



AgriSafetyNet

Agricultural Safety Through Lifelong Learning

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Module 1

BASIC CONCEPTS OF OCCUPATIONAL HEALTH & SAFETY



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Module 1 - Basic concepts of occupational health & safety in Agriculture

0. Dictionary of some key concepts used in the module

HEALTH

health is the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations [International Labour Organisation]

OCCUPATIONAL HEALTH

occupational health should aim at: the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities; and, to summarize, the adaptation of work to man and of each man to his job [International Labour Organisation; World Health Organization]

OCCUPATIONAL HEALTH AND SAFETY

Occupational health and safety is the field of public health that studies trends in illnesses and injuries in the worker population and proposes and implements strategies and regulations to prevent them. Its scope is broad, encompassing a wide variety of disciplines—from toxicology and epidemiology to ergonomics and violence prevention [The University of Iowa]

OCCUPATIONAL HAZARD

occupational hazard is a hazard experienced in the workplace. Occupational hazards can encompass many types of hazards, including chemical hazards, biological hazards (biohazards), psychosocial hazards, and physical hazards [United States Department of Labor]

OCCUPATIONAL DISEASE

An “occupational disease” is any disease contracted primarily as a result of an exposure to risk factors arising from work activity. “Work-related diseases” have multiple causes, where factors in the work environment may play a role, together with other risk factors, in the development of such diseases [World Health Organization]

1. Work & Health

Agriculture is known to be one of the most important sectors worldwide - in terms of supplying foods - but also in terms of employing a number of workers. Agriculture is one of the sector with high risk of exposure to factors or work conditions that influence health. Agriculture as a sector employs about one billion workers and is considered as one of the most hazardous sectors in both developing and developed countries. It has very high rates of accidental deaths, work-related illnesses and injuries.

Before we will move on to discussing health in relation to agriculture, we will just mention what health and occupational health is in general.

The International Labour Organisation says that **“health is the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations”** (International Labour Organisation – ILO). In other words, health is what keeps you mentally and physically fit and content.

The International Labor Organization and the World Health Organization have shared a common definition of occupational health that is **“occupational health should aim at: the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities; and, to summarize, the adaptation of work to man and of each man to his job”** (Encyclopaedia of occupational health and safety).

So, in conclusion, health and safety issues focus on the following points and deal with:

- minimum standards for workplaces
- vibration
- asbestos
- electromagnetic fields
- biological, chemical and physical agents
- pregnant workers and young people
- visual display units

- personal protective equipment
- noise
- manual handling
- work equipment
- signs
- mobile sites (construction).

Accidents at work in agriculture are a big problem. Farmers, family members, farm workers and rural children are at greater risk than in most other occupations. Accidents involve handling livestock. Accidents involving also tractors, trailers, harvesters, forage processing machines and other equipment often occur in agricultural field work. Also in horticultural and forestry work, people are exposed to considerable safety risks.

2. Work hazard

Work hazard is situation with the potential to harm a worker. Work hazards can be divided into two main categories. One is safety hazards that cause accidents that physically injure workers, and second is health hazards which result in the development of disease. Lucky, awareness of the farmers' safety and health is growing amongst safety professionals. Agricultural occupations requires really good information on their safety and health risks.

Risk hazard is the process of checking and evaluating the health and safety risks from workplace hazards.

It is a constant and systematic examination of all work aspects. What has to be consider:

- whether the hazards could be eliminated;
- what could cause injury or harm;
- which preventive or protective measures are or should be in place to control the risk (European Agency for Health and Safety at Work: <http://osha.europa.eu/en>).

There are 5 steps in carrying out risk assessment:

1 Identification and recording of hazards

2 Assessment of hazards to determine the risk level

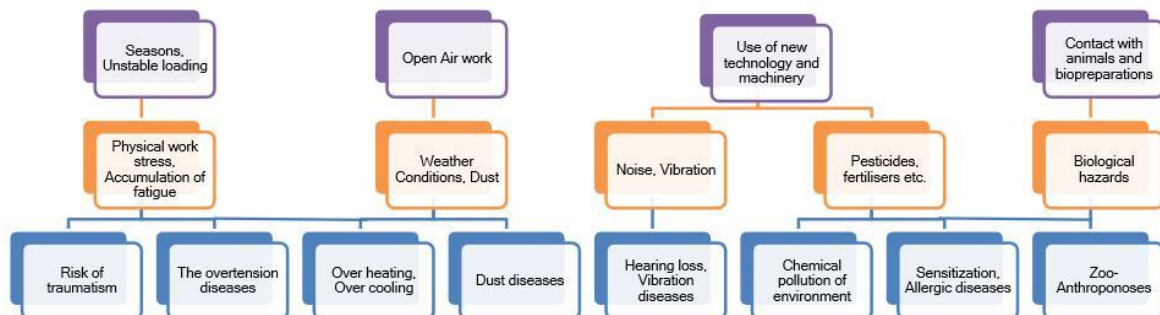
3 Determination of preventive and protective measures

4 Taking action

5 Monitoring and reviewing

Workers who are those carrying out the work activities are most exposed to hazards. Where hazards are not controlled at the work place workers are exposed to:

- be injured in an accident;
- be disabled;
- contract a disease;
- die.



Source: <https://slideplayer.com/slide/6271563/>

Regarding to work hazard in agriculture, this includes chemical agents (plant protection products and fertilizers), biological agents (infectious microorganisms, parasites as well as sensitizing), and threats connected with the effect of various physical factors. Agricultural workers are injured in workplace accidents involving agricultural machinery, poisoned by pesticides and other agrochemicals.

Working in agriculture is physically very demanding by nature. The risk of accidents increases farmers' fatigue, poorly designed or old tools, difficult terrain (steep, wet), exposure to extreme weather conditions. These problems are compounded by the fact that in the countryside working and living conditions interweave with each other, people do not end up working in the field after 8 hours as it is in other occupations. Subsistence farmers, agricultural contractors and their families live in rural areas where there are many environmental side effects associated with the above-mentioned occupational hazards. Usually very long working hours, using equipment and machines with a high potential for inflicting serious harm and exposure to extreme weather conditions could indeed, create a very dangerous working environment. It should also be noted that unfortunately many workers are employed on a seasonal basis and very often illegally. Workers in agriculture are almost always with no safety training provided. All this increases the risk of accidents in this sector.



Source: Pixabay <https://pixabay.com>

Health hazard for farmers in particular includes:

- **Exposure to farm chemicals, such as pesticides and fertilizers, as well as toxic gases which may be produced from common farm practices**
- **Falls from ladders, grain bins, falls from farm equipment, or other heights**
- **Exposure to ultraviolet rays from the sun, which can effect skin cancer**
- **Exposure to high levels of dust, which can contain mold, bacteria, and animal droppings**

- **Joint and ligament injuries, which can result in arthritic conditions affecting mobility**
- **Exposure to loud noises and sounds from machinery and equipment which can result in hearing loss**
- **Risk of heatstroke, frostbite, or hypothermia from working outside in extreme weather conditions**
- **Risk of injury from operating farm equipment and motorized vehicles**
- **Risk of injury from working with livestock**
- **Risk of electrocution to persons operating large equipment that can contact overhead power lines**
- **Stress from environmental factors, such as droughts, floods, wildfires, pests, and diseases affecting crops and livestock, as well as from working long hours, financial concerns, and feelings of isolation and frustration**



Source: Pixabay <https://pixabay.com>

There are several kinds of workers in agricultural sector exposed to work hazard: **Young workers** are very often lack experience. They are tend to be impulsive. Young workers need a training and supervision until they become competent enough.

Elderly workers are more vulnerable to some conditions, like weather. They may have also some limitations because of their age or they may suffer from some chronic illnesses. Elderly workers strength, eyesight, hearing, reflexes, speed of movement, productive capacity may be diminished. Elderly workers need to be given work that is suitable for them. Very often they should be provided with special supervision and be given frequent health surveillance.

Family members might be also required to help, especially when their competence for each agricultural task as they may be untrained so exposed to risk.

Child labour in general should be prohibited. However sometimes children - farm family members can accompany their parents carrying out tasks. In such situations the hazards and risks involved must be also taken into consider. Risk has to be explained to children and should be appropriate and controlled so that no very young person or child is exposed to risks. In any case, they are at risk. Common causes of children accidents on a farm are:

- falls from vehicles;
- falls from height;
- being struck by moving vehicles or objects;
- drowning and asphyxiation;
- contact with machinery;
- driving vehicles;
- poisoning;
- fire;
- contact with animals.

Farm works forbidden for children:

1. steering of agricultural tractors and other self-propelled machinery.
2. staying on the platforms of potato planters and seeders.
3. operating machines for the preparation of fodder - choppers, shotblasting machines, kneading machines, mixers, shredders.
4. sawing (processing) of wood with a circular saw and carrying out auxiliary activities: feeding and receiving of material, sawdust removal.

5. loading and unloading of wood, felling of trees, removal of suspended trees.
6. all work with chemical plant protection agents.
7. work with organic solvents.
8. loading and unloading animals, work on slaughtering and cutting up animals.
9. emptying of liquid waste tanks, removal of slurry, slurry and septic tank contents.
10. excavation, trench and trench work; construction and demolition work.
11. work in closed tanks and containers, in grain silos.

Any work at a height of more than 3 metres on: platforms, ladders, trees, roofs, etc. Work over 1 metre above the ground/floor is hazardous work and must be secured for the child.

12. work involving a lot of noise, inadequate lighting and in rooms with dust from plants or a risk of harmful biological agents (mites, animal parasites, fungi).
13. work involving the lifting and carrying of heavy objects.

Also **immigrant workers** often need to be taken into additional consider.

Communication difficulties between seasonal workers may arise from the use of different languages and they may lead to misunderstandings and even to accidents or, disease.

In this case critical safety and health information have to be translated into the proper language of workers.

Irregular situation has to be also taken in consideration. No contract or work permit, working more hours than the legal limit, not having the legal amount of rest hours and days – these are only some examples of difficulties so be solved by employer.

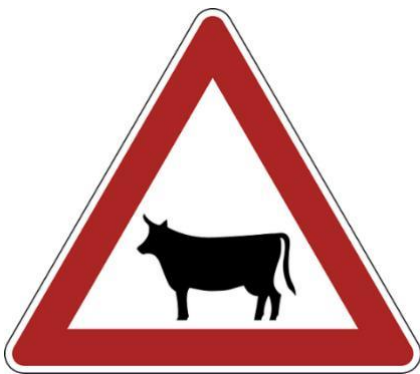
There are also some cultural differences among immigrant workers like even diet or drinking habits as they may be strong in some cultures.

Also religion might be an important point for workers so it is always good to give some allowances for religious requirements.

Signs on the farm is very important and they can help to reduce accidents.

They are used to:

- prohibit an activity;
- impose an obligation;
- warn of danger;
- provide information.



Source: Pixbay <https://pixabay.com>

It is important to familiarize farmers with the meaning of the each signs so they know it and they can distinguish signs by shape and colour:

- prohibition signs are round and red;
- warning signs are triangular and yellow;
- evacuation signs are rectangular and green;
- obligatory signs are round and blue;



Source: Protecting health and safety of workers in agriculture, livestock farming, horticulture and forestry; European Union, 2012.

Work-Related Accident

People working in the agriculture sector are - among the groups - at the high risk of fatal occupational injuries. Injuries in agriculture are mostly related to the machinery and misuse of transport.

These are **the most common serious accidents on the farm and injuries resulting from these accidents:**

- **Death from tipping over during use or serious injury from tipping over.**
- **Fall of farm structures (barns, sheds, agricultural equipment). Many farmers are seriously injured by the fall of grain containers, ladders, haystacks, agricultural equipment or other farm buildings.**
- **Farm workers may be trapped in a grain container or silo, in enclosed spaces which do not have adequate oxygen levels or are contaminated with silo gas or manure and farmers may suffocate.**
- **Farm workers can be seriously injured and disfigured when they are caught by drills or articulated shafts.**

In particular farmers can be injured from operating machinery. This can be associated with movement or mechanical actions such a:

- revolving shafts, wheels or discs;
- in-running nips points;
- revolving drums, spiked cylinders or beaters;
- revolving augers, worms or spirals in casings;
- reciprocating, oscillating or sliding motions.



Source: Pixabay <https://pixabay.com>

The main efforts to prevent accidents in agriculture are engineering improvements as well as use of personal protective equipment. Very important is also alcohol intake prevention and regular appropriate education of the people working in this sector. Very important is also to provide special prevention trainings and programs that should take age differences and gender into account.

To prevent accident and to limit the impact of accidents an appropriate first-aid kit should be kept on site and be readily available to provide an immediate assistance if its needed.

3. Occupational Illness

Agriculture in every industrialized country is one of the most hazardous occupations. Diseases caused by agriculture are different in different parts of the world. Occupational illnesses in agriculture are conditioned by a range of factors. Some of factors that can be mentioned are climate, fauna, living conditions, population density, eating habits, level of education, occupational training, standards of hygiene, working conditions, quality of and access to services, technological development and more.

Low back pain and osteoarthritis of the hip or knee are the most often occupational illness in agriculture. Farm workers are endangered to a variety of physical hazards through jobs on the farm. Physical circumstances of agricultural jobs leave farmers potentially vulnerable to osteoarthritis of the hip and knee or low back pain. This kind of jobs can also cause upper limb disorders or hand-arm vibration syndrome. "Heavy occupations" may also provide to the consequences of trauma such as sprains, dislocations or fractures. There is also an evidence to suggest that farm workers may be more susceptible to other rheumatic illnesses for example rheumatoid arthritis. Respiratory illnesses are common problems among the agricultural workers as well. The most frequent cause of respiratory problems among farmers is organic dust. Dust could be from livestock production and handling grain or hay that may produce bronchitis, asthma. The most common category of skin condition is contact dermatitis. This may occur as irritant or allergic contact dermatitis. Sunburn and heat exposure are the second most common causes of skin conditions among the farmers.



Source: Pixabay <https://pixabay.com>

The issue of pesticide exposure is often a dominant concern among the farming population and also noise induced hearing loss, vibration-related injuries.

There are many hazardous substances on farms that can cause occupational illnesses.

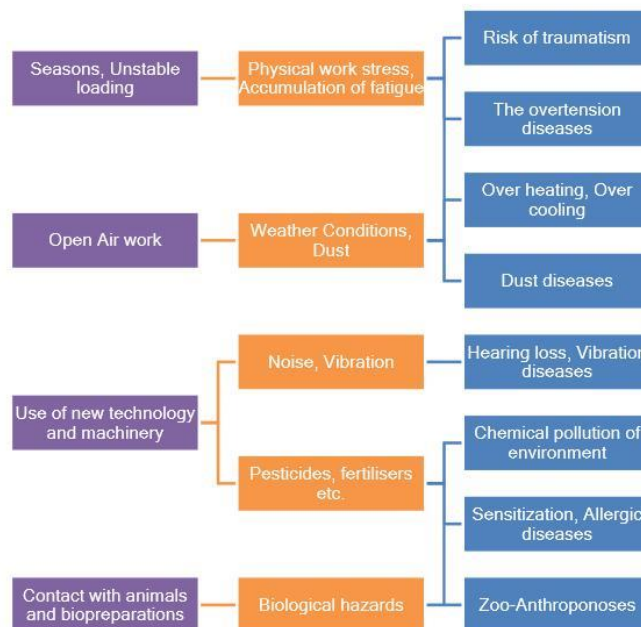
Some examples of hazardous substances are:

- Chemicals
- Pesticides and fumigants
- Solvent veterinary medicines
- veterinary medicines
- Manure, slurry, mould
- Paints/timber preservatives
- Asbestos
- Cleaning agents/disinfectants
- Fertilisers
- Fuels and oils
- Wood dust

Above hazardous substances may cause:

- Poisoning
- Cancer
- Chronic diseases
- Gastric disorders
- Parkinson's disease
- Teratogenesis
- Death

Occupational Health Problems in Agriculture



Source: <https://slideplayer.com/slide/6271563/>

4. Basic legal framework related to occupational health & safety

Legal framework related to occupational health and safety in agriculture is a very broad issue. As in practice, there are various legislative approaches to the protection of labour and safety standards in the agriculture, the legislation includes not only laws and regulations concerning only agricultural work, but all general orders and directives at global level as well as at the local, state level. Occupational safety and health management in agriculture involves not only Ministries of Labour and Health but also Ministries of Agriculture and the

Environment and these institutions are mostly responsible for labour relations, employment, training in agricultural sector, health and safety in agriculture, working conditions and also technical aspects of agricultural production.

Below is an overview of just a few of the legal regulations on occupational safety in agriculture. The following provisions have been included to show how broad the scope of the law is in agriculture and how many legal acts are related to this sector.

Protection of workplace health is regulated in **Framework Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work**. It is described as a "Framework Directive" for occupational safety and health by the European Agency for Safety and Health at Work. The directive authorizes the Council of the European Union to adopt individual directives in areas listed in its annex.

The *European Framework Directive on Safety and Health at Work* lays down general principles about prevention and protection of workers against occupational accidents and against diseases. In December 2017, the European Union adopted the *Directive (2017/159)* implementing in the same time the Agreement concerning the implementation of the Work in Fishing Convention 2007.

Several legal acts regulating the work of emigrants in agriculture have been issued. Some of them are: **the Migration for Employment Convention, 1949 (No. 97); Migrant Workers Convention, 1975 (No. 143); Migrant Workers Equality of Treatment Convention, 1962 (No. 118); International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (1990)**. These workers lawfully in the country of employment should be treated in equality, so they should be covered by social security coverage. Migrant workers should have protection with respect to the fundamental principles and rights at work.

Social security systems include health care, sickness, old age, maternity and invalidity benefits as well as workers' compensation. Social protection systems are particularly very important for workers engaged in agriculture, forestry or fisheries activities. Several legal acts have been issued at European level on the subject: **the Social Security Convention, 1952 (No. 102); Medical Care and Sickness Benefits Convention, 1969 (No. 130); Invalidity, Old-Age and Survivors' Benefits Convention, 1967 (No. 128); The Workmen's Compensation Agriculture Convention, 1921 (No. 12); Social Insurance Agriculture Recommendation, 1921 (No. 17);**

Employment Injury Benefits Convention, 1964 (No. 121); ICESCR, Section 9; The Maternity Protection Convention, 2000 (No. 183), and its Recommendation No. 191; CEDAW (1979).

Agriculture is one of the most dangerous sectors to work in and regulatory frameworks on labour in agriculture incorporate standards on safety and health. Regulatory frameworks prescribe preventive and protective measures regarding machinery safety, equipment, ergonomics, handling and transport of materials, sound management, etc. Below are some of the legal acts regulating this issue: **the Vocational Rehabilitation and Employment**

Convention, 1983 (No. 159); Human Resources Development Convention, 1975 (No. 142); United Nations Convention on the Rights of Persons with Disabilities, 2006; The Safety and Health in Agriculture Convention, 2001 (No. 184).

The current European Union initiative - the Occupational Safety and Health - **Strategic Framework on Health and Safety at Work 2014-2020** identifies some main challenges to improve implementation of existing health and safety papers and rules. In particular the EU proposes to do it by enhancing the capacity of enterprises (small and medium) and to put in place effective and efficient risk prevention strategies. These strategies will help to improve the prevention of work-related diseases in agriculture by tackling new and emerging risks.

Non-fatal accidents at work, by economic activity, EU-28, 2011-2017

NACE (Section)	(thousands)							(incidence rate)						
	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017
Total (all activities)	3 414.7	3 165.4	3 180.5	3 276.6	3 267.1	3 339.9	3 344.5	1 665.1	1 575.9	1 537.6	1 580.9	1 535.1	1 570.8	1 557.9
Agriculture, forestry and fishing (A)	164.9	150.9	157.9	177.5	170.2	168.8	155.5	1 359.8	1 694.3	1 645.6	1 890.6	1 864.5	1 917.5	2 098.8
Mining and quarrying (B)	14.4	12.5	12.0	10.6	9.7	9.4	9.8	1 933.2	1 697.4	1 739.1	1 609.4	1 256.9	1 455.5	1 401.5
Manufacturing (C)	723.8	673.7	648.7	627.1	625.4	633.4	624.7	2 223.5	2 089.9	2 005.4	1 946.8	1 867.1	1 922.4	1 837.3
Construction (F)	479.9	418.4	378.0	376.6	372.3	371.7	376.4	3 381.5	3 066.8	2 869.3	2 920.4	2 843.4	2 879.2	2 875.8
Wholesale and retail trade (G)	451.2	416.8	426.0	410.8	412.6	416.0	412.5	1 494.8	1 373.1	1 419.3	1 378.0	1 393.0	1 382.6	1 380.4
Transportation and storage (H)	286.2	268.7	284.7	271.0	274.5	270.8	300.7	2 764.5	2 590.3	2 668.7	2 539.4	2 470.9	2 430.5	2 633.1
Accommodation and food service activities (I)	168.0	159.6	161.7	157.1	163.4	170.4	170.6	1 816.4	1 698.6	1 730.7	1 623.1	1 645.4	1 665.6	1 600.0
Administrative and support service activities (N)	279.9	246.2	245.3	239.7	244.9	262.8	288.9	2 388.7	2 158.8	2 335.3	2 160.7	2 270.8	2 176.9	2 364.6
Public administration and defence (O)	128.5	123.9	169.6	235.6	229.9	224.1	199.0	1 034.7	1 062.1	1 250.7	1 638.6	1 583.9	1 543.5	1 325.3
Human health and social work activities (Q)	319.5	305.6	321.9	369.4	370.3	378.8	376.4	1 570.0	1 472.7	1 417.4	1 629.3	1 539.9	1 616.7	1 569.1

Note: non-fatal accidents reported in the framework of ESAW are accidents that imply at least four full calendar days of absence from work (serious accidents).
Source: Eurostat (online data code: hsw_n2_01)

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9. Pictures used in the module are from Online Free Database: Pixabay: <https://pixabay.com>
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Additional resources

1. <https://www.labour.gov.on.ca/english/hs/faqs/hazards.php#what1>
2. <https://www.bpglegal.com/articles/common-types-farm-injuries/>
3. https://www.krus.gov.pl/fileadmin/moje_dokumenty/obrazki/broszury/KRUS-informator.2016-wers.ang.pdf

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6. <http://www.fao.org/3/CA0018EN/ca0018en.pdf>
7. <https://www.ilo.org/public/english/standards/relm/ilc/ilc88/rep-vi-1.htm>
8. <https://www.sciencedirect.com/science/article/abs/pii/S2468584417300661#undfig1>
9. <https://nasdonline.org/1246/d001050/health-hazards-in-agriculture-an-emerging-issue.html>
10. <https://www.ruralmutual.com/resource/farm-safety/children-on-the-farm/top-3-causes-of-agriculture-related-injuries-or-deaths-and-how-to-prevent-them/>
11. https://cloud6n.edupage.org/cloud/Plakat_wykaz_prac_zabronionych.pdf?z%3A5wy6x%2Bw%2FjBqzfWni8sxHTvJHVM9UQvbc3CEZe%2FACfCok6Rs3K9UAXB0cghWztDm