

Safety in the agricultural activities

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**A state of complete
physical, mental and social
wellbeing, and not merely
the absence of disease**

World Health Organization's definition of health

Agriculture

- Agricultural and forestry activities carried out in agricultural undertakings including crop production, forestry activities, animal husbandry and insect raising
- Primary processing of agricultural and animal products by or on behalf of the operator of the undertaking as well as the use and maintenance of machinery, equipment, appliances, tools, and agricultural installations, including any process, storage, operation or transportation in an agricultural undertaking, which are directly related to agricultural production
- Subsistence farming
- Industrial processes that use agricultural products as raw material and the related services
- Industrial exploitation of forests.

Objectives

- Raise awareness of the hazards and risks associated with agriculture and how they can be effectively managed and controlled and accidents and diseases prevented
- Prevent occupational accidents and diseases and improve the working environment in practice in individual agricultural enterprises
- Encourage governments, employers, workers and other stakeholders to cooperate in their efforts to prevent accidents and diseases to workers in agriculture;
- Raise awareness of OSH issues concerning particular groups of workers, such as women, young workers and migrant workers;
- Promote more positive attitudes and behavior towards OSH in agriculture throughout the sector
- Ensure that good workplace health and safety practices are applied to all workers in the workplace regardless of age or gender

The characteristics of OSH in agriculture

Employment and OSH

- With more than a third of the world's labour force employed, agriculture is the second greatest source of employment worldwide after services.
- It is the most important sector for female employment in many countries, especially in Africa and Asia, and a worldwide the major proportion of agricultural workers are women
- Agriculture involves a wide range of different types of machinery, animals, plants and products, working in both indoor and outdoor environments under widely varying geographic and climatic conditions
- Agricultural enterprises in many developed countries are highly mechanized and operate on a large scale while in many developing countries labour-intensive farming is much more common

Employment and OSH

- High involvement of migrant workers and many workers employed on a casual, piecework or seasonal basis
- Such wide-ranging profiles, both in terms of employment and of enterprise, have a significant bearing on levels of risk awareness and on attitudes towards preventing accidents and diseases within the sector
- Agriculture is one of the most hazardous of all sectors and many agricultural workers suffer occupational accidents and ill health each year

Employment and OSH

- The causes of accidents and ill health are many:
 - working with machines, vehicles, tools and animals;
 - exposure to excessive noise and vibration;
 - slips, trips and falls from heights;
 - lifting heavy weights and other work giving rise to musculoskeletal disorders;
 - exposure to dust and other organic substances, chemicals, and infectious agents;
 - other working conditions common to rural environments, such as exposure to extreme temperatures, inclement weather and attacks by wild animals

Employment and OSH

- Child labour is also more prevalent in agriculture than in any other economic sector, accounting for approximately 70 per cent of child labour worldwide
- Since many children below the age of employment live on farms, the risk of accidents and diseases to them is significantly increased, including through exposure to pesticides and other chemicals frequently used in agriculture
- International efforts to eliminate child labour in agriculture have continued for many years, but children below and above the legal age of employment continue to suffer accidents on farms, some of them fatal



Addressing the challenges

- Improving OSH in agriculture faces a number of difficulties:
 - a. Many agricultural workers are only poorly protected by national labour law, and some countries specifically exclude the agricultural sector from their general labour legislation and/or from OSH legislation
 - b. In other countries some relevant legislation does exist but it is poorly applied in practice and inadequately enforced by labour inspectors. In particular, labour inspectorates are often inadequately resourced and trained and inspectors rarely if ever visit rural enterprises such as farms unless transport is provided
 - c. National systems for improving OSH in agriculture and competent OSH advice is often scarce

Addressing the challenges

- d. Many farmers and workers are unaware of their obligations, rights and responsibilities and fail to comply with such OSH legislation that does exist. This is made worse in that agriculture is one of the sectors where trade unions, for many reasons (including legal restrictions, geographical isolation and cultural attitudes), face the greatest challenges to organize the workforce
- e. The prevalence of seasonal, migratory and casual labour along with the added constraints of illiteracy, ignorance of workers' rights, and isolation render the task of organizing among rural workers particularly difficult

Addressing the challenges

- The challenges for improving OSH in agriculture need to be addressed on several fronts:
 - a. The competent authorities should establish national policy and develop OSH legislation
 - b. consideration should be given to developing national OSH programmes for agriculture
 - c. The labour inspectorates need to address issues of resources for inspection and of information and training in the context of OSH inspection in agriculture
 - d. Particular attention should be given to specific risks and risk groups, bearing in mind that a major proportion of agricultural workers are women. Seasonal and casual workers also need to be given specific attention

Developing a national
framework
for OSH in agriculture

OSH Policy and programmes

- Promote the development of national policies, systems and programmes for OSH covering all economic sectors, including agriculture whose aim should be to promote a preventive OSH culture and to promote the effective management of OSH both at a national and at enterprise level
- With specific regard to agriculture, governments should adopt comprehensive OSH legislation that affords protection for all workers in the sector, irrespective of their gender and employment status, in accordance with the Safety and Health in Agriculture Convention, 2001
- Labour inspectors should also have sufficient legal status and powers, as well as resources and training, to be able to enforce the legislation adequately in the sector

OSH Policy and programmes

- National systems for OSH should include organizations and mechanisms aimed at promoting OSH in agriculture :
 - a. authorities or bodies responsible for OSH and for ensuring compliance with national laws and regulations, including systems of inspection
 - b. information about hazards and risks in agriculture and how these may be addressed, and related advisory services
 - c. OSH training for employers and workers
 - d. occupational health services to be available in rural areas as well as urban ones

OSH Policy and programmes

- e. mechanisms for the collection and analysis of data on occupational injuries and diseases
- f. collaboration with relevant insurance or social security schemes covering occupational injuries and diseases
- g. support mechanisms for a progressive improvement of OSH in very small agricultural enterprises, such as subsistence farms, and in the informal economy

OSH Policy and programmes

- National programmes covering agriculture should, in particular:
 - a. promote the development of a national preventive OSH culture for the sector
 - b. contribute to the protection of workers by eliminating or minimizing, so far as is reasonably practicable, work-related hazards and risks, in accordance with national law and practice, in order to prevent occupational injuries, diseases and deaths and to promote OSH in the workplace
 - c. include objectives, targets and indicators of progress
 - d. be supported, where possible, by other complementary national programmes and plans which will assist in achieving progressively a safe and healthy working environment

Competent authority

- Ensure that relevant legislation protects agricultural workers as effectively as workers in other sectors
- Ensure that all agricultural workers, irrespective of their employment status, have the same level of OSH protection and are subject to the same requirements for prevention
- Provide guidance to employers' and workers' organizations on ensuring equal protection for vulnerable workers, such as temporary, casual and migrant workers, women and young workers, contractors and workers provided by labour supply agents (especially women and young workers in these groups)
- Promote a management systems approach to OSH
- Promote the establishment of OSH policies and OSH committees and the appointment of OSH representatives at the enterprise level

Competent authority

- Issue statutory provisions that should include: regulations, approved codes of practice, exposure limits and procedures for consultation and dissemination of information
- Establish systems and criteria for classifying substances used and produced in agriculture that may be hazardous to health, in accordance with national and international standards
- Establish requirements for marking and labelling substances provided for use in agriculture, taking into account the need to harmonize such systems internationally
- Establish criteria for determining information provided in chemical safety data sheets



Competent authority

- Establish systems and criteria for identifying safety and health hazards and appropriate risk control measures relating to machinery, equipment, processes and operations used in agricultural production
- Establish safety standards with regard to the design, manufacture and use of tractors and other machinery used in agriculture, based on scientific criteria and accepted international practice
- Adopt systems of market surveillance to ensure that substances, machinery and equipment that are supplied or imported for use in agriculture meet appropriate national requirements



Competent authority

- Where there are serious hazards that may pose unacceptable OSH risks to workers, the competent authority should consult with the representative organizations of employers', workers concerned and with other relevant parties and should have systems in place to:
 - a. prohibit or restrict the use of certain hazardous processes or substances in agriculture
 - b. require advance notification and authorization before such processes and substances are used
 - c. ensure that the risks faced by certain categories of workers with regard to specified processes or substances are thoroughly assessed to determine whether or under what conditions such workers may be allowed to use such processes or substances



Competent authority

- Establish, review and apply systems for the reporting, recording, notification and investigation of occupational accidents, diseases and dangerous occurrences in agriculture. These are essential for both reactive and proactive monitoring and should be undertaken to:
 - a. provide reliable information about occupational accidents and diseases at workplace and national level
 - b. identify major safety and health problems arising from agricultural activities
 - c. define priorities of action
 - d. develop effective methods for dealing with occupational accidents and diseases
 - e. monitor the effectiveness of measures taken to improve OSH performance



Labour inspectorates

- It is vital that labour inspectorates have adequate resources so that inspectors can routinely visit agricultural enterprises and that they are adequately trained and instructed about OSH in agriculture
- Labour inspectors should be adequately trained so that:
 - a. they are competent to deal with technical and legal issues associated with OSH in agriculture and can provide relevant support and advice to all parties involved
 - b. they are able to secure the enforcement of relevant OSH and minimum age legislation

Labour inspectorates

- Labour inspectors should secure the enforcement of relevant OSH legislation at agricultural workplaces in accordance with national legislation, in a gender-sensitive manner and in particular:
 - a. carry out preventive inspection visits to agricultural enterprises frequently
 - b. investigate selected accidents, diseases and complaints, to determine causation and to promote prevention, bearing in mind their obligation to respect confidentiality regarding the source of complaints
 - c. supply technical information and advice to employers, workers and their representatives with respect to their OSH-related responsibilities, duties and rights



Labour inspectorates

- d. notify the employer, the workers concerned and their representatives and OSH committees of the findings of inspections, for the implementation of required remedial action
- e. take enforcement measures, including imposing orders to take immediate action to remove danger or to remedy non-compliance, or to recommend such action to the competent authority



Labour inspectorates

- While the principal task of labour inspectors is to secure the enforcement of relevant national legislation, inspectors also have a vital role in national OSH programmes and should:
 - a. collaborate with the competent authority also regarding small and micro-enterprises, family farms and enterprises in the informal economy
 - b. propose innovative means of reaching out to such enterprises and also vulnerable workers, such as through agricultural fairs and exhibitions, the media, the trade press, training and educational activities and other means
 - c. work with a wide range of partner organizations, such as agricultural training providers, educational and research institutes, safety and health advisory services and manufacturers and suppliers of machinery and substances



Employers

- Have a duty to provide and maintain safe and healthy workplaces, plant, tools and other working equipment. They should also organize work so as to prevent, so far as is reasonably practicable, occupational accidents and diseases, and apply relevant standards, codes and guidelines as prescribed, approved or recognized by the competent authorities
- Should give high priority to the management of OSH in agriculture, which should also be integrated into other management systems
- Should set out OSH policies, which should be specific to their enterprises and appropriate to their size and the nature of activities

Employers

- Should have particular regard for the OSH of more vulnerable workers in agriculture, including casual and seasonal workers, migrant workers, lone workers and women and young workers, and take appropriate action to ensure their protection from occupational accidents and diseases
- Have to grant that OSH measures do not involve any expenditure for the workers
- Should provide OSH measures to all workers without discrimination

Employers

OSH policy

- OSH policies should include the following key principles and objectives to which employers are committed:
 - a. promoting a preventive OSH culture within the enterprises, including positive attitudes and behaviour regarding OSH issues
 - b. recognizing the biological differences between women and men and managing OSH in such a way that the OSH of all employees is protected and occupational accidents and diseases are prevented
 - c. complying with relevant OSH national laws and regulations, voluntary programmes, collective agreements on OSH and other requirements to which the enterprise subscribes or may wish to subscribe



Employers

OSH policy

- d. identifying personnel, including senior managers and directors, to carry out specific responsibilities in the area of OSH in agriculture
- e. ensuring that workers and their representatives are consulted and encouraged to participate actively in all elements of the OSH management system
- f. regular monitoring and review of OSH arrangements
- g. continuous improvement of the performance of the OSH management system
- h. providing continuous information and appropriate training of all workers and their representatives and ensuring that workers receive and understand the relevant safety and health information provided



Employers

OSH policy

- i. recognizing OSH to be an important function within enterprise management structures and integral to business performance and productivity
- j. provisioning of the necessary resources to ensure a safe and healthy working environment in agriculture
- k. providing arrangements for communication with other relevant bodies, for example legislators, workers' organizations, public utilities such as water authorities, and organizations responsible for environmental conservation and health care
- l. promoting the constitution of the OSH committee with the inclusion of women workers on such committees
- m. providing procedures for the enforcement of OSH requirements



Employers

OSH policy

- n. providing procedures for the recording and notification to relevant national authorities of occupational accidents, diseases and dangerous occurrences
- o. providing the means by which the policy will be communicated to all workers including the date on which the policy will be reviewed and, as necessary, revised
- p. organizing any emergency procedures



Employers

OSH organization and arrangements

- Employers should:
 - a. set out in writing their OSH policy, programmes and other arrangements needed to implement the OSH policy
 - b. define the various OSH responsibilities, accountability and authority levels of directors, managers, supervisors and others and communicate these to their workers, visitors or any other persons in the workplace, as appropriate
 - c. ensure consultation with the workers and their representatives in the fulfilment of the OSH policy
 - d. define the OSH competence requirements for all employees and establish training arrangements to ensure that all managers, supervisors, workers and workers' safety representatives are competent to perform their safety and health duties



Employers

OSH organization and arrangements

- e. ensure that workers have sufficient information, in a form and language that they understand, concerning OSH risks and arrangements for managing them, including emergency arrangements
- f. establish and maintain appropriate documentation and communication arrangements
- g. identify hazards and assess risks, reducing them in accordance with the specific principles
- h. act on information supplied to them by their employees or other workers regarding any unsafe, unhealthy or illegal working practice
- i. organize first aid and emergency prevention, preparedness and response arrangements



Employers

OSH organization and arrangements

- j. establish procedures for the compliance with OSH requirements
- k. ensure compliance with OSH requirements by contractors and subcontractors working at the agricultural enterprise
- l. develop, establish and review procedures to monitor, measure and record OSH performance, taking into consideration the results of the investigations of occupational accidents, diseases and dangerous occurrences, OSH compliance audits and reviews of the OSH system by management
- m. identify and implement preventive and corrective actions and opportunities for continual improvement



Employers

OSH committees

- Employers should provide for the establishment and efficient functioning of OSH committees, recognizing workers' elected OSH representatives. OSH committees should include workers or their representatives and employers' representatives with the knowledge, experience and skill in matters of OSH.
- Participation of women on these committees should be encouraged.
- OSH committees should meet regularly or if a specific need arises and participate in the decision-making process related to OSH-related issues.



Employers

Young workers

- Employers should be fully informed of the increased risks to OSH faced by young workers in agriculture. They should ensure that young workers are trained in safe work procedures and demonstrate their ability to perform tasks safely before being assigned to do so. Young workers should be closely supervised and any unsafe work practices immediately corrected. Employers should ensure that children below the age of legal employment are not employed in agriculture, whether or not accompanied by a parent.



Workers

- Workers should participate in instruction and training programmes provided by the employer or required by the competent authority, and should behave in a manner consistent with their training.
- Workers and their representatives should review the instruction and training programmes and make recommendations as necessary.
- Training schedules should accommodate workers with family responsibilities. Where workers identify failures in training delivery or content, they should inform their employer and make recommendations to remedy those failures

Workers

- Workers should have the duty, in accordance with their training, and the instructions and means given by their employers, to:
 - a. comply with prescribed OSH measures
 - b. take all steps to eliminate or control hazards or risks to themselves and to others arising during agricultural production, including through the proper care and use of protective clothing, suitable for both women and men workers, facilities and equipment placed at their disposal for this purpose
 - c. cooperate with the employer and other workers to permit compliance with the duties and responsibilities placed on the employer and workers

Workers

- Should have the duty to cooperate with the employer to achieve compliance with the duties and responsibilities placed on the employer
- Have the right to be informed and consulted on OSH matters including risks from new technologies and to participate in the application and review of OSH measures and, in accordance with national law and practice, to select OSH representatives and representatives in OSH committees
- Have the right to inquire into and receive information from the employer regarding any hazards or risks to safety and health arising from agricultural production, including information from suppliers. This information should be provided in forms and languages easily understood by the workers



Workers

- Should report forthwith to their immediate supervisor or safety and health representative any unusual conditions at the workplace or affecting installations and equipment which they believe could present a hazard or risk to their safety or health or that of other people, and which they cannot deal with effectively themselves
- Should participate and cooperate in exposure monitoring and health surveillance programmes required by the competent authority and/or provided by the employer for the protection of their health
- Have to notify the competent authority if they consider that the measures taken and the means used by the employer are inadequate for the purpose of ensuring a safe and healthy working environment



Workers

- Workers should be informed in a timely, objective and comprehensible manner:
 - a. of the reasons for the examinations and investigations relating to the safety and health hazards involved in their work
 - b. of the results of medical examinations, including pre-assignment medical examinations, and of the respective health assessments. The results of medical examinations should be communicated individually to the worker concerned, and kept confidential in accordance with national legislation and should not be used to discriminate against workers



Workers

- In the case of a safety or health condition that places them at increased risk of harm, they could request a transfer to alternative work not exposing them to that increased risk, if such work is available and if the workers concerned have the qualifications or can reasonably be trained for it
- Have to be provided with adequate medical treatment and compensation for occupational injuries and diseases resulting from agricultural production
- Women workers should have the right, in the case of pregnancy or when breastfeeding, to alternative work not hazardous to the health of the unborn or nursing child, where such work is available, in order to prevent exposure to hazards, and to return to their previous jobs at the appropriate time without a loss of earnings



Other parties

- Other parties involved in OHS system management will not be discussed in depth and are:
 - Manufacturers
 - Suppliers
 - Contractors and sub-contractors
 - Labour supply agents



OSH policies and procedures

Checklist	Step 1			Step 2	Step 3
	N.A.	Yes	No	Priority for action	Action required
Safety and health policy statement					
1. Does the workplace have a written, posted and signed occupational safety and health (OSH) policy?					
2. Have all workers been made aware of the OSH policy at their workplace?					
Safety and health responsibilities					
1. Does the workplace-specific OSH policy establish the responsibilities of the employer/manager?					
2. Does the workplace-specific OSH policy establish the responsibilities of the supervisor(s)?					
3. Does the workplace-specific OSH policy establish the responsibilities of the worker?					
4. Does the workplace-specific OSH policy establish the responsibilities of visitors?					
5. Does the workplace-specific OSH policy establish the responsibilities of contractors and others?					
Posted safety and health materials					
1. Are the forms for reporting injury at work conspicuously posted and/or available at the workplace?					
2. Is a copy of the relevant safety and health legislation conspicuously posted and/or available at the workplace?					



OSH policies and procedures

Checklist (cont'd)	Step 1			Step 2	Step 3
3. Are emergency service numbers conspicuously posted and/or available at the workplace?					
4. Are explanatory materials about safety and health legislation, such as a user's guide, posted at the workplace?					
Safety and health standards and procedures	N.A.	Yes	No	Priority for action	Action required
1. Does the workplace have communicated standards and procedures for reporting workplace injuries and illnesses?					
2. Does the workplace have communicated standards and procedures for reporting hazards?					
3. Does the workplace have a communicated emergency evacuation plan?					
4. Does the workplace have communicated personal protective equipment (PPE) standards and procedures adequate for women and men?					
5. Does the workplace have communicated procedures for processing "work refusals"?					
Safety and health representative/committee	N.A.	Yes	No	Priority for action	Action required
1. Does the workplace have safety representatives?					
2. Does the workplace have an OSH committee? If yes, are there women workers on this committee?					
3. Does the workplace have communicated procedures with regard to the responsibilities and activities of the OSH representative/committee?					



OSH policies and procedures

Checklist (cont'd)

	Step 1			Step 2	Step 3
4. Does the workplace have safety representatives' names and work locations posted in a conspicuous workplace location?					
5. Are the minutes of the OSH committee posted?					
Safety and health education/training	N.A.	Yes	No	Priority for action	Action required
1. Does the workplace have policies, standards and procedures for OSH training?					
2. Does the workplace have new employee orientation training and initial job instruction, which includes observation and supervision, to ensure workers are competent in the assigned activities?					
Workplace safety and health and inspections	N.A.	Yes	No	Priority for action	Action required
1. Does the workplace have a communicated policy and procedures, ensuring regular workplace inspections?					
2. Does the workplace have a communicated policy and procedure for addressing issues highlighted by inspections?					
Workplace injury and incident investigations	N.A.	Yes	No	Priority for action	Action required
1. Does the workplace have policy and procedures for reviewing incidents resulting in lost time injuries?					
2. Does the workplace have policy and procedures for reviewing incidents resulting in fire or environmental release?					
3. Does the workplace have a communicated procedure for reporting critical injuries?					



Occupational safety and health management systems

OSH management systems

- The positive impact of introducing OSH management systems at the enterprise level, on the recognition and elimination of hazards, the prevention and reduction of risks and the enhancement of productivity, is now recognized internationally by governments, employers and workers. In particular, it helps to promote positive attitudes towards OSH and also a preventive OSH culture, both at the enterprise level and more widely

OSH management systems

- Typically, an OSH management system should contain the following main elements:
 - a. OSH policy
 - b. OSH organization and arrangements for establishing responsibility and accountability, competence requirements and training, documentation and record keeping, communication and information, etc.
 - c. hazard identification and risk assessment
 - d. planning and implementation of controls
 - e. monitoring, evaluation and improvement of OSH performance

Hazard identification

Risk assessment

- The employer should identify, evaluate systematically and record the hazards and risks to workers' safety and health that may arise during the course of their work taking into account such factors as sex, age, disability and reproductive health
- A risk assessment involves a careful examination of the working environment to identify hazards (physical, chemical, biological, ergonomic, organizational) and to evaluate the potential harm that they could do

Hazard identification

Risk assessment

- The identification of hazards in the workplace should take into account:
 - a. the situation or events or combination of circumstances that have the potential to give rise to injury or illness
 - b. the nature of potential injury or illness relevant to the activity, product or service
 - c. those likely to be harmed (e.g. young workers, older workers, temporary workers, pregnant workers)
 - d. past injuries, incidents and illness

Hazard identification

Risk assessment

- The identification process should also include consideration of:
 - a. the way in which work is organized, managed, carried out and any changes that occur in this
 - b. the design of workplaces, work processes, materials, plant and equipment
 - c. the fabrication, installation and commissioning of plant and equipment and the handling and disposal of materials in the workplaces
 - d. the purchasing of goods and services



Hazard identification

Risk assessment

- e. the contracting of plant, equipment, services and labour including contract specification and responsibilities to and by contractors
- f. the inspection, maintenance, testing, repair and replacement of plant and equipment. Special attention should be paid to risks associated with less frequently performed tasks, such as maintenance and repair, or clearing blockages from machinery



Hazard identification

Risk assessment

- Evaluation of risk takes into consideration both the likelihood of the hazard causing harm to persons and the severity of such harm if it were to occur and involves five steps:
 1. Identification of hazards
 2. Identification of who might be harmed and how
 3. Evaluation of the risks and how to control them
 4. Recording the results of the assessment and setting priorities for improvement
 5. Reviewing and updating the assessment as necessary

Hazard identification

Risk assessment

- There are many established methods and techniques for carrying out risk assessments.
- Some use a numerical weighting system to determine priorities for action.
- For each hazard identified, a numerical value is assigned to the likelihood of the hazard causing harm as well as to the severity of the consequences.
- This can be expressed on a rising scale as follows

Hazard identification

Risk assessment

Likelihood	Grade	Severity of consequences
<u>Rare</u> Has rarely if ever happened	1	<u>Insignificant</u> No injury or ill health
<u>Unlikely</u> Is possible, but is not expected to happen	2	<u>Minor</u> Short-term impact
<u>Moderate</u> Could be expected to happen once a year	3	<u>Moderate</u> Semi-permanent injury or ill health
<u>Likely</u> Will probably occur, but is not persistent	4	<u>Major</u> Disabling injury or ill health
<u>Almost certain</u> Occurs regularly	5	<u>Catastrophic</u> Potentially fatal

Hazard identification

Risk assessment

- The degree of risk can be evaluated by mean of the formula

$$\text{Risk} = \text{Severity} \times \text{Likelihood}$$

and represented with the following risk matrix

		Severity					
		Almost certain	Likely	Moderate	Unlikely	Rare	
Likelihood	5	5	4	3	2	1	
	Catastrophic	5	25	20	15	10	5
Major	4	20	16	12	8	4	
Moderate	3	15	12	9	6	3	
Minor	2	10	8	6	4	2	
Insignificant	1	5	4	3	2	1	

Hazard identification

Risk assessment

- By determining the level of risk associated with each hazard identified in the working environment, employers and workers and their representatives can identify areas for priority action.
- Priority areas of action can be determined by evaluating particular hazards in the workplace against the previous matrix than can be considered as an action table where the red areas represent the highest priorities for action followed in a reverse priority order by the yellow and the green ones.

Hazard identification

Risk assessment

- Anyway, two questions need to be considered for each hazard:
 1. “How often is a person exposed to the hazard?”
 2. “What is the likely outcome?”
- The assessment should be reviewed whenever there has been a significant change in the work to which it relates or when there is reason to suspect that it is no longer valid.
- It may be useful to record the results of the assessment in a narrative form, specifying the activity or workplace being assessed, the main hazards and those at risk, the level of risk and the measures to be put in place to eliminate, reduce or minimize exposure

Hazard identification

Risk assessment

Health and safety risk assessment form

Name of the employer and enterprise

Address

Work activity or workplace being assessed	Identify the main hazards and those at risk of injury or ill health	Assess the likelihood of risk and severity of injury or ill health	Risk reduction measures to be put into place
Tractor use	<ol style="list-style-type: none"> 1. Rollover of tractor especially when on slopes. At risk: the driver, unauthorized riders or those working close by. 2. Being run over by tractors, especially when reversing. At risk: those working close by and bystanders such as children who live on farms. 3. High noise levels from the tractor engine. At risk: the driver. 4. High whole-body vibration levels from the tractor chassis. At risk: the driver. 	<ol style="list-style-type: none"> 1. Risk of death or serious injury can be high in certain places. 2. Risk of being run over is high in areas of poor vision and close to domestic buildings. 3. Risk of noise-induced hearing loss is high over prolonged periods of exposure. 4. Risk of back pain and other musculoskeletal disorders is high over prolonged periods of exposure. 	<ol style="list-style-type: none"> 1. The tractors should be equipped with a rollover protection structure (ROPS) and seat belt. All tractor operators should be trained in the safe use of tractors and particularly rollover prevention and required to follow safe work practices. The "one seat-one rider" rule should be enforced without exception. 2. All tractor operators should be alert to the presence of co-workers and bystanders and ensure that they are kept at a safe distance. Horns and flashing lights should be fitted, especially for larger tractors. If fitted, they should be used. 3. Sound-proofed safety cabs should be fitted, which may also serve as a ROPS. 4. Driver seating should be ergonomically designed.



Planning and implementation of controls

- Based on the results of the risk assessment and other available data (e.g. the results of workers' health surveillance, surveillance of the working environment, active and reactive monitoring), the employer should:
 - a. define OSH objectives for the reduction of such risks to as low a level as possible
 - b. devise and implement corresponding preventive measures, based on an appropriate order of prevention
 - c. develop, approve and implement a “safe work plan” before any operation starts
- These activities should include the routine application of site inspection and planning as well as of the principles of work organization



Planning and implementation of controls

- Preventive and protective measures should be implemented in the following order of priority:
 1. eliminate or substitute the hazardous agent with a less hazardous one, (e.g. less or non-hazardous chemicals)
 2. reduce the hazard/risk at source using engineering controls (e.g. providing sound-proofed safety cabs for tractors)
 3. minimize the hazard/risk by using safe working procedures or other organizational measures (e.g. restrict entry into places that have been sprayed with pesticides)
 4. where unacceptable risks remain, provide suitable personal protective equipment (PPE) (e.g. respiratory protective equipment, hearing protectors) ensuring it is both properly used and maintained

Planning and implementation of controls

- PPE should be used whenever hazards and risks cannot be controlled by collective measures, but should not be considered a substitute for higher level controls
- Control measures should be monitored and reviewed at regular intervals and if necessary revised, especially when circumstances change or if new information becomes available about the risks posed or the suitability of existing control measures. Control measures should also be reviewed and if necessary revised following an accident

Personal protective equipment

- Personal protective equipment (PPE) provides supplementary protection against exposure to hazardous conditions in agricultural production where the safety of workers cannot be ensured by other means, such as eliminating the hazard, controlling the risk at source or minimizing the risk.
- Suitable and sufficient PPE, having regard to the type of work and risks, and in consultation with workers and their representatives, should be used by the worker and provided and maintained by the employer, without cost to the workers. The same level of protection should also be provided for casual or seasonal workers
- PPE is the last line of defence and the least effective. It should be used whenever hazards and risks cannot be controlled by collective measures, but should never be considered as an adequate substitute for higher level control measures

Personal protective equipment

- Those responsible for the management and operation of the personal protection programme should be trained
 - a. in the nature of the hazards against which the PPE is intended to provide protection
 - b. in the selection, storage, testing and replacement of suitable PPE
 - c. in assuring that it is correctly fitted to the people who use it, and that a range of equipment is available in order to provide adequate comfort
 - d. in the consequences of poor performance or equipment failure
 - e. to have an understanding of the appropriate action to take



Personal protective equipment

- PPE should be selected considering the characteristics of the wearer and additional physiological load or other harmful effects caused by the PPE. It should be used, maintained, stored and replaced in accordance with the standards or guidance for each hazard identified at the workplace and according to the information given by the manufacturer. PPE stocks should be managed to ensure that appropriate PPE is always available
- PPE should be examined periodically in accordance with the manufacturer's recommendations, taking into account the amount of use to ensure that it is in good condition
- Different PPE and their components should be compatible with each other when they are worn together



Personal protective equipment

- PPE should be personal to the wearer, unless it is properly cleaned after each use
- PPE should be assessed for ergonomic design and, to the extent practicable, should not restrict the user's mobility or field of vision, hearing or other sensory functions
- Employers should ensure that the workers who are required to wear PPE are fully informed of the requirements and of the reasons for them, and are given adequate training in the selection, wearing, maintenance and storage PPE itself
- Workers must use the equipment provided throughout the time they may be exposed to the risk that requires the use of PPE for protection
- PPE must not contain hazardous substances (e.g. asbestos)



Personal protective equipment

Helmets and other head protection

- Helmets should be worn by workers exposed to the risk of head injury. Helmets should be selected with regard to the task to be performed
- In addition to safety, consideration should also be given to the physiological aspects of comfort for the wearer. The helmet should be as light as possible, the harness should be flexible and should not irritate or injure the wearer and a sweatband should be incorporated
- Helmets should be periodically checked for deterioration and replaced as appropriate

Personal protective equipment

Face and eye protection

- Face shields or eye protectors should be used to protect against flying particles, fumes, dust and chemical hazards
- Face and eye protectors should give adequate protection at all times even with the use of corrective vision devices

Personal protective equipment

Upper and lower limb protection

- Protective gloves should be selected with regard to the task to be performed and worn, as appropriate, to protect hands against physical, chemical and other hazards
- Safety footwear, shin guards, and other leg protection should be used where appropriate

Personal protective equipment

Respiratory protective equipment (RPE)

- When effective engineering controls are not feasible, or while they are being implemented or evaluated, respirators, appropriate to the hazard and risk in question, should be used to protect the health of the worker
- When the degree of risk so indicates, the employer should make positive pressure air-supplied respiratory protective devices available
- When selecting respirators, an appropriate number of sizes and models should be available from which a satisfactory respirator can be selected. Different sizes and models should be available to accommodate a broad range of facial types and to offer workers choice with regard to comfort. Workers should be fit-tested for respirators

Personal protective equipment

Hearing protection

- When effective engineering controls, such as noise damping, are not feasible or while they are being implemented or evaluated, hearing protection should be used to protect the hearing of workers.
- Commercially produced protective muffs or earplugs are the principal types of hearing protectors. They should be manufactured to specification in order to provide adequate protection.
- Special attention should be paid to the possible increased risk of accidents due to the use of hearing protectors. Unless designed to overcome this problem, earmuffs reduce the capacity to locate sound sources and prevent warning signals from being heard. This is especially true for workers with considerable hearing loss

Personal protective equipment

Protection from falls from height

- Workplaces, such as mobile elevated work platforms, in which there are risks of falling from height, should normally be equipped with suitable guard rails or edge protection. Where such measures do not eliminate the risk of falling, workers should be provided with and trained in the use of appropriate fall arrest equipment, such as safety harnesses and lifelines
- Safety harnesses should be chosen that can be safely used with other PPE, so that both may be worn simultaneously
- Harnesses should be worn where required and lifelines should be attached to adequate anchor points
- Appropriate and timely rescue should be provided when using fall-arrest equipment to prevent suspension trauma

Machinery safety

- Agriculture involves the use of a wide variety of hazardous machinery and processes
- Among the most common are tractors, cultivators, harrows, seeding equipment, sprayers, harvesters, mowers, balers, grinders, trucks, wagons, trailers, all-terrain vehicles, augers, manure spreaders, and elevating equipment
- A wide range of tools are used both in agricultural production and when carrying out repairs
- The safety features of equipment and tools should be key considerations at the time of purchase as well as the adaptability of usage for both women and men workers

Machinery safety

- The principal safety risks include traumatic injuries including, but not limited to, cuts, burns, electrocution, fractures and amputations caused by contact with cutters, gears, belts, shafts and other moving parts, burst hydraulic hoses and contact with live electrical equipment
- Injuries occur not only during the course of production but also during maintenance and repairs, cleaning, clearing blockages, etc. The effects of such injuries can be all the more serious because many farm workers work alone and first aid or medical help may be far away
- The safety standards set by the competent authority with regard to the design, manufacture, installation and use of agricultural machinery and equipment and any necessary market surveillance should be undertaken before such equipment is used



Tractors and ATVs

Hazard description

- Farm tractors are the most important piece of power equipment used in agriculture and are associated with a major proportion of injuries and deaths in agricultural production and maintenance.
- All-terrain vehicles (ATVs) are used as transport vehicles in many countries, in part because they provide the first step away from draught animals in some enterprises, and in part because they can perform many tractor-like operations within close quarters, inside agricultural structures, other enclosures, and in livestock operations
- Older tractors warrant special attention as they are often not fitted with up-to-date safety equipment, such as rollover protective structures (ROPS) and seat belts

Tractors and ATVs

Hazard description

- Hazards associated with tractors and ATVs can be grouped into instability resulting in rollovers, run-overs, power-take-off (PTO) entanglement and other miscellaneous risks including, but not limited to, slips and falls when climbing on or off tractors and ATVs, crushing injuries from unintended rolling, and driving under low-hanging branches
- Tractors that do not have up-to-date health and safety features (e.g. rollover protection structures (ROPS), seat belts, temperature-controlled cabs) require specific risk assessment, and such safety features should be retrofitted where possible
- Noise associated with farm tractors and ATVs use can result in hearing impairment
- Vibration associated with tractors and ATVs use may result in musculoskeletal injuries

Tractors and ATVs

Hazard description

- The employer should establish an inventory of tractors and ATVs used in the enterprise and determine whether they are fitted with up-to-date safety features, including ROPS, PTO shields, seat belts, etc. In assessing risks from such vehicles, the employer should take account of the protection afforded to the driver from existing safety features, the uses to which the vehicles are put, whether they work on slopes, and the skill levels of the drivers themselves. Risks from hydraulic hoses and other power sources should also be considered, as should risks from poor maintenance, such as from worn brakes
- The employer should also bear in mind any risks to co-workers, such as from being run over or from any malpractices like riding on vehicles without proper seating. Risks of injury to pedestrians should also be taken into account



Tractors and ATVs

Elimination of the hazard

- The elimination of hazards relative to the maintenance and operation of tractors in agriculture presents a major challenge
- Total elimination may prove difficult given the number and variety of tractors and ATVs, the wide range of tasks and the level of risk in the outdoor environment
- Nonetheless, the employer should have as a goal the elimination of tractor and ATV hazards by the use of all safety modalities available, including engineering controls, safe work systems and procedures and the training, induction and supervision of workers
- The employer should ensure that adequate competency-based training is provided to tractor and ATV operators and the worker is expected to be fully cooperative and compliant with such training and certification

Tractors and ATVs

Engineering controls

- Tractors and ATVs that workers are asked to operate must be equipped with ROPS, seat belts, PTO shields, mudguards to protect the worker from movement of the wheels and a muffler that successfully results in noise abatement
- Brakes, emergency brakes, lights, signal lights and other safety devices have to be regularly maintained and kept in safe working condition
- Tractors equipped with cabs must have means of controlling the interior temperature to an acceptable standard and the noise in the cab. If noise exposure cannot be reduced to acceptable limits, PPE should be provided to the worker
- Tractors and ATVs must be equipped with seating that is designed to reduce musculoskeletal injuries to the worker

Tractors and ATVs

Safe working systems and procedures

- Employers and tractor operators should be aware that the tractor's centre of gravity is central to its stability:
 - a. adding weights (e.g. lifting fork, front-end loader, side-saddle and rear chemical tanks) alters the centre of gravity
 - b. moving off a flat plane (level surface) alters the centre of gravity
 - c. centrifugal force can contribute to overturn when tractors are turning
 - d. rear-axle torque can cause the front end of a tractor to lift off the ground if the rear axle cannot rotate
 - e. loads should only be attached to tractors in accordance with design specifications

Tractors and ATVs

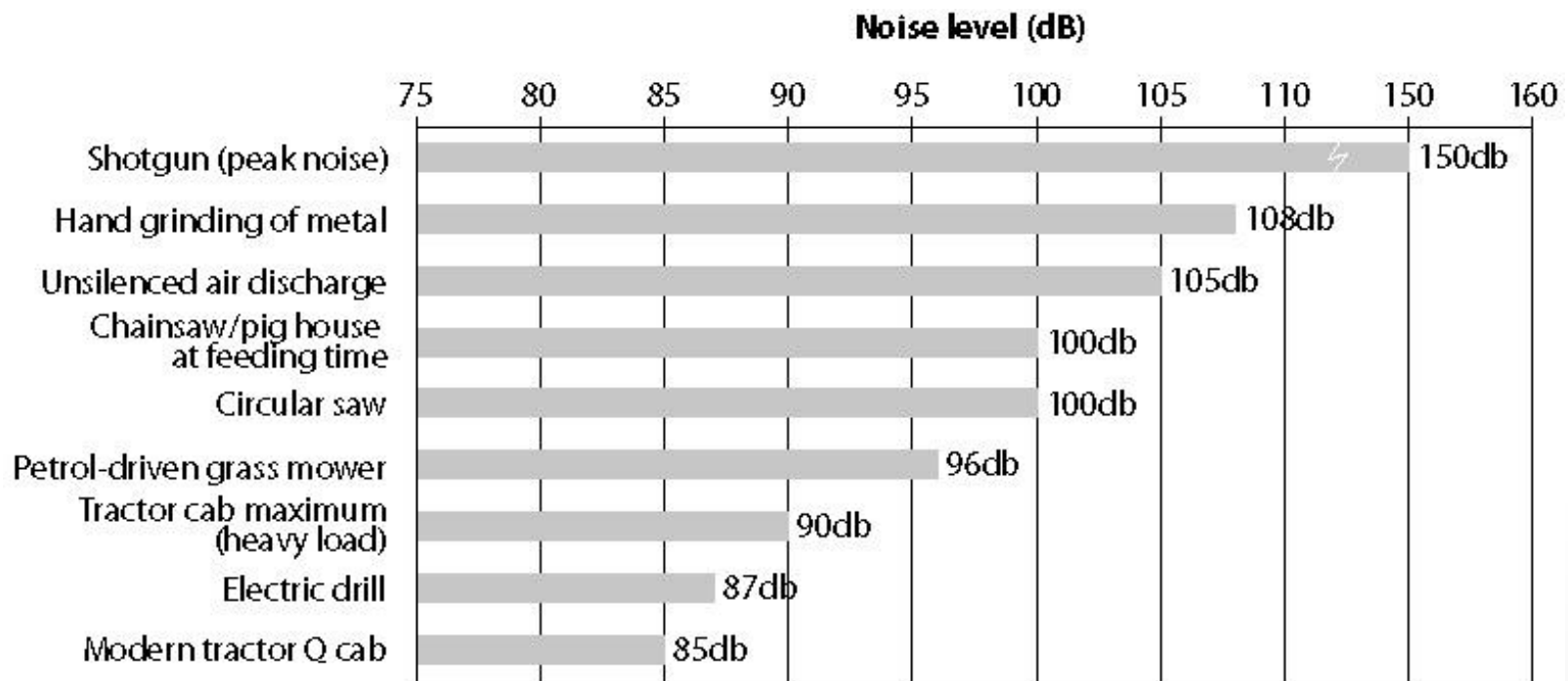
Safe working systems and procedures

- The employer should ensure that workers understand how to prevent PTO injuries
- Wrap-point hazards can be reduced by the use, repair and replacement of master shields on PTOs
- Proper work procedures should be followed to prevent entanglement in PTOs
- To reduce risk of entanglement injuries, loose-fitting clothing, long or untied hair, jewellery and other personal objects should not be worn when working with PTOs and other equipment

Noise

- Noise is a serious occupational hazard to those who work in agriculture. The less exposure to noise the better. Hearing loss may result from a single intense exposure or cumulative exposure to noise
- There are many potential sources of noise on farms, including tractors, chainsaws, grain dryers and guns, and contact with animals such as pigs
- Some typical noise levels are shown in the following table. By comparison, the noise level of a normal conversation is 50–60 dB

Noise



Noise

- For machinery, the best option for reducing noise is to do so at source through good design. For example, many new tractors and other farm equipment have been designed so as to emit low levels of noise. The second option is to reduce noise by installing sound-proofed enclosures, acoustic materials or other engineering measures
- If such means are insufficient, hearing protectors should be provided and the amount of time spent in noisy environments limited. Hearing protectors may also be needed for other agricultural processes, such as working with livestock

Noise

Hazard description

- Hearing damage usually occurs over longer periods of time because of prolonged exposure to high noise levels
- Hearing loss may be only temporary after short periods of exposure to noise. If workers exposure to high noise levels continues they will suffer permanent damage to their hearing
- Permanent damage can also be caused immediately by sudden, extremely loud noises (e.g. from guns)
- High noise levels can also be a safety hazard at work, interfering with communication and making warnings harder to hear, and they can also increase worker fatigue and cause irritability, reducing performance
- Noise is generally measured over an eight hours work exposure time. Work exposures longer than eight hours will reduce the allowed noise levels for extended time frames

Noise

Risk assessment

- Employers should assess the risks to their workers of noise-induced hearing loss, and in particular:
 - a. identify the particular agricultural machinery and processes that give rise to such exposure
 - b. assess the risk of hearing impairment from such equipment and tasks
 - c. assess the degree of interference to communications essential for safety purposes
 - d. assess the risk of fatigue, with due consideration to the mental and physical workload and other non-auditory hazards or effects

Noise

Risk assessment

- Noise measurements should be used to:
 - a. quantify the level and duration of exposure of workers and compare it with exposure limits, as established by the competent authority or internationally recognized standards to be applied
 - b. identify and characterize the sources of noise and the exposed workers
 - c. create a noise map for the determination of risk areas and activities
 - d. assess the need both for engineering noise prevention and control, and for other appropriate measures and their effective implementation
 - e. evaluate the effectiveness of existing noise prevention and control measures

Noise

Exposure limits

- An exposure limit (EL) is a level of exposure specified by a competent authority as an indicator of the level to which workers can be exposed without serious injury. It is used as a general term and covers the various expressions employed in national lists (“threshold limit value”, permissible level”, “limit value”, “average limit value”, “permissible limit”, “occupational exposure limit”, etc.)
- The exact definition and intended application of ELs vary widely from one authority to another, and the underlying definitions and assumptions and the requirements of the appropriate competent authority should be taken into account if they are used
- Some authorities consider ELs as legally permitted “safe” levels of exposure in order to protect against injury, not against every health effect

Noise

Exposure limits

- Noise is conventionally measured as the pressure of the sound wave
- The ear responds roughly to the logarithm of the pressure, rather than its linear value, so noise intensity is measured in decibels (dB), which are related to the logarithm of the ratio of the pressure of the sound to the pressure of a standardized least detectable sound
- The ear is more responsive to some frequencies than others, so measurements and ELs are in terms of dB(A), which takes a frequency weighting into account

Noise

Exposure limits

- All authorities specify an EL in terms of dB(A) applicable to eight-hour exposures, with a formula to deal with other exposure periods, and in most cases a peak EL as well
- Some authorities apply stricter standards to particular environments
- Users should apply standards that are adopted or recognized by the competent authority
- These include a series of ISO standards on acoustics (1999:1990; 4871:1996; 9612:2009; 7196:1995; 11690:1996).

Noise

Engineering controls

- Based on assessments of workers' exposure to noise, employers should establish programmes to reduce such exposure to the lowest levels practicable. Such exposure should not exceed the limits established by national and/or international laws and standards
- In the case of new machinery and equipment, employers should:
 - a. specify low noise emissions as a condition of purchase from their suppliers, so that machinery and equipment conform to relevant national or international laws and standards, such as ISO standards
 - b. arrange the workplace layout and job assignments so as to minimize workers' noise exposure

Noise

Engineering controls

- If workers' noise exposures are still higher than those determined by national laws and standards, employers should reduce such exposures through other engineering means as far as practicable, such as by fitting sound-proofed enclosures or using other acoustic materials
- Employers should maintain machinery and equipment as part of a planned programme of maintenance, since worn components may increase noise levels. Worn out equipment and tools should be removed from use and replaced with new technology

Noise

Safe working systems and procedures & PPE

- If after engineering controls have been implemented, workers' noise exposures remain unacceptably high, as determined by national laws and standards, employers should, in consultation with workers and their representatives:
 - a. minimize the exposures through appropriate organizational measures that reduce the time workers spend in the noisy environment
 - b. provide suitable hearing protectors, such as earplugs or muffs, selecting them in consultation with workers and their representatives
- Where hearing protectors are provided, employers should ensure that they are properly maintained and replaced as often as necessary

Noise

Safe working systems and procedures & PPE

- Where hearing protectors need to be worn, hearing protection zones should be designated where the use of hearing protectors is mandatory and the need to wear hearing protectors should be indicated with appropriate signs. Hearing protectors should be available at the entries to the protection zones



Noise

Health surveillance, training and information

- Where workers' noise exposures are likely to exceed those permitted by national laws and standards, they should receive regular audiometric testing
- Employers should ensure that such workers are trained in:
 - a. the effective use of hearing protectors
 - b. identifying and reporting new or unusual sources of noise that come to their attention
 - c. the role of regular audiometric testing
- If regular audiometric testing produces significantly abnormal results, the causes should be determined and appropriate action taken
- A record of audiometric testing should be kept for a period in accordance with national laws and regulations



Noise

Health surveillance, training and information

- Employers should ensure that workers are informed of:
 - a. the results of their audiometric tests
 - b. the factors leading to noise-induced hearing loss and the consequences for the worker, including non-auditory effects and social consequences, especially for young workers
 - c. the precautions necessary, especially those requiring workers'
 - d. the effects that a noisy environment may have on their general safety and health
 - e. the symptoms of adverse effects of exposure to high levels of noise



Vibration

- Vibration in the workplace is generally classified as:
 - a. whole body vibration, which is transmitted by sitting or standing on vibrating surfaces, such as when driving tractors and other farm machinery. Prolonged exposure can lead to severe back pain and other musculoskeletal disorders
 - b. hand–arm vibration, which is transmitted through the use of hand-held powered equipment like chainsaws, brush cutters and hedge trimmers. Prolonged exposure can lead to damage to the hand and arm muscles (hand–arm vibration syndrome), joints and nerves

Vibration

- Short duration exposure to whole body vibration or to hand–arm vibration may result in temporary disability, but prolonged or repeated exposure leads to permanent damage.
- The main concerns are therefore the magnitude of vibration transmitted and the duration of exposure
- Exposure to whole body vibration is unlikely on its own to cause injuries, but it can aggravate existing back injuries which may cause pain

Vibration

- As with noise, vibration is best reduced or eliminated at source through good design of equipment. (e.g. tractors with in-built suspended cabs or chainsaws with anti-vibration mountings can reduce vibration emission levels significantly)
- Engineering controls to reduce vibration subsequently may be possible but these are usually less effective
- PPE, such as anti-vibration gloves, is not a substitute for engineering controls and should only be considered as a last resort
- However, exposure levels will be reduced by spending less time working with vibrating equipment

Vibration

Hazard description

- Common sources of whole body vibration include driving or standing on a tractor, all-terrain vehicles or other machinery to perform tasks like baling, drilling, foraging, spraying, ploughing and harrowing
- The effects of whole body vibration are made worse by driving over rough ground or over bumps or potholes
- It is also experienced when standing on vibrating platforms, such as mechanical harvesters and motorized tree fruit picking platforms, or working near large machinery, such as milling or threshing machines

Vibration

Hazard description

- Common sources of hand–arm vibration in agriculture are the use of hand-held vibratory tools and equipment, such as chainsaws, brush cutters or grinders
- Other sources include impact wrenches used in equipment maintenance and repair, chainsaws, brush saws and weed saws, portable fruit or olive harvesters and vibro-compactors

Vibration

Risk assessment

- Employers should assess the risks to their workers from both whole body vibration and hand–arm vibration, and in particular:
 - a. identify the sources of vibration and the tasks that give rise to exposure, considering the types of equipment being used, the conditions under which they are used and the duration of exposure
 - b. assess the risks of musculoskeletal and other injuries from such tasks and processes
 - c. assess the risk of fatigue, with due consideration to the mental and physical workload and other non-auditory hazards or effects

Vibration

Risk assessment

- Vibration measurements should be used to:
 - a. quantify the level and duration of exposure of workers and compare these with exposure limits, as established by national and/or international law and standards
 - b. identify and characterize the sources of vibration and the exposed workers
 - c. assess the need both for engineering prevention and control and for other appropriate measures and their effective implementation
 - d. evaluate the effectiveness of existing prevention and control measures

Vibration

Exposure limits

- An exposure limit (EL) is a level of exposure specified by a competent authority as an indicator of the level to which workers can be exposed without serious injury. It is used as a general term and covers the various expressions employed in national lists (“threshold limit value”, permissible level”, “limit value”, “average limit value”, “permissible limit”, “occupational exposure limit”, etc.)
- The exact definition and intended application of ELs vary widely from one authority to another, and the underlying definitions and assumptions and the requirements of the appropriate competent authority should be taken into account if they are used
- Some authorities consider ELs as legally permitted “safe” levels of exposure in order to protect against injury, not against every health effect



Vibration

Exposure limits

- ELs for vibration are usually in terms of the root-mean-square (rms) acceleration, frequency weighted to take human response into account
- The standard is usually applied to eight-hour exposures, with a formula to account for shorter or longer periods
- For whole body vibration, limits are applied to the longitudinal component (through the head and feet), to the two axes at right angles to this, and to a weighted combination of all three (ISO 2631-1:1997)
- For hand-transmitted vibration, limits are applied to frequency-weighted acceleration along three orthogonal axes centred at the point of contact of the hand and the tool (ISO 5349-1:2001 provide guidance on measurement and evaluation)

Vibration

Engineering controls

- Based on assessments of workers' exposure to vibration, employers should establish programmes to reduce such exposure to the lowest levels practicable. Such exposure should not exceed the limits established by national and/or international laws and standards
- In the case of new machinery and equipment, employers should specify low vibration emissions as a condition of purchase from their suppliers, so that the machinery and equipment conform to relevant national or international laws and standards, such as ISO standards

Vibration

Engineering controls

- If workers' exposures to vibration are still higher than those determined by national laws and standards, employers should reduce such exposures through vibration damping as far as practicable, such as by fitting anti-vibration mounts or replacing unsuspended tractor cabs with suspended ones
- Employers should maintain machinery and equipment regularly, since worn components may increase vibration levels. Worn out equipment and tools should be removed from use and replaced with new technology

Vibration

Safe working systems and procedures & PPE

- Where workers' exposures remain unacceptably high, as determined by national laws and standards, employers should:
 - a. minimize exposures through appropriate organizational measures that reduce the time that workers spend with vibrating machinery
 - b. if appropriate, provide suitable PPE, such as anti-vibration gloves, selecting them in consultation with workers and their representatives

Vibration

Health surveillance, training and information

- Where workers are exposed to vibration levels likely to exceed those permitted by national law and standards, they should receive appropriate information and training about the risks involved. In particular, they should know how to:
 - a. use machinery and equipment so as to minimize exposure to vibration
 - b. recognize symptoms from over-exposure to sources of vibration
 - c. identify and report new or unusual sources of vibration that come to their attention

