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Threats and Safety of Life of Rural Population

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Annotation: The article provides information on the state of training of agricultural managers and workers in occupational safety issues, special assessment of workplaces, as well as data on the state of injuries with serious consequences in agriculture and its branches, on the most hazardous professions and types of work in agriculture.

Keywords: agriculture, injuries, special assessment, training.

As a result of the active demographic policy pursued by the state, an increase in the population of the Federation of Uzbekistan is registered. Moreover, the increase is due to the growth of the urban population, while the rural population continues to decline. In 2014, the rural population decreased by 110.6 thousand people or 0.3% compared to the previous year [1]. At the same time, there is an annual decrease in the number of both urban and rural populations of working age, the reasons for which are the high mortality rate due to diseases of the circulatory system, with mortality from them higher among the rural population than among the urban population, as well as malignant neoplasms and external causes, which include poisoning, accidents, and road accidents [2]. Compared to the previous year, the number of urban population of working age decreased by 561.6 thousand.

At the same time, scientists believe that working conditions in agricultural organizations are extremely unsatisfactory, since workers are exposed to a whole range of harmful and dangerous production factors. The health of agricultural workers is negatively affected by heavy physical labor, increased noise and vibration levels, unfavorable microclimatic conditions, and various chemical and biological substances. In addition, agriculture differs from other types of economic activity in the seasonality of work [3].

According to a number of foreign researchers, farmers and their family members, as well as other agricultural workers, face greater risks at work than most workers in other industries. Many accidents are associated with the handling of animals in livestock buildings. When carrying out agricultural field work, the cause of accidents is the operation of tractors. Grain harvesters, forage processing machines and other types of equipment are also the cause of numerous injuries [4]. At the same time, the working conditions of agricultural workers are practically not monitored and are not presented in any form of statistical reporting, unlike other industries, such as manufacturing and distribution of electricity, gas and water, construction, transport and communications.

According to state statistics of Uzbekistan, in agricultural economic entities over the past five years (2010 - 2014), the number of victims at work has decreased by 2952 people, which is 48.0% [5]. The reduction in the number of victims occurred against the background of a steady reduction in the number of workers, which over the same period of time decreased by 21.1% (Fig. 1).

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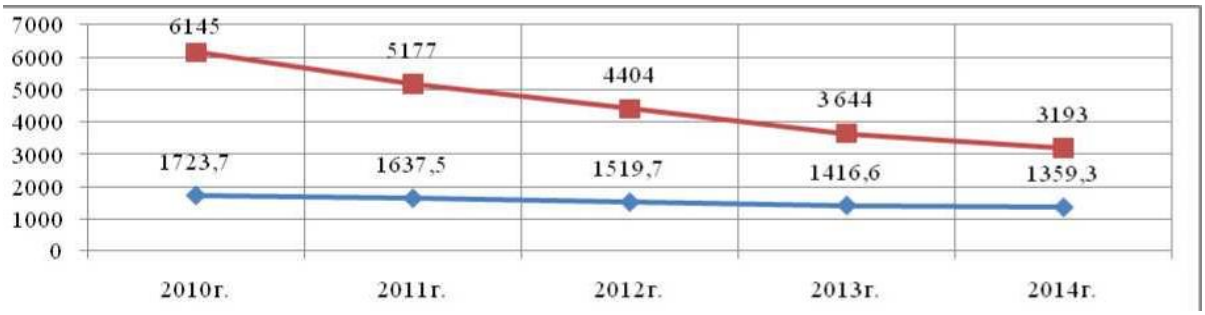
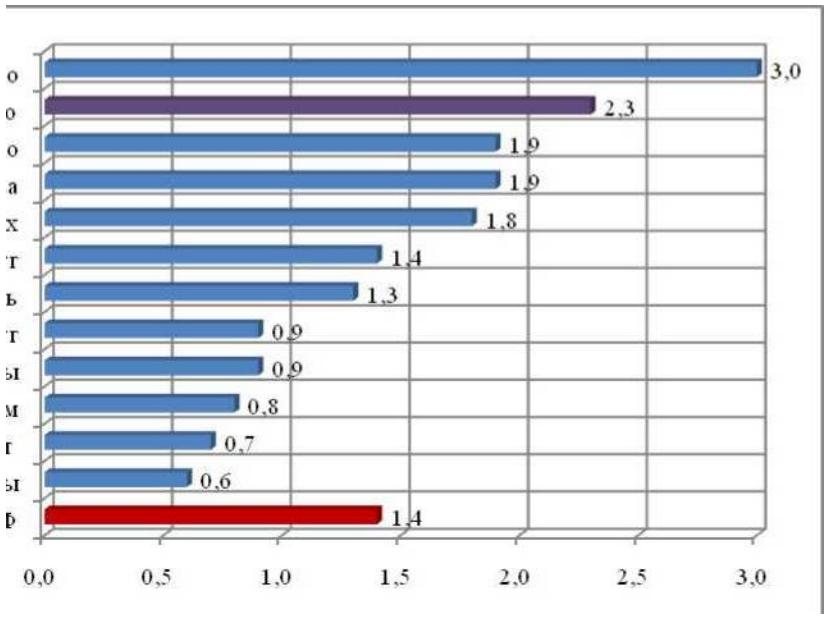
Figure 1 - Dynamics of the reduction in the number of people employed in agriculture and victims of accidents



Despite the reduction in the absolute number of victims, the level of general injuries in agriculture, hunting and forestry in 2020 was one of the highest among all types of economic activity and exceeded the average in Uzbekistan by 1.6 times (Fig. 2).

Figure 2 - General injury rate in the main types of economic activity in 2020



Agriculture is one of the most hazardous types of economic activity and, in terms of the share of accidents with serious consequences, is on par with such traditionally hazardous types of activity as manufacturing, construction and transport [6].

Agriculture, hunting and forestry have some of the highest rates of fatal injuries, second only to construction and mining (Figure 3).

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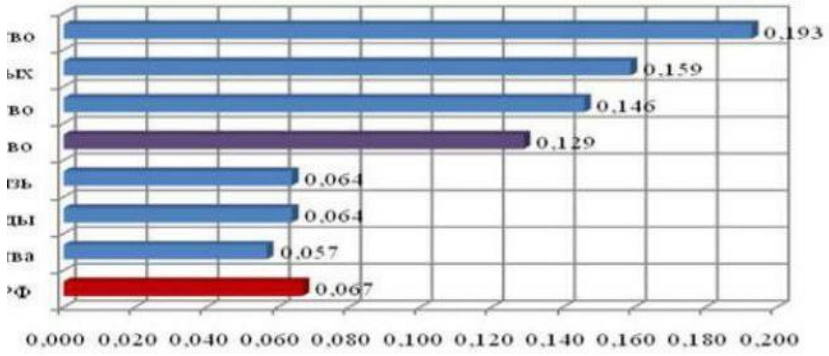
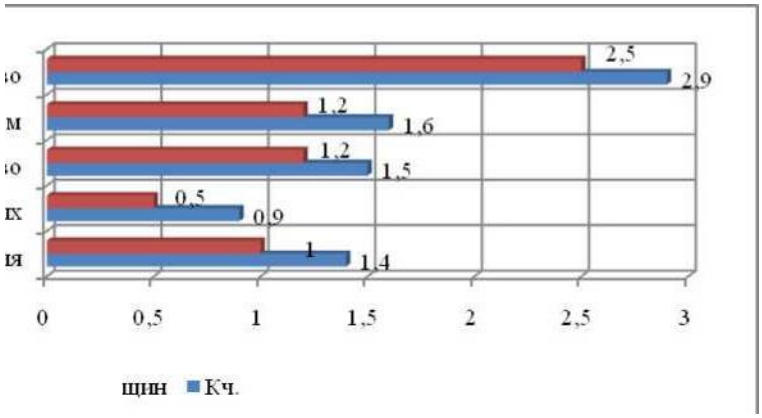
Figure 3 - Fatal injury rate in major economic activities in 2020,



In terms of the absolute number of people diagnosed with an occupational disease for the first time, agriculture, hunting and forestry are in fourth place among other types of economic activity. The largest number of newly diagnosed occupational diseases is registered in livestock farming and plant growing (53.4% and 43.4%, respectively).

Among the agricultural sectors, the most dangerous are livestock farming and crop production (Fig. 4). In 2020, they registered a 1.7-fold excess of the average Russian level of fatal injuries.

Figure 4 - Level of general industrial injuries in the main branches of agriculture in 2014, including among women



At the same time, the highest level of injuries among women is observed in animal husbandry, which in 2020 exceeded the average for Uzbekistan by 2.5 times (Fig. 4). As the analysis of accident investigation materials shows, the most hazardous professions in animal husbandry are: livestock breeder, agricultural tractor driver, milkmaid, shepherd, livestock farm equipment fitter, and auxiliary worker (Fig. 5). More than 80% of fatal injuries and more than 70% of severe injuries in animal husbandry are caused by workers in these professions.

Most often, livestock workers receive fatal and serious injuries while performing basic technological operations (about 40.0% of the total number of victims in livestock farming), namely, while caring for animals, preparing and distributing feed, cleaning manure, milking, as well as while performing transportation, as a result of which up to 25.0% of workers are injured, of which about 7.0% of workers are directly injured during their transportation to and from work [7].

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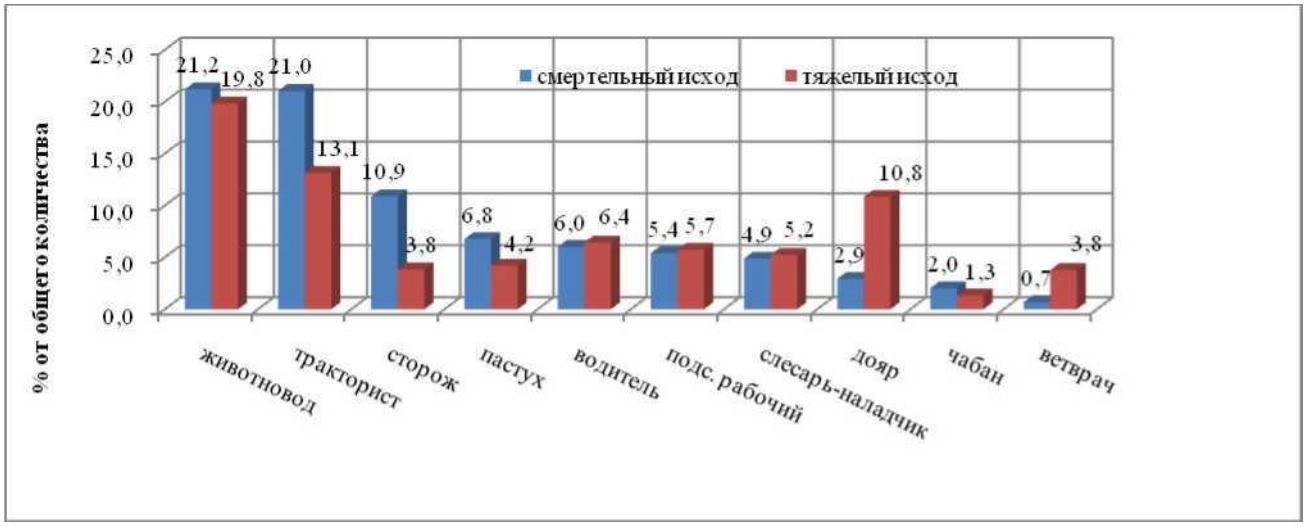
Figure 5 - The most hazardous professions in animal husbandry



The risk of injury is also posed by repair and maintenance work on livestock machinery and equipment. Workers are most often injured as a result of blows from non-standard or faulty tools and fragments flying off when striking the equipment being repaired, as well as being caught by rotating and moving parts of machinery and equipment.

Among the equipment of livestock farms, the most dangerous in terms of fatal and severe injuries are manure removal units. Mostly, mechanics and cattlemen who perform manure removal, repair and maintenance of manure removal units are injured. Stationary and trailer feed distributors also pose a risk of injury.

Equipment that poses a risk of injury includes feed crushers, mainly KDU-2.0, and feed preparation units. Accidents occur when workers are in the area of rotating and moving parts during the feeding of raw materials into receiving chambers, eliminating blockages, and cleaning the working parts of crushers and feed preparation units.

Livestock workers suffered serious injuries as a result of falls on surfaces (3.8%). Falls occur in cowsheds, calf houses and adjacent areas. The cause of the falls was the slippery condition of the floors of the premises, pedestrian paths, and the area.

Thus, the determining factors for fatal and severe injuries to livestock workers are:

- lack of protective guards for moving and rotating parts equipment;
- malfunction of protective fences;
- malfunction of machines, mechanisms, tools and devices;
- organization of workplaces that does not meet labor protection requirements;
- Deficiencies in the instruction and training of workers in safe working methods, in the management and supervision of compliance with labor protection requirements and labor discipline.

In plant growing, during industrial cultivation of plants, the most frequently injured are tractor drivers - agricultural machinery operators, whose share is up to 74.0% of the total number of victims in plant growing, and auxiliary workers - 16.5%; cases of fatal and severe injuries to mechanics - repairmen, car drivers, greenhouse workers, vegetable growers, waterers, gardeners are also recorded (Fig. 6).

Figure 6 - The most hazardous professions in plant growing

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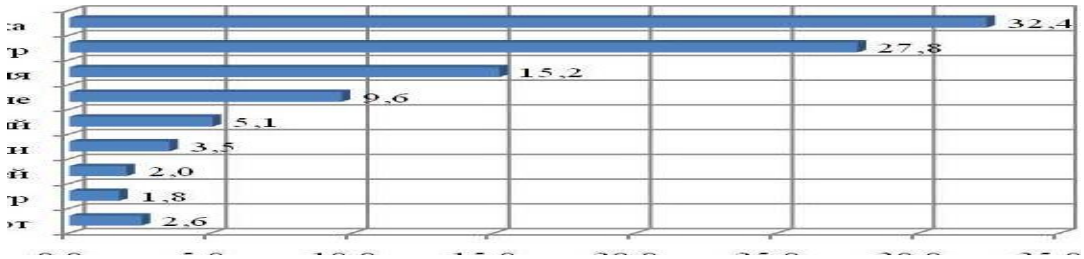
The most hazardous types of work in industrial plant cultivation include soil cultivation, plowing, cultivation, harrowing, as well as the application of organic and mineral fertilizers, soil liming, crop and plant care, dusting and spraying plants to protect them from pests and diseases (Fig. 7).

Figure 7 - Distribution of the proportion of victims in industrial plant cultivation by type of work performed at the time of the accident



Most often, accidents occur on tractors aggregated with plows, harrows, cultivators, seeders, and fertilizer application machines.

During harvesting and post-harvest processing of crop products, 75% of accidents are related to the operation and maintenance of wheeled and tracked tractors, self-propelled grain and forage harvesters, and trucks. Most often, accidents with serious consequences occur during the operation of wheeled tractors of the MTZ-80 and MTZ-82 brands, which are in aggregate with balers PS-1.6; PSB-1.6, PRP-1.6; PPL-1.6; trailed mowers KTP-6, KIR-1.5; KIR-1.5B, potato harvesters KKU-2A; E-667/2; E-668/7, machines for harvesting hay and straw.

Among stationary machines, the greatest risk of injury in plant growing is posed by grain cleaning and sorting machines of the ZAV-20, SM-4, KZS-20 brands, grain dryers, feed crushers KDU-2.0 and DKU-10, seed treater PS-1

Reducing the level of industrial injuries and occupational diseases in agriculture is one of the priority tasks in the area of preserving the life and health of agricultural workers. In order to solve it effectively, it is necessary, first of all, to know the true scale of the problem.

The basis of all human existence is labor activity, however, preserving the life, health and ability to work of workers in the production process does not happen by itself, but requires knowledge of labor protection and the ability to work in compliance with safety rules.

The main goal of occupational safety training is to prevent industrial injuries and occupational diseases.

Numerous studies of the causes of industrial injuries (and accidents), as well as acute occupational diseases, have made it possible to divide the entire diversity of these adverse events into three main groups.

The first group of reasons is associated with incorrect actions of the direct performer of a particular work process - an individual employee.

The second group of reasons is related to the incorrect organization of work (that is, incorrect actions of the joint contractor - the employer's employees)

The third group of reasons is related to equipment malfunctions and failures or unstable technological process.

The main causes of chronic occupational diseases are unfavorable working conditions caused by the technical impossibility and/or economic inexpediency of implementing another technological process, failure by the employee (and employer) to use personal protective equipment and other safety measures (for example, time protection, periodic medical examinations, etc.). Ultimately, the main

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culprit of a particular adverse incident is a person (usually someone's employee) because it is he who "did not do something" or "did not do it the right way." We emphasize that, strictly speaking, purely technical reasons simply do not exist, or they are only intermediate stages between certain incorrect actions of certain workers and the consequences of these actions [8, 9].

In addition, we must not forget that safe work presupposes the physical and psychological readiness of the employee to work “according to the rules” and perform his/her functions in accordance with labor protection requirements, having a sufficient level of professional literacy and conscious motivation.

World statistics inexorably show that the overwhelming majority (up to 80%) of the main causes of industrial injuries and accidents are the “human factor”.

Since it is fundamentally impossible to completely eliminate hazards through technical and organizational measures, the worker's safety is often determined only by his behavior. Prevention of personal (psychological and psychophysiological) causes of injury is associated with the selection of personnel, as well as with continuous training, instruction and education of the worker, stimulating his safe behavior [10].

To ensure that workers have the necessary understanding of all the risks, potential hazards and hazardous equipment present in the workplace and are able to know when they are exposed to a particular hazard and what the consequences of their actions may be, appropriate education, training (education and drill) and work experience are required.

World and Uzbek experience shows that training workers in safe work practices, occupational safety requirements, and first aid to victims is the most important preventive measure for preventing cases of industrial injuries and occupational diseases.

Practice shows that in order to implement real training, it is necessary to put first the goals and objectives of training, its content, its determinacy by the nature of the work activity performed by the work function.

An analysis of cases of industrial injuries in agricultural production shows that in more than 70% of cases, the victims were not trained in occupational safety issues, they were not briefed on occupational safety and health, and did not undergo training. This is due to the fact that a large mass of producers are not united in large holdings. Individual entrepreneurs and heads of peasant farms are few in number. When registering them, occupational safety documents are not required. As a result of fragmentation, these entities of agricultural production are left to their own devices. The implementation of Federal Law No. 486-FZ "On Special Assessment of Working Conditions" is proceeding at a slow pace. Research on this issue shows that, compared to other industries, the pace of this work is 8 times lower. In the future, there is a pressing need to reform the entire agricultural production system at the state level.

In the current occupational safety management system, only accidents that lead to temporary disability for one day or more or permanent disability or death are subject to investigation and recording. However, as research practice shows, for every accident there are a significant number of minor and light injuries, cases of first aid and incidents, of which only a few turn into accidents with serious injuries or fatalities (Table 1) [11].

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Table 1 - Proportion of grass species and the number of injury cases*	
Event type	Number of cases
Fatal outcome	1
Severe injuries	10-30
Minor injuries	100-300
Providing first aid	1000-3000
Incidents	10000-30000

Accidents subject to investigation make up no more than 2-5% of the total number of incidents, the investigation of which is not provided for by the current legislation. At the same time, only a detailed analysis of such situations will allow us to identify and fully assess the cause-and-effect relationships in the system "professional activity - professional risk" in order to prevent it. In modern society, the policy in the field of labor protection and professional health care should be formed on the basis of a comprehensive consideration of the maximum possible range of facts and phenomena of real working life. The Federal Service for Labor and Employment monitors the types and causes of fatal and serious accidents, while accidents with temporary disability, as well as accidents that do not result in loss of ability to work, are practically not studied and not prevented.

The existing systems of collecting and processing statistical data in Uzbekistan, transferring information from the regional to the federal level in the field of safety and working conditions do not provide the required content and quality of information necessary for the full functioning of the risk management system. The bodies involved in the system of state regulation in the field of labor protection receive, process and issue information exclusively within the framework of their powers in accordance with the direction of their activities. While there are investigation materials compiled for all cases of fatal, severe and group injuries of workers, which contain a huge amount of multilateral information about accidents that have already occurred, the conditions and causes of their occurrence, established by a qualified group of specialists in the field of labor protection. Unfortunately, this information currently remains unclaimed in full. And the current forms of statistical reporting do not provide the ability to enter and systematize the data necessary for a full analysis of the causes and circumstances of industrial injuries [12].

One method of identifying injury risks is to evaluate past accidents. Obviously, the fact that some accidents have never occurred in a given enterprise does not exclude that they will not occur in the future. Therefore, it is essential for employers who are responsible for implementing effective preventive strategies and safety procedures to have access to other sources of information to prevent accidents that have occurred in similar industries. In addition, the employer must be sure that the preventive measures taken previously to reduce the risks were sufficient. However, if an accident at work nevertheless occurs, the employer must analyze the reasons why the preventive measures were insufficient to prevent the accident.

Currently, there are occupational injury databases operating in the EU, America, Canada, and Germany. EU member states must submit a diverse volume of information on occupational injury cases to form injury databases, containing information on the enterprise, institution, its location, economic activity, number of employees, as well as information on the injured person, his/her gender, age, profession, employment status, information on the injury, namely, the outcome of the injury, the type of injury, body part, type of wound, information on the accident and its circumstances, characteristics of the scene, date and time of the accident, as well as information on physical contact

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with the element or object that caused the injury or psychological damage from the incident, and other information [13, 14].

The statistical reporting forms in force in Uzbekistan do not provide for the interrelation and correlation of injury rates with the professional affiliation of the victims. Thus, the number of transport accidents in the agricultural sector or falls from heights do not allow us to assess which workers of which professions or professional groups are exposed to these dangers and what needs to be done to reduce these risks. Information on the causes, types and circumstances of accidents by industry and type of economic activity of enterprises or organizations is of interest mainly to the Social Insurance Fund when establishing "professional risk classes" of legal entities and the corresponding insurance rates for compulsory social insurance against industrial accidents and occupational diseases.

The reporting forms, which provide information necessary for conducting all-Russian monitoring of working conditions and labor protection, are also formed on the basis of types of economic activity (OKVED) and subjects. In this context, individual professional risks of employees of organizations do not correlate at all with their professional affiliation and the conditions of the accident [15,16]. To characterize complex phenomena, a corresponding comprehensive description is required, which cannot be provided using only statistical indicators. It is also necessary to combine quantitative and qualitative information in order to create a complete and comprehensive picture of the state and trends in the development of labor safety and hygiene systems on a national scale, its subjects and types of economic activity.

Thus, at present, it is extremely important to improve the mechanisms for collecting, analyzing and disseminating information on the state of industrial injuries and occupational diseases of workers, and to develop a Database of industrial injuries corresponding to foreign analogues. In agro-industrial production, there is a Database of Fatal and Severe Injuries in the AIC of Uzbekistan registered by the Federal Service for Patents and Trademarks, similar to foreign ones, which contains detailed information on 2.5 thousand industrial accidents for the period from 2000 to 2020. Currently, there is a need to update the Database of Industrial Injuries in Agriculture. The existing Database is universal and can be used after revision for all types of economic activity.

Since 2007, Uzbekistan has registered an almost annual increase in the severity of accidents. In agriculture, hunting and forestry in 2020, the victim of one accident was absent from work for an average of 46.0 days. The greatest severity of accidents is recorded in the provision of services in the field of crop production, ornamental gardening and livestock farming, as well as in crop production and livestock farming.

Thus, agriculture remains one of the most complex and hazardous types of economic activity. In the context of negative demographic trends, expressed in the reduction of the rural population of working age, the tasks of forming effective mechanisms for creating safe working conditions remain one of the priority areas of socio-economic development in Uzbekistan.

At the same time, individual employers in agricultural organizations, in violation of current legislation, do not ensure the creation of labor protection services, do not allocate sufficient funds to improve the working conditions and labor protection of workers, do not comply with the established deadlines for training and testing knowledge of labor protection requirements, allow the operation of industrial buildings and structures, machinery and equipment that do not meet safety requirements, and do not fully provide workers with personal protective equipment.

Thus, the main areas for improving labor safety in agricultural organizations are:

- conducting scientific research and developing regulatory legal documents in the field of labor protection for workers in agriculture and the processing industry (Rules for labor protection in the dairy industry, Rules for labor protection in the meat industry, Rules for labor protection during

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storage and processing of fruit and vegetable products, Rules for labor protection in organizations for the storage and processing of grain, Rules for labor protection for agricultural workers when using pesticides and agrochemicals);

- intensification of work on conducting a special assessment of workplaces in agricultural organizations;
- increasing the competence of employers in the field of labor protection by increasing the quality and quantity of training for managers and specialists of organizations on labor protection issues;
- monitoring working conditions and safety in agricultural organizations, informing employees about the results of the implementation of measures to improve working conditions;
- Improvement of the occupational safety management system in agricultural production. Creation of occupational safety services in agricultural organizations with more than 50 employees;
- In order to attract attention to occupational safety issues and to stimulate educational institutions to organize research work in the field of occupational safety, it is necessary to provide for holding competitions for the best student workwork on technosphere safety, life safety and labor protection;
- ensuring that the personnel of organizations are informed about the risks associated with the performance of work duties, and developing in workers a priority attitude towards preserving life and health when performing the production process;
- Updating and implementation of the Database "Industrial injuries with fatal and severe outcomes in the agro-industrial sector" production in Uzbekistan."

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