Merhaba; Compliments from NL
Occupational Diseases in Agricultural Workers, an overview

GERT VAN DER LAAN, CLAUDIO COLOSIO
ANTALYA MARCH, 2018
Our National OD: Tulip Finger
Frequent contact dermatitis Allergy against tulipine α
(DP Bruijnzeel Bulb dermatitis. Contact Dermatitis. 1997 Aug;37(2):70-7)
Workers:
students
housewifes
migrant workers
The Tulip Finger

Identification by patch testing with chromatography of bulb fluid (Verspijck Mijnssen, 1968)

The tulip allergen:

\[ \alpha\text{-methylene-} \gamma\text{-butyrolactone} \]
Prevention of primine allergy by breeding new variety
Good Agricultural Practices

GAP Core Subjects

- Subjects Related to Farm Administration and Sales Management
- Subjects Related to Food Safety and Quality Improvement
- Subjects Related to Workers Safety
- Subjects Related to Environmental Conservation
Challenges for collection of reliable OSH data. (ILO World Day for Safety and Health at Work 2017)

- Notification and recording of occupational disease and suspected cases of occupational disease is often undermined by the lack of specific knowledge and skills needed for accurate diagnosis and the capacity to carry out periodical medical examinations of workers exposed to hazards.

- Consequently, even when legal frameworks’ coverage is comprehensive, occupational diseases frequently go undetected.

The Healthy Farmer

- Workers in agriculture (farmers and employees) in NL are in better health than other workers (NIVEL/NCOD study): analyses of GP morbidity registration 104 GP’s. 425,000 patients, 2591 farmers
  - Mental (0.6-0.9), Skin (0.4-1.6), Resp.system (0.5-0.9), MSD’s (0.9-1.4); Less prescriptions

- But:
  - Picture is not complete (migrant workers with bad access to health services were not included)
  - In some agriculture work: high risk for occupational diseases (some examples)
Occupational Diseases in Agricultural Workers

- Official figures from compensation system: small numbers

- The Mersin Greenhouse Workers Study

<table>
<thead>
<tr>
<th></th>
<th># cases</th>
<th>% work-related*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td>167</td>
<td>50,1</td>
</tr>
<tr>
<td>Respiratory system</td>
<td>120</td>
<td>50,9</td>
</tr>
<tr>
<td>Musculoskeletal Disorders</td>
<td>268</td>
<td>45,7</td>
</tr>
<tr>
<td>Total</td>
<td>555</td>
<td></td>
</tr>
</tbody>
</table>

* positive on questions concerning temporality, specificity, reversibility

- More detailed case investigation and exposure measurements are planned for targeted prevention actions
The Mersin Greenhouse Workers Study: Work-related Skin, Respiratory, and Musculoskeletal Diseases

Greenhouse work; specific risks

- **Characteristic:** special microcosmos with enclosed conditions: higher exposure to plant materials, plant pests and plant protection products compared with outside horticulture workers.

- **Health effects:** irritancy, asthma, allergic alveolitis and dermatitis + pesticide illness

- + musculoskeletal disorders due to repetitive work in harvesting and packing, pushing and pulling, heavy loads.

- **Wide differences in working conditions:** be very cautious to extrapolate data from one country, crop or time to another

Occupational Diseases in Agricultural Workers

- Taxonomy of Occupational/ work-related Diseases, hybrid character with overlap:
  - Classification based on exposures:
    - Noise, vibration
    - Chemical agents
    - Biological agents
    - Radiation
    - Heat/cold
    - Stress
  - Classification based on target organs:
    - Respiratory system
    - Skin
    - Neurological system
    - Musculoskeletal system
    - Mental system
## Occupational Diseases in Agricultural Workers; some examples

<table>
<thead>
<tr>
<th>Occupational Disease</th>
<th>Causal factor</th>
<th>Occupation at risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise-induced hearing loss</td>
<td>Noise: mechanisation, animals</td>
<td>Tractor drivers, pig breeders</td>
</tr>
<tr>
<td>Farmers lung, (extrinsic allergic alveolitis)</td>
<td>Organic dust: moldy straw, corn, grain</td>
<td>Animal farming with handling hay, compost</td>
</tr>
<tr>
<td>Mushroomworkers Lung</td>
<td>spores</td>
<td>Mushroom growers, harvesters</td>
</tr>
<tr>
<td>Allergic Contact Dermatitis</td>
<td>Animal/plant allergens, fertilizers, pesticides</td>
<td>Most agricultural activities</td>
</tr>
<tr>
<td>Green Tobacco Sickness</td>
<td>Nicotine intoxication</td>
<td>Tobacco harvesters</td>
</tr>
<tr>
<td>Q-fever</td>
<td>Coxiella Burnetti</td>
<td>Goat farmers, veterinarians</td>
</tr>
<tr>
<td>Toxic Encephalopathy</td>
<td>H2S, pesticides</td>
<td>Manure treatment, pesticide application</td>
</tr>
<tr>
<td>Repetitive strain injury</td>
<td>Repetitive, high-intensity activities in awkward position</td>
<td>Harvesting, milking, packaging</td>
</tr>
</tbody>
</table>
Agricultural Skin Diseases

- **Contact dermatitis**
  - Irritant and allergic contact dermatitis (Botanical Dermatology)
  - Photoirritant and photoallergic contact dermatitis

- **Infectious dermatitis**
  - Orf, milkers nodule, dermatophytic fungi

- **Anthropod-induced dermatitis**
  - Bees, wasps, mites, spiders, scorpions

- **Sun-induced skin conditions**
  - Sun burn, actinin keratoses, skin cancer

- **Skin disorders related to heat, cold and humidity**
Fyto-fototoxic reactions
After contact with Umbelliferae
Scars after burns in 32/75 workers
(especially left hand; Bult 1994)
Zoonotic hazards in different agricultural settings

- **Zoonotic hazards in pig meat production:**
  - thermophilic Campylobacter spp., Salmonella enterica, Listeria monocytogenes, Staphylococcus aureus, Methicillin Resistant Staphylococcus Aureus (MRSA), Hepatitis E Virus (HEV) infection, Streptococcus suis, Salmonella spp., Yersinia enterocolitica, Campylobacter spp.

- **Zoonotic hazards in dairy farming and beef production:**
  - Anthrax, Brucellosis, Salmonellosis, Tuberculosis, Cowpox, pseudo cowpox, Q-fever, Trychophyton verrucosa

- **Zoonotic hazards in poultry**
  - Salmonellosis, Influenza A, Psittacosis

- **Zoonotic hazards in sheep and goat farming**
  - Anthrax, Brucellosis, Tularemia, Orf, Q-fever

- **Zoonotic hazards in Rural Environment**

- **Zoonotic hazards in fishing**
# Respiratory Health Hazards in Agriculture

This Official Conference Report of the American Thoracic Society was Approved by the ATS Board of Directors February 1998. This project was cosponsored by the National Institute for Occupational Safety and Health.

## Agricultural Respiratory Disease Common Exposures and Effects

<table>
<thead>
<tr>
<th>Respiratory Region</th>
<th>Principal Exposures</th>
<th>Diseases/Syndromes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nose and nasopharynx</td>
<td>Vegetable dusts, Aeroallergens, Mites, Endotoxins, Ammonia</td>
<td>Allergic and nonallergic rhinitis, Organic dust toxic syndrome (ODTS)</td>
</tr>
<tr>
<td>Conducting airways</td>
<td>Vegetable dusts, Endotoxins, Mites, Insect antigens, Aeroallergens, Ammonia</td>
<td>Bronchitis, Asthma, Asthma-like syndrome, ODTS</td>
</tr>
<tr>
<td>Terminal bronchioles and alveoli</td>
<td>Vegetable dusts, Endotoxins, Mycotoxins, Bacteria and fungi, Hydrogen sulfide, Oxides of nitrogen</td>
<td>ODTS, Pulmonary edema/adult respiratory distress syndrome, Bronchiolitis obliterans, Hypersensitivity pneumonitis, Interstitial fibrosis</td>
</tr>
</tbody>
</table>
Spectrum of respiratory disease in swine confinement workers

Figure 1. The spectrum of respiratory disease in swine confinement workers. Adapted from Von Essen and Donham (69).
Green Tobacco Sickness (GTS)

- **Mechanism:** nicotine poisoning in harvesting/handling tobacco leaves with intensive dermal contact; nicotine contained in the tobacco leaves mixes with rain, dew, or sweat.

- **Symptoms:** nausea and vomiting; dizziness, headaches and cramps.

- Risk of poisoning is higher in warm conditions; dehydration and **heat illness** can complicate the clinical picture and can be fatal.

- **Prevention:** instruction: gloves, long sleeve shirts, long pants and water-resistant clothing.

**Occupational Diseases in Cultivating Marijuana?**

**Risks:**
- delta-9-tetrahydrocannabinol (THC) exposure (skin contact)
- spore levels above 50,000 spores/m³ with one sample over 500,000 spores/m³ (inhalation)
- cutting of tops: repetitive strain injury
Occupational Diseases in Cultivating Marijuana?
Advances in harvesting olives??
Safe work with pesticides

- Authorisation of Plant Protecting Products
  - National and EU-level (specific circumstances in different areas)
  - Prescription of formulation (fluid, granule, powder)
- Education and training
  - Certificate of competence; licence to use
- Technology
  - Automatization of spraying in greenhouses
- Protection
  - Personal protection, re-entry times
- Control
  - Strict inspections, enforcement,
  - Residue control (market correction)
Agricultural Medicine Books

Agricultural Medicine
Rural Occupational and Environmental Health, Safety, and Prevention
SECOND EDITION
KELLEY J. DONHAM AND ANDERS THELIN

James E. Lessenger Editor
Agricultural Medicine
A Practical Guide

WILEY Blackwell
Springer
Agricultural Medicine: books free download

Farmwise
Your essential guide to health and safety in agriculture

Date of publication: 2013
ISBN: 978 0 7176 8579 2
Series code: HSG270 (Second edition)
Price: £10.00

Download a free copy
Buy this product

Related products
The health and safety toolbox
Working safely with agricultural machinery
Using tractors safely

There are persistently high rates of fatal incidents and work-related ill health in
Assessment of occupational disease: 6-step approach

- Consideration of evidence of disease:
  - medical and neuropsychological assessment

- Consideration of toxicological and epidemiological data

- Consideration of evidence of exposure
  - Occupational history and biological monitoring

- Consideration of other relevant factors
  - Differential diagnostic issues

- Evaluation and conclusion (validity of testimony)

- Preventive actions
Acknowledgement:
Frank van Dijk
Take the right track!
Thanks for your attention

g.vanderlaan@occmed.eu
http://www.icohweb.org/site/members-how-to-apply-for-membership.asp

**Individual members**

<table>
<thead>
<tr>
<th>Category</th>
<th>Countries with GDP &lt; 5,000 USD</th>
<th>Countries with GDP between 5,000 and 15,000 USD</th>
<th>Countries with GDP &gt; 15,000 USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Members</td>
<td>45 CHF</td>
<td>72 CHF</td>
<td>345 CHF</td>
</tr>
<tr>
<td>Young Members &lt; 34 years old</td>
<td>30 CHF</td>
<td>45 CHF</td>
<td>72 CHF</td>
</tr>
<tr>
<td>Retired Members 65 years old</td>
<td>30 CHF</td>
<td>60 CHF</td>
<td>90 CHF</td>
</tr>
<tr>
<td>Emeritus</td>
<td>No fee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Honorary</td>
<td>No fee</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>