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ACTION / SUBPROGRAM:	Key Action 2 / Strategic Partnerships
PROJECT TITLE:	“OSH+ for the European Agriculture sector - Stimulating growth in rural areas through capacity building for providers (and beneficiaries) of occupational medicine and OSH services”
Intellectual Output :	O5 “Course 2 Training Materials - Occupational Physicians”
Module:	1 - Agriculture and Work – Occupational Medicine perspective

1. Module 1: Agriculture and Work – Occupational Medicine perspective

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1.1. Learning Objectives

The trainee should be able to understand recent trends in agriculture, the weight of this industry within the economy of a country as well as its rich diversity of subsectors, work relationships, and organizational-related issues;

The trainee should recognize agriculture as a challenging field for OHS specialists in terms of hazards, risks, pathologies, and related issues;

The trainee should be able to comprehend the relationship between types of subsectors, types of companies, types of exposures and most feasible workplace health promotion measures and programs;

1.2. Introduction

Approximately one billion people, or over 1/3 of the available work force, are employed in the global agricultural sector. Agriculture in many countries employs the largest percentage of women of any industry. Between 1997 and 2007, the percentage of people employed in agriculture fell by over four percentage points, a trend that is expected to continue.

The number of people employed in agriculture varies widely on a per-country basis, ranging from less than 2% in countries like the US and Canada to over 80% in many African nations. In developed countries, these figures are significantly lower than in previous centuries.

In 2017, for AGROSH+ countries, share of agriculture in total employment was 7.0 in Bulgaria, 12.1% in Greece, 5.0 in Ireland and 22.8% in Romania.

1.3. Glossary (van Dijk Frank, Varekamp Inge, Radon Katja, Parra Manuel, 2014)

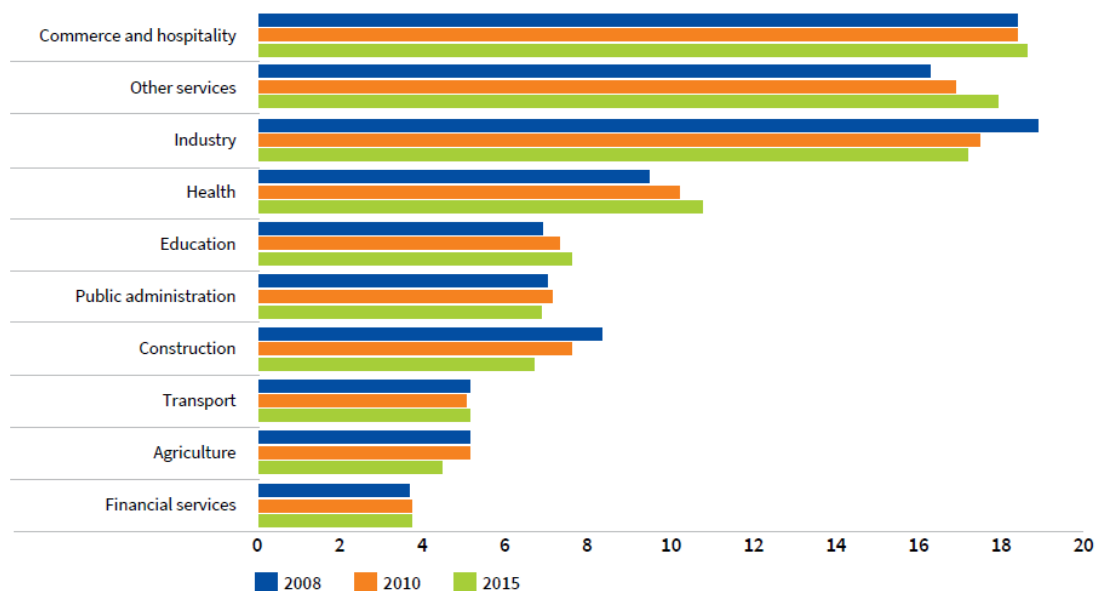
Term	Definition
Occupational health	The development, promotion, and maintenance of workplace policies and programs that ensure the physical, mental, and social well-being of employees. These policies and programs strive to: prevent harmful health effects because of the work environment, protect employees from health hazards while on the job, place employees in work environments that are suitable to their physical and mental capacities and other characteristics,

Term	Definition
	and address other factors that may affect an employee's health and well-being. [IAPA 2007 adapted]
Occupational health professionals	These are persons who have been accredited through appropriate procedures to practice a profession related to occupational health or who provide occupational health services according to the provisions of relevant regulations. They may be occupational health physicians, nurses, occupational safety and health inspectors, occupational hygienists, occupational psychologists and specialists involved in ergonomics, toxicology, accident prevention and the improvement of the working environment, as well as in occupational health and safety research and knowledge transfer. Many others, in addition to occupational health and safety professionals, are involved in the protection and promotion of the health of workers, e.g. management and workers' representatives. [ILO 1998 adapted]
Occupational health surveillance	Occupational health surveillance is the ongoing systematic collection, analysis, interpretation and dissemination of data for the purpose of prevention. Surveillance is essential to the planning, implementation and evaluation of occupational health programs and to the control of work-related ill health and injuries, as well as to the protection and promotion of workers' health. Occupational health surveillance includes workers' health surveillance and working environment surveillance. [ILO 1998]
Occupational health surveillance systems	Occupational health surveillance systems are systems which include a functional capacity for data collection, analysis and dissemination linked to occupational health programs. It refers to all activities at individual, group, enterprise, community, regional and country levels to detect and assess any significant departure from health caused by working conditions, and to monitor workers' general health. Occupational health surveillance programs record instances of occupational exposures or work-related illness, injury or death and monitor trends in their occurrences across different types of economic activities, over time, and between geographical areas. [ILO 1998]
Occupational safety and health	The discipline dealing with the prevention of work-related injuries and diseases as well as the protection and promotion of the health of workers. It aims at the improvement of working conditions and environment. Members of many different professions (e.g. engineers, physicians, hygienists, psychologists, nurses) contribute to "occupational safety, occupational health, occupational hygiene, well-being at work and improvement of the working environment". [ILO 1998 adapted]

1.4. Agriculture, today

Europe 2020 logo ‘The Europe 2020 strategy’, adopted by the European Council on 17 June 2010, is the EU's agenda for growth and jobs for the current decade. It emphasizes smart, sustainable and inclusive growth as a way to overcome the structural weaknesses in Europe's economy, improve its competitiveness and productivity and underpin a sustainable social market economy (EUROPEAN COMMISSION, 2010).

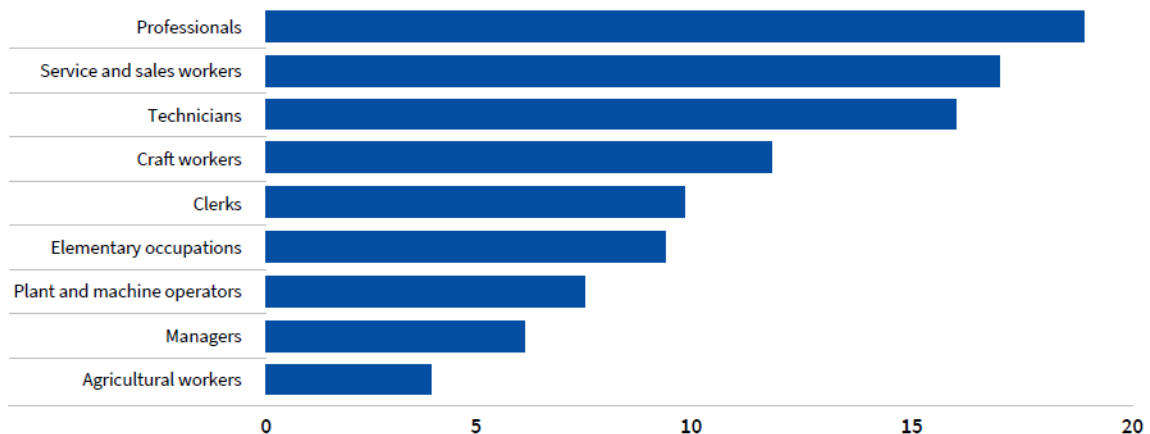
The Common Agricultural Policy (CAP) is the agricultural policy of the EU. Its main objectives are to ensure a decent standard of living for farmers, to provide a stable and safe food supply chain at affordable prices for consumers, and to ensure the development of rural areas throughout the EU (EUROSTAT, 2014). A June 2013 reform of the CAP focused on the sustainable management of resources.



Source: EU-LFS 2008–2015.

Fig.1. Employment by sector, EU28, 2008–2015 (%), (Eurofound, 2016)

The relative weight of agriculture, forestry and fisheries in the EU-28 economy has been in almost perpetual decline over the last 50 years. From 2000 to 2013 the share of agriculture, forestry and fisheries in the EU-28's total economic activity (as measured by gross value added) fell from 2.1 % to 1.7 %.



Source: EU-LFS 2015.

Fig. 2. Employment by occupation in the EU28, 2015 (%) (Eurofound, 2016)

Our days, we return to agriculture. 9.6 billion people are going to inhabit the planet by 2050, as FAO predicts; food production must increase by 70% by 2050; this has to be achieved in spite of: the limited availability of arable lands, the increasing need for fresh water (agriculture consumes 70% of the world's fresh water supply), and other less predictable factors, such as the impact of climate change (Guerrini Federico, 2015).

The history of agriculture records the domestication of plants and animals and the development and dissemination of techniques for raising them productively. Agriculture began independently in different parts of the globe, and included a diverse range of taxa. At least eleven separate regions of the Old and New World were involved as independent centers of origin.

The risk of specific diseases in the agricultural environment has been carefully studied and documented only in the 20th century. The boundary between agricultural and industrial activities is marked, on the one hand, by the nature of the concerns of each field and, on the other hand, by the degree of mechanization of the working operations, from the raw material to the final product, or that agricultural work has components similar to those in industry.

According to WHO 1962 definitions, an agricultural worker means any person temporarily or permanently employed, irrespective of his legal status, in agricultural activities.

The peasant, as a socio-professional category, lives in the rural area, having as main occupation the agriculture, in order to ensure its existence. At present, besides private households practicing traditional farming, there are forms of organization, private or state, which have as their object either the raising of animals or the agricultural crop production. Often these complex activities involve wage labor where the category of workers exists (Bardac, 2007).

It is also a scientific discipline on which the cultivation and management of stands is based. If agriculture has been shown not to adversely affect the health of the workers concerned, except for possible but rare accidents, fish farming and forestry are the first places in terms of work-related accidents; it also generates diseases related to the profession, especially musculoskeletal disorders due to the working conditions in which it develops: unfavorable microclimate, high physical effort.

There are exposed at high risk, especially vulnerable groups: pregnant women, working children, ethnic minorities, migrant workers, people having chronic illnesses, people with disabilities, etc.

Myths about the health of farmers make them the most vigorous, robust and healthy workers. Thus, in 2009, Thelin et al. reported low rates of morbidity and mortality by: cancer, cardiovascular disease, psychiatric disorders and even respiratory diseases for the male rural population, compared to urban witnesses. Higher morbidity data were registered only for musculoskeletal disorders. But the recent reports of the European Agency for Health and Safety at Work place agriculture among the top three most dangerous occupations (alongside construction and health services).

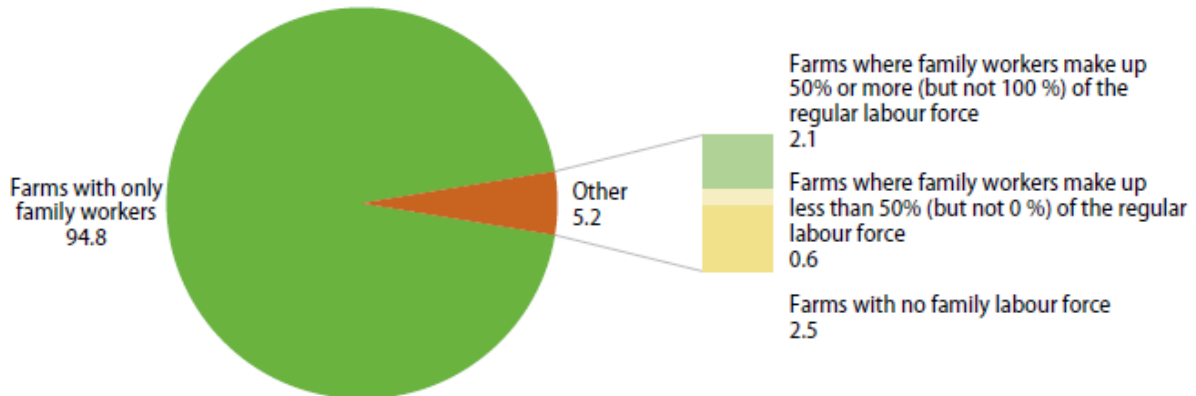
However, there are many examples of countries which, besides occupational health and occupational health institutes, also have specialized institutions on labor in rural areas; so there is in France, at Tours, 1958, the National Institute of Agricultural Medicine; in Finland, 2001-2005, the National Agricultural Health Center; in Poland, in Lublin, established in 1951, the Institute of Rural Health, with a profound research and clinical component; a similar institute in Szczecin; in the United States of America, the Institute of Agricultural Medicine of the State of American Iowa.

Table 1. Health care services for rural residents and agricultural workers

Rural health	Health care services for <u>all rural residents / agricultural workers</u>
Agricultural Health and Safety	Health and safety services that assure the reduction of injuries and illnesses in agriculture population
Agricultural medicine	A discipline which deals with environment and occupational medicine and health, in agriculture
Agro medicine	A process which links medical faculty with extension to provide information, dissemination, and problem solving
Agricultural safety	A discipline of safety professionals who focus on training and apply other methods to reduce acute agricultural injuries

Family farms in EU-28 (EUROSTAT, 2014)

The United Nations' Food and Agriculture Organization (FAO) declared 2014 to be the International year of family farming (FAO, 2014). The FAO defines a family farm as '[...] an agricultural holding which is managed and operated by a household and where farm labor is largely supplied by that household'. Family farms accounted for almost 97 % of the farms in the EU. Across all of the farms in the EU-28, family farms provided 86.2% of the regular agricultural labor force and reared 71.1 % of all livestock in 2010. Their relative share of the total utilized agricultural area was lower, as they accounted for 67.4 % of the EU-28's farmed area.



Source: Eurostat (Farm Structure Survey, 2010)

Fig.3. Share of total number of holdings according to the extent of the family labor force, EU-28, 2010 (% of farm holdings)

Of the 11.9 million family farms in the EU-28 in 2010, almost one third (32.3 %) were located in Romania, while Italy (13.4 %) and Poland (12.6 %) were the only other EU Member States to record double-digit shares of the EU-28 total.

Farms with only family workers represent 94.8%. Usual, they are not covered by occupational health services because they are not employees. Family physician assure medical assistance.

Family farms were also relatively small in Romania, Cyprus, Bulgaria, Hungary, Croatia, Greece, Slovenia, Italy, Portugal and Poland, as each holding cultivated an average area of less than 10 hectares. The smallest farms with only family workers were located in Malta, Romania, Cyprus and Bulgaria. By contrast, the largest farms with only family workers were located in the United Kingdom and Luxembourg.

Greece recorded the largest agricultural area among the EU Member States, with an average of almost 2600 hectares for each farm without any family labor force in 2010, while the next highest area was recorded in Ireland (1 335 hectares per holding).

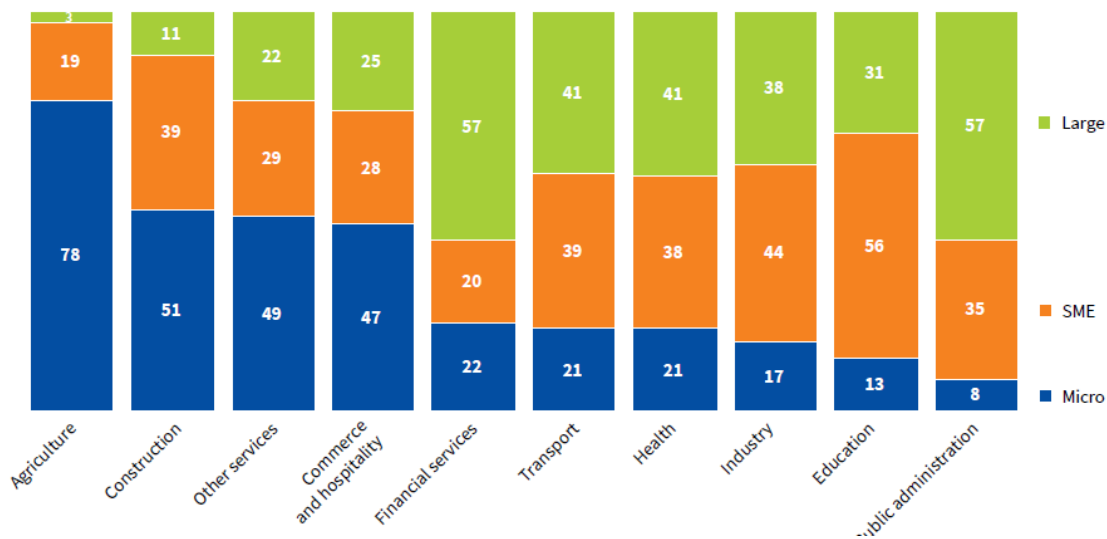


Fig.4. Distribution of workers across economic sectors, by company size, EU28 (%) (Eurofound, 2016)

Family farms in the EU-28 cultivated some 118 million hectares of utilized agricultural area in 2010. The largest areas under cultivation by family farms were located in France and Spain (almost 16 million hectares each) with 13.1 % of the EU-28 total each, while Poland, the United Kingdom and Germany also recorded double-digit shares of the EU-28 total.

Occupational health in agriculture

The common ILO and WHO definition of occupational health, revised in 1995, says that 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 workers in an occupational environment adapted to their physiological and psychological capabilities; and, to summarize, the adaptation of work to the workers and of each worker to his or her job (van Dijk Frank, Varekamp Inge, Radon Katja, Parra Manuel, 2014)

The main focus is on three different objectives:

- to maintain and promote the workers' health and their working capacity;
- to improve working conditions/environment; the purpose is to make work more safety and healthier;
- to develop the work organization and culture in each enterprise for a better support of health and safety at work. Consequences will be a positive social climate, better activity and improved productivity of the enterprises.

Main role and tasks of OHS and the occupational physician can differ in different countries. General accepted tasks are:

- Identification, assessment and control of the risks from health hazards at work;
- Providing training and education;

- Surveillance of workers' health in relation to work;
- Contributing to occupational rehabilitation;
- Organizing first aid.

The concept of working culture is intended in this context to mean a reflection of the essential value systems adopted by each enterprise. In practice, this working culture is reflected in the system of management, personnel policy, participation principles, quality management and training policies of the enterprise (ILO, 1998).

A part of the enterprise policy is health and safety component. In rural areas, especially small and medium enterprises and family farms are not very well covered by OSH services.

Actual problems and perspectives in agriculture are challenging factors for occupational physicians. Their activity is linked at social and economic changes. Most prominent factors are:

- Populations will continue to grow;
- Aging population in rural areas, and chronic diseases;
- Climate changes, global warming;
- Water availability that become more precarious and necessity of irrigation;
- Large-scale monoculture, culture rotation, industrial agriculture;
- Soil erosion, high risk of accidents;
- Agriculture and the Loss of Genetic Diversity;
- Chemical contamination. Pollution of groundwater and surface water (nitrate, pesticides);
- Food security and residues on food (eg. DDT);
- Pesticide resistance
- Genetically modified organisms and market pressure;
- Risk of crop failure and food shortage;
- Sustainability;
- Energy-intensive mechanization, fertilizers and pesticides
- Mitigation of effects of petroleum shortages
- Challenge: to produce 50% more food by 2020.

Professional diseases in the agricultural sector are a direct consequence of exposure to risk factors: physical, physicochemical, chemical, biological and psychosocial, as well as the overworking of organs and systems in the labor process.



Fig. 5. Health problems, by occupation, EU28 (%) (Eurofound, 2016)

This pathology must be correctly diagnosed, and the occupational etiology must be recognized; considering that the control of the risk can decrease or prevent illnesses, occupational medical assistance is very important for prevention. Occupational diseases in agriculture / rural areas are under-reported. They are not recognized like “professional”. As more common occupational diseases in rural workers, we mention:

Musculoskeletal disorders (MSD), as consequence of working day duration, physical effort, manual handling, repetitive movements, different non-ergonomic postures, vibration and temperature. The Sixth European Working Conditions Survey shows that agricultural workers have the highest percentage of backache (55%), upper limb pain (54%) and lower limb pain (45%) (Eurostat, 2016). Synovitis and tenosynovitis, bursitis, epicondylitis, chronic arthritis, peri arthritis: musculoskeletal system overloads, vibration exposure and unfavorable (cold and wet) climate;

Specific for the agricultural environment is the fact that there is an increased prevalence of the occupational risk factors with impact on the respiratory apparatus as below: inorganic powders, especially silicates; very different organic powders, as mites; bacteria - endotoxins; cereal powders; insects; molds - spores; mycotoxins; biological material from rodents or neat animals; micro flora (Micropolyspora faeni, Aspergillums fumigatus in animal breeders).

Specific chronic respiratory diseases by exposure to organic powders such as cereals, animal manure; extrinsic Allergic Alveolitis caused by exposure to moldy mildew, animal manure (bacteria, fungi, actinomycetes); animal and vegetable proteins, low molecular weight chemicals; allergic rhinitis, allergic and irritable asthma caused by exposure to professional allergens and respiratory irritants (grain powders, hay, and straw: fodder plants, lucerne, concentrated fodder: soy, tapioca, lucerne, hair, epidermal patches, feathers, etc.); Silo-Filler's Disease appeared in poorly ventilated silos (shortly after filling with cereals) as a result of the fermentation of immature cereals or pretreated with nitrogen fertilizers (nitrogen oxides are produced);

Conjunctivitis determined by professional allergens and irritants;

The workers in agriculture, with repeated sun exposures, for a long time, can develop the "actinic skin" that become inelastic, dry, wrinkled and brown, keratitis due to UV radiation can appear; face telangiectasia occurs, and on the neck, movements produce lines on the skin in an angular structure. In some situations, squamous or basocellular epitheliomas, as well as keratosis, can develop in tanning people.

Allergic contact dermatitis and dermatitis that can also be determined by trees and plants; urticaria caused by flour, vegetables, fruits;

Insolation, exposure to unfavorable microclimates (cold and wet);

Upper digestive syndrome ("tractor driver epigastric pain"), spinal cord syndrome, renal syndrome (caused by vibrations with a frequency of 2-20 Hz);

Noise induced hearing loss for machinery workers;

Infectious and parasitic diseases; through direct contact with diseased or dead animals or infected material can be transmitted: Bacterial zoonoses (anthrax, brucellosis, leptospirosis); Rickettsiosis (Q fever); zoonosis caused by Chlamydia, Virotic zoonosis (arbovirosis); Mycosis zoonosis (actinomycosis); Parasitic zoonosis (Helminthozoonoses); Arthropod invasions; Organophosphorus pesticide poisoning used to treat crops.

Due to repeated contact with allergens or professional irritants, infectious complications, and pulmonary fibrosis (aged lungs) can occur.

The Economic Impact of Occupational Safety and Health Policy (EASHW)

Countries, and especially enterprises are interested in the economic impact of OSH services. The estimating of the costs and benefits of occupational safety and health, has become an important issue in most Member States of the European Union. The paid attention to it is still increasing.

Some Member States have estimated the cost of work-related illness as a percentage of Gross National Product. Reported percentages range from 2.6 to 3.8 (with a variety of cost factors included). For other Member States estimates were based on the total of the reported cost data as a proportion of GNP. Percentages ranged then from 0.4 to 4.0.

At level of individual enterprise, it is more important to know if specific investment in OSH measures will lower its costs. In most Member States are being developed instruments, which give support to enterprises in evaluating the costs and benefits of measures. Methodology is not uniform, and the results can not be easy compared.

Conclusions

Occupational health is an integral part of the occupational health and safety system, in each EU country.

EU Agriculture continue to be an important and hazardous industry, in which family farms with their specific problems remain in attention.

Main tasks of occupational health services in EU are prophylactic. They must be applied in agriculture, where the medical services register deficiencies (lack of OH specialist physicians and nurses, GPs not very well prepared to solve and recognize occupational health problems, in family farms is not compulsory to assure OH/OM assistance) and the rate of work accidents and work-related diseases are high, but under-reported in agriculture.

Table 3. Link to national legislation and guides related to the diagnostics and compensation of OD in AGROSH+ project countries

Bulgaria	-
Greece	http://www.ika.gr/gr/infopages/stats/stat_report.cfm www.ypak.gr/index.php http://www.sepenet.gr/liferayportal/archike
Ireland	https://www.welfare.ie/en/Pages/oib.aspx
Romania	http://www.itmbucuresti.ro/plegislatie.html http://www.dspb.ro/legislatie/legislatie.php http://www.ms.ro/specialisti-in-domeniul-sanatatii/#tab-id-1

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