної Служби Статистики України. URL:  
[https://ukrstat.org/uk/operativ/operativ2007/rp/ean/ean\\_u/osp\\_rik\\_b\\_07u.htm](https://ukrstat.org/uk/operativ/operativ2007/rp/ean/ean_u/osp_rik_b_07u.htm).
12. Войналович, О.В. (2011). *Актуальні завдання державного нагляду та контролю з охорони праці в сільському господарстві. Проблеми охорони праці в Україні : збірник наукових праць*. К. : ННДІПБОП, 168.
13. Дадашев, Б.А., Обливанцов, В.В., Гордієнко, В.П. (2008). *Система технологій АПК [Текст]: навчально-методичний посібник для самостійного вивчення дисципліни*. Суми : ДВНЗ «УАБС НБУ», 294.
14. Державна служба України з питань праці. URL:  
<http://dsp.gov.ua/category/diyalnist/travmatyzm-na-vyrobnytstvi>.

15. Каменська, І.С. (2014). Безпечність технологій та охорона праці в умовах виробництва та переробки продукції тваринництва. Вісник Сумського національного аграрного університету. Серія «Тваринництво». Суми: Сумський національний аграрний університет, 2/1 (24), 163-167.
16. Коновалов, Ю. (2010). Сучасні проблеми виробничого травматизму та професійної захворюваності в сільському господарстві України. Чинники розвитку аграрної економіки. Аграрна економіка. 3, 1-2, 94-103. URL: [http://irbis-nbuv.gov.ua/cgi-bin/irbis\\_nbuv/cgiirbis\\_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE\\_FILE\\_DOWNLOAD=1&image\\_file\\_name=PDF/ae\\_2010\\_3\\_1-2\\_18.pdf](http://irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&image_file_name=PDF/ae_2010_3_1-2_18.pdf).
17. Новак, Т.С. (2012). До питання забезпечення права на охорону праці у сільському господарстві. Вісник Академії адвокатури України. Київ, 3 (25), 228-230.
18. Пахомов, Р.І., Гасій, Г.М., Білоус, І.О., Лаврут, Т.В. (2015). Аналіз прогнозування та профілактика травматизму з важкими наслідками. Збірник наукових праць Харківського університету Повітряних Сил. Харків, 2 (43), 139-144.
19. Про затвердження Загальнодержавної соціальної програми поліпшення стану безпеки, гігієни праці та виробничого середовища на 2014-2018 роки. Закон України від 4 квітня 2013 року № 178-VII. URL: <http://zakon2.rada.gov.ua/laws/show/178-18> (Дата звернення 12.10.2017).
20. Рогач, Ю.П., Комар, А.С. (2013). Особливості професійної захворюваності в АПК України в сучасних умовах. Праці ТДАТУ. Мелітополь, 2013. 13, 6, 286-294.
21. Савченко, В. М., Цивенкова, Н.М., Савченко, Л.Г. (2016). Дослідження рівня виробничого травматизму та професійної

захворюваності в галузі технічного сервісу АПК України. Технічний сервіс агропромислового, лісового та транспортного комплексів. Харків, 6, 100-105.

22. Савченко, Л.Г., Цивенкова, Н.М., Савченко, В.М. (2016). Дослідження рівня виробничого травматизму і профзахворюваності в галузі тваринництва та переробки продукції тваринництва АПК України. Подільський вісник: сільське господарство, техніка, економіка. Технічні науки. Кам'янець-Подільський, 25, 115-122.

23. Травматизм на виробництві у 2014-2015 рр. Державна служба статистики України. URL: <http://www.ukrstar.gov.ua/>.

### **References:**

1. Am. Acad. Pediatr. (2001). Prevention of agricultural injuries among children and adolescents. *Pediatrics* 108 (4): 1016-1019. doi: 10.1542/peds.108.4.1016.

2. Karttunen, J., Rautiainen, R. (2013) Distribution and characteristics of occupational injuries and diseases among farmers: A retrospective analysis of workers' compensation claims. *Am J Ind Med.* 56 (8): 856-869. doi: 10.1002/ajim.22194.

3. Kim, H., Lee, K., Räsänen, K. (2016) Agricultural injuries in Korea and errors in systems of safety. *Ann Agric Environ Med.* 23 (3): 432-436. <https://doi.org/10.5604/12321966.1219182>.

4. Lower, T., Rolfe, M., Monaghan, N. (2017) Trends and Patterns in Unintentional Injury Fatalities in Australian Agriculture. *J Agric Saf Health.* 23 (2): 139-151. <http://dx.doi.org/10.13031/jash.12091>.

5. McCurdy, S., Carroll, D. (2000) Agricultural injury. *Am J Ind Med.* 38 (4): 463-480.

6. Meyers, J., Miles, J., Faucett, J., Janowitz, I., Tejeda, D., Kubashimi, J. (1997). Ergonomics in agriculture: workplace priority setting in the nursery industry. *Am. Ind. Hyg. Assoc. J.* 58 (2): 121-126.

7. Rautiainen, R., Reynolds, S.. (2002) *Mortality and morbidity in the United States. J. Agric. Saf. Health* 8 (3): 259-276.
8. Schenker, M. (1996). *Preventive medicine and health promotion are overdue in the agricultural workplace. J. Public Health Policy.* 17 (3). 275-304.
9. Sprince, N., Park, H., Zwerling, C., Lynch, C., Whitten, P., Thu, K., et al. (2003) *Risk Factors for Animal-related Injury Among Iowa Large-livestock Farmers: A Case-control Study Nested in the Agricultural Health Study. J Rural Health Research.* 19(2): 165-173. doi: 10.1080/15459620601067266.
10. Suutarinen, J. (2004) *Management as a risk factor for farm injuries. J Agric Saf Health.* Jan; 10 (1):. 39-50.
11. Ofitsiinyi sait Ukrstat.org – publikatsiia dokumentiv Derzhavnoi Sluzhby Statystyky Ukrainy. [Ukrstat.org – publication of documents of the State Statistics Service of Ukraine]. Retrieved from [https://ukrstat.org/uk/operativ/operativ2007/rp/ean/ean\\_u/osp\\_rik\\_b\\_07u.htm](https://ukrstat.org/uk/operativ/operativ2007/rp/ean/ean_u/osp_rik_b_07u.htm) [in Ukrainian].
12. Voinalovych, O.V. (2011) *Aktualni zavdannia derzhavnoho nahliadu ta kontroliu z okhorony pratsi v silskomu hospodarstvi [Actual problems of state supervision and control of labor protection in agriculture.] Problemy okhorony pratsi v Ukraini. Zbirnyk naukovykh prats. – Problems of labor protection in Ukraine. Collection of scientific works. K.: 21. 168 [in Ukrainian].*
13. Dadashev, B.A., Oblyvantsov, V.V., Hordiienko, V.P. (2008) *Systema tekhnolohii APK [Tekst]: navchalno-metodychnyi posibnyk dlia samostiinoho vyvchennia dystsypliny [The system of technologies of agrarian and industrial complex [Text]: a methodical manual for independent study of a discipline.] Sumy: DVNZ «UABS NBU», 294 [in Ukrainian].*

14. *Ofitsiynyi sait Derzhavna sluzhba Ukrainy z pytan pratsi. [State Service of Ukraine on Labor.] Retrieved from <http://dsp.gov.ua/category/diyalnist/travmatyzm-na-vyrobnytstvi>. [in Ukrainian].*

15. Kamenska, I.S. (2014) *Bezpechnist tekhnolohii ta okhorona pratsi v umovakh vyrobnytstva ta pererobky produktsii tvarynnytstva [Safety technology and health in the production and processing animal products.] Visnyk Sumskoho natsionalnoho ahrarnoho universytetu. Seriiia «Tvarynnytstvo». – Bulletin of the Sumy National Agrarian University. Series «Animal husbandry». Sumy : Sumskyi natsionalnyi ahrarnyi universytet. 2/1 (24), 163-167 [in Ukrainian].*

16. Konovalov, Yu. (2010) *Suchasni problemy vyrobnychoho travmatyzmu ta profesiinoi zakhvoriuvanosti v silskomu hospodarstvi Ukrainy. [Actual problems of the occupational accidents and morbidity in agriculture of Ukraine.], Chynnyky rozvytku ahrarnoi ekonomiky. Ahrarna ekonomika. – Factors in the development of agrarian economics. Agrarian Economics. T. 3. 1-2. 94-103. Retrieved from [http://irbis-nbuv.gov.ua/cgi-bin/irbis\\_nbuv/cgiirbis\\_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE\\_FILE\\_DOWNLOAD=1&Image\\_file\\_name=PDF/ae\\_2010\\_3\\_1-2\\_18.pdf](http://irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&Image_file_name=PDF/ae_2010_3_1-2_18.pdf). [in Ukrainian].*

17. Novak, T.S. (2012) *Do pytannia zabezpechennia prava na okhoronu pratsi u silskomu hospodarstvi. [To the issue of ensuring the right to health protection in agriculture.] Visnyk Akademii advokatury Ukrainy – Bulletin of the Academy of Advocacy of Ukraine. 3 (25). 228-230 [in Ukrainian].*

18. Pakhomov, R.I., Hasii, H.M., Bilous, I.O., Lavrut T.V., et al (2015) *Analiz prohnozuvannia ta profilaktyka travmatyzmu z vazhkymy naslidkamy. [Analysis, prediction and prophylaxy of traumatism with serious consequences] Zbirnyk naukovykh prats Kharkivskoho universytetu*

*Povitrianykh Syl. – Collection of scientific works of Kharkiv University of Air Forces. Kharkiv, 2 (43). 139-144 [in Ukrainian].*

19. *Ofitsiyni sait Pro zatverdzhennia Zahalnodержavnoi sotsialnoi prohramy polipshennia stanu bezpeky, hihiieny pratsi ta vyrobnychoho seredovyshcha na 2014-2018 roky. Zakon Ukrainy vid 4 kvitnia 2013 roku # 178-VII. [On Adopting the National Social Program for Improvement of Safety, Workplace Hygiene and Production Environment in 2014 – 2018: Law of Ukraine on April 4, 2013 № 178-VII.] Retrieved from <http://zakon2.rada.gov.ua/laws/show/178-18> [in Ukrainian].*

20. *Rohach, Yu.P., Komar, A.S. (2013) Osoblyvosti profesiinoi zakhvoriuvanosti v APK Ukrainy v suchasnykh umovakh. [Features occupational diseases in modern conditions of agriculture of Ukraine] Pratsi TDATU. – Proceedings of the Tavria State Agrotechnological University Melitopol. 13, 6. 286-294 [in Ukrainian].*

21. *Savchenko, V. M., Tsyvenkova, N.M., Savchenko, L.H. (2016) Doslidzhennia rivnia vyrobnychoho travmatyzmu ta profesiinoi zakhvoriuvanosti v haluzi tekhnichnoho servisu APK Ukrainy [Researching the level of production traumatism and professional sickness in the trade of technical service of the agrarian complex of Ukraine.] Tekhnichniy servis ahropromyslovoho, lisovoho ta transportnoho kompleksiv. – Technical service of agriculture, forestry and transport systems. Kharkiv. 6.. 100-105 [in Ukrainian].*

22. *Savchenko, L.G., Tsyvenkova, N.M., Savchenko, V.M. (2016) Doslidzhennia rivnia vyrobnychoho travmatyzmu i profzakhvoriuvanosti v haluzi tvarynnytstva ta pererobky produktsii tvarynnytstva APK Ukrainy. [Research on the level of production traumatism and professional sickness in the field of animals husbandry of agrarian and industrial complex of Ukraine]. Podilskyi visnyk: silske hospodarstvo, tekhnika, ekonomika.*

*Tekhnichni nauky. – Podilian Bulletin: agriculture, engineering, economics. Technical sciences. Kamianets-Podilskyi. 25. 115-122 [in Ukrainian].*

23. *Ofitsiyniy sait Travmatyzm na vyrobnytstvi u 2014-2015 rr. Derzhavna sluzhba statystyky Ukrainy. [Traumatism in production in 2014-2015. State Statistics Service of Ukraine.] Retrieved from <http://www.ukrstar.gov.ua/> [in Ukrainian].*