



Better Training for Safer Food *Initiative*

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**Towards a Sustainable
Use of Plant Protection
Products: "Safe Use -
Identification of
hazards and risks to
humans"**

Presentation outline

A. Hazards and Risks:

- a.1 Definitions
- a.2 Hazard Identification & Characterisation

B. Risk assessment:

- b.1 R.A.: Consumer & Operator
- b.2 Routes of exposure
- b.3 Operator exposure estimation tools

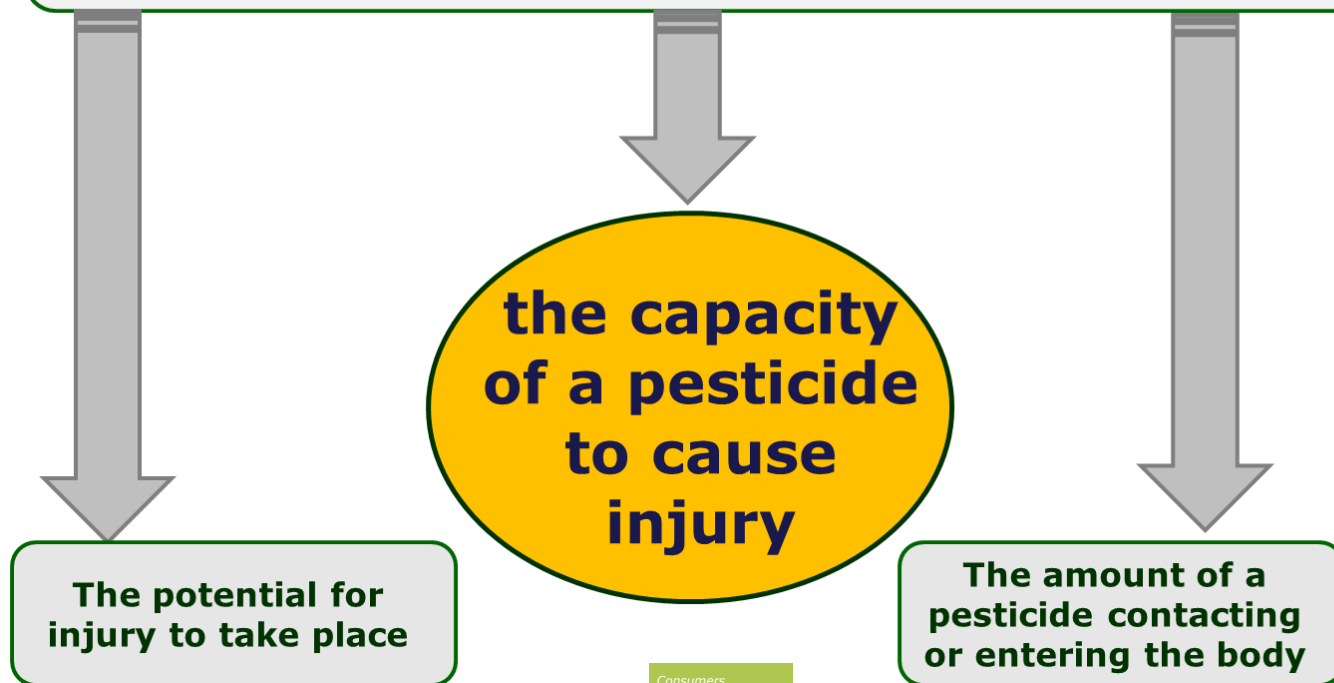
C. Pesticide Label and Safety Data Sheet

- c.1 Interpretation of label and SDS in relation to classification
- c.2 Interpretation of label in relation to safety precautions & PPE recommendations
- c.3 Interpretation of label in relation to first aid measures

A. Hazards and Risks:

a.1 Definitions

$$\text{RISK} = f(x) \text{ Hazard (Toxicity) } \times \text{Exposure}$$



a.2 Hazard Identification & Characterization

«The dose makes the poison»
.... applies in most of the cases for pesticides also.



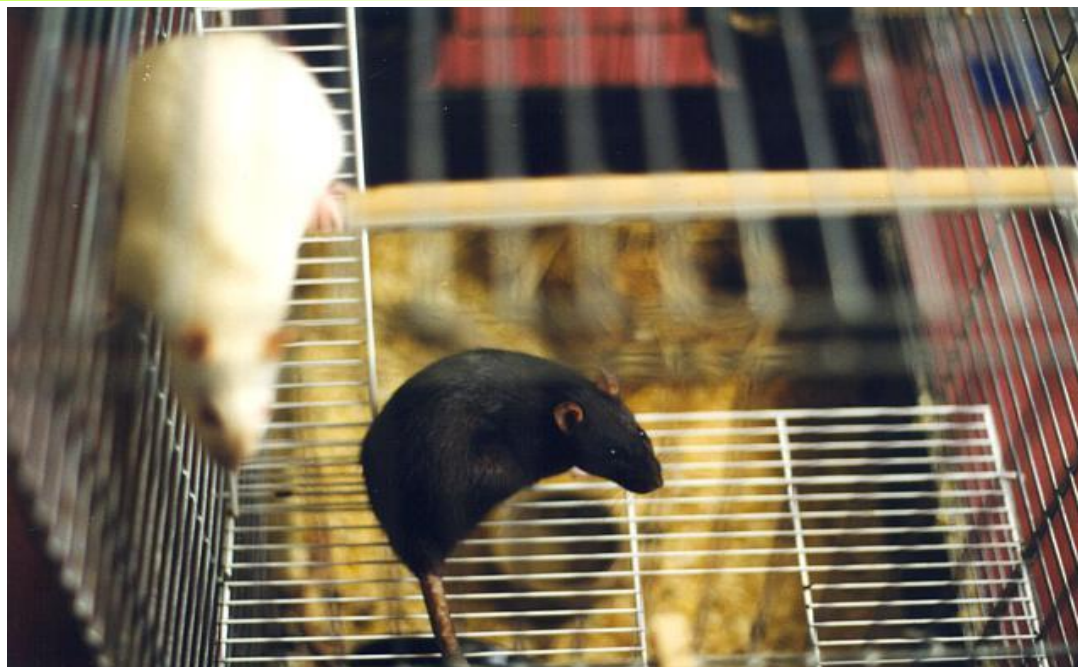
Paracelsus, 1493-1541,
Swiss alchemist & doctor



a.2 Hazard Identification & characterization

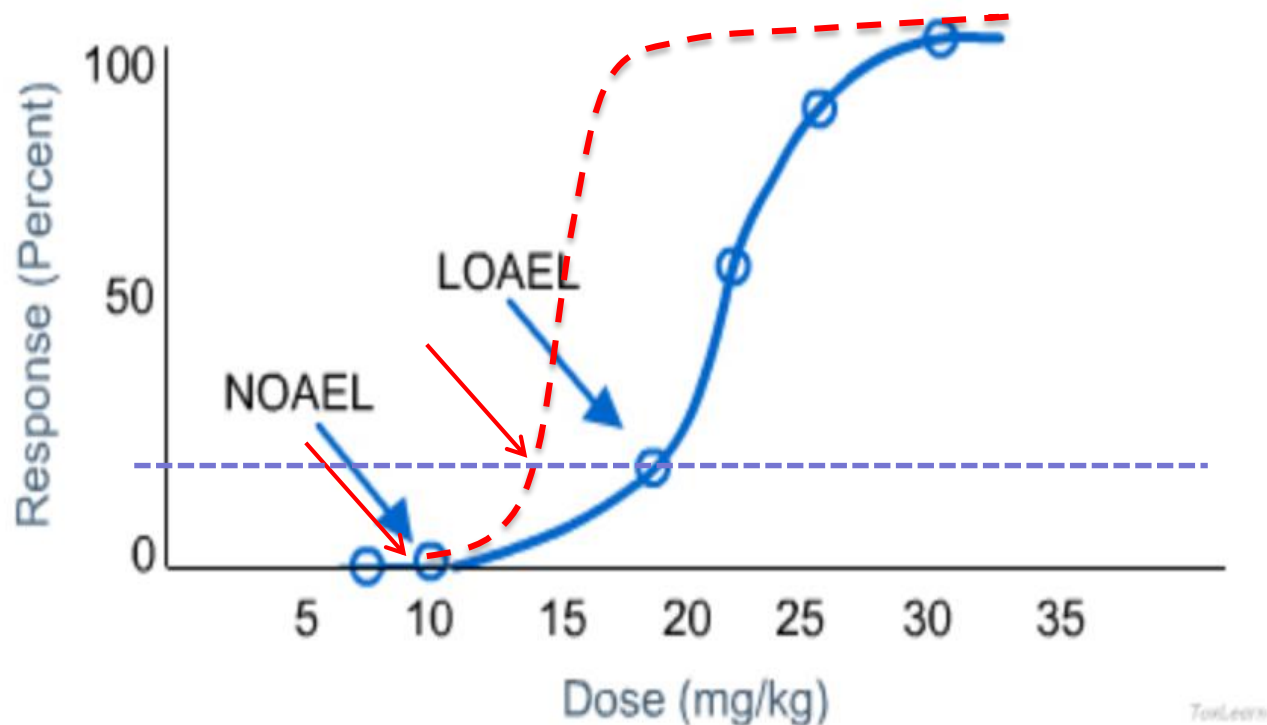
Studies of pesticide effects on mammals

PURPOSE



Prediction of effects in humans

The dose – response curve



NOAEL: Non Adverse Effect Level
LOAEL: Lowest Adverse Effect Level

Types of studies

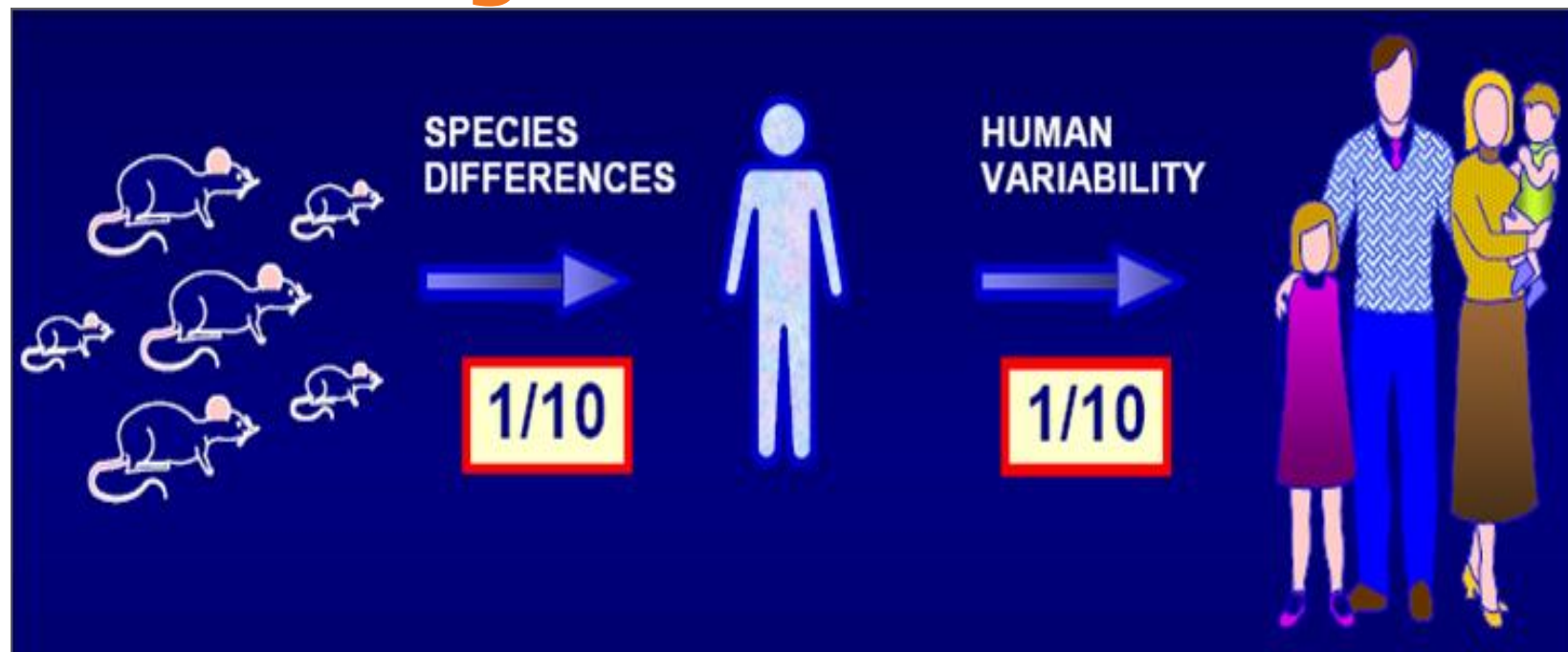
Plant Protection Product

- Acute Oral, Dermal, Inhalation
- Skin & Eye Irritation
- Skin Sensitization
- Supplementary studies
(e.g. combinations of PPPs)
- Exposure data
 - Operator
 - Bystander & Resident
 - Worker
- Dermal absorption
- Toxicological data relating to
formulants

Active & other substances

- Absorption, Distribution, Metabolism,
Excretion
- Acute Oral, Dermal, Inhalation
- Skin & Eye Irritation
- Skin Sensitization & Phototoxicity
- Short term toxicity
- Genotoxicity
- Long term toxicity & Carcinogenicity
- Reproductive toxicity
[Multi-generation – Developmental]
- Neurotoxicity
- Other toxicological studies [Toxicity
studies of metabolites or supplementary
studies on the active substance, e.g.
mechanistic studies]
- Medical data

Setting of threshold values



NOAEL

÷

**Assessment
Factors (100)**

=

**Toxicological
thresholds:
[ADI, AOEL,
ARfD, AAOEL]**

Toxicological Thresholds

ADI: Acceptable Daily Intake – Threshold for lifespan dietary exposure.

ARfD: Acute Reference Dose – Threshold set for compounds that pose risk for effects following single or short term dietary exposure, e.g. acute or subacute effects.

AOEL*: Acceptable Operator Exposure Levels – Threshold for repeated non dietary exposure.

AAOEL: Acute Acceptable Operator Exposure Levels** – Threshold for compounds that pose risk for effects following single or short term non dietary exposure (development of GD for AAOEL setting, priority for EFSA and the Commission).

* In EFSA calculator renamed to: Reference value non acutely toxic active substance (RVNAS)

** In EFSA calculator renamed to: Reference value acutely toxic active substance (RVAAS)



European
Commission

Plant Protection Product database

http://ec.europa.eu/sanco_pesticides/public/?event=homepage&language=EN

European Commission

EU Pesticides database

European Commission > Food Safety > Plants > Pesticides > EU Pesticides Database

HEALTH FOOD ANIMALS **PLANTS**

PESTICIDES

EU rules

EU Pesticides database

Search active substances

Search products

Search pesticide residues

Download MRLs data

Sustainable use of pesticides

Approval of active substances

EU Pesticides database

ACTIVE SUBSTANCES
Regulation (EC) No 1107/2009

PESTICIDES EU-MRLs
Regulation (EC) No 396/2005

Latest active substance updates

Update of national authorisations (except FR and CZ)	02/02/2015
Correction of several approval dates	16/12/2014
Upload of Review Reports taken note of by the PAFF in October 2014 (Section A)	08/12/2014
Upload of Review Reports taken note of by the PAFF in July 2014 (Section B)	27/10/2014
Correction of the AOEL for oxamyl	22/10/2014

Latest MRL updates

Insertion of MRLs for Commission Regulation (EU) No 1127/2014 of 20 October 2014 amending Annexes II and III to Regulation (EC) No 396/2005 of the European Parliament and of the Council as regards maximum residue levels for amitrole, dinocap, fipronil, flufenacet, pendimethalin, propyzamide, and pyridate in or on certain products	12/12/2014
Insertion of MRLs for Commission Regulation (EU) No 1096/2014 of 15 October 2014 amending Annexes II, III and IV to Regulation (EC) No 396/2005 of the	20/11/2014

Consumers,
Health And Food
Executive Agency

B. Risk Assessment

RISK

**Acceptable or
Not acceptable**

?



b.1 Consumer Risk Assessment

For consumer protection:
Compare the
ADI to the sum of
Maximum Residue Limits
(MRLs) of a specific
pesticide in the different
foods consumed

$$\sum MRL \leq ADI$$



MRL_v

b.1 Operator, Worker, Bystander, Resident Risk Assessment

For the protection
of the operator,
worker, bystander
and resident:
Compare the
AOEL to the
Exposure

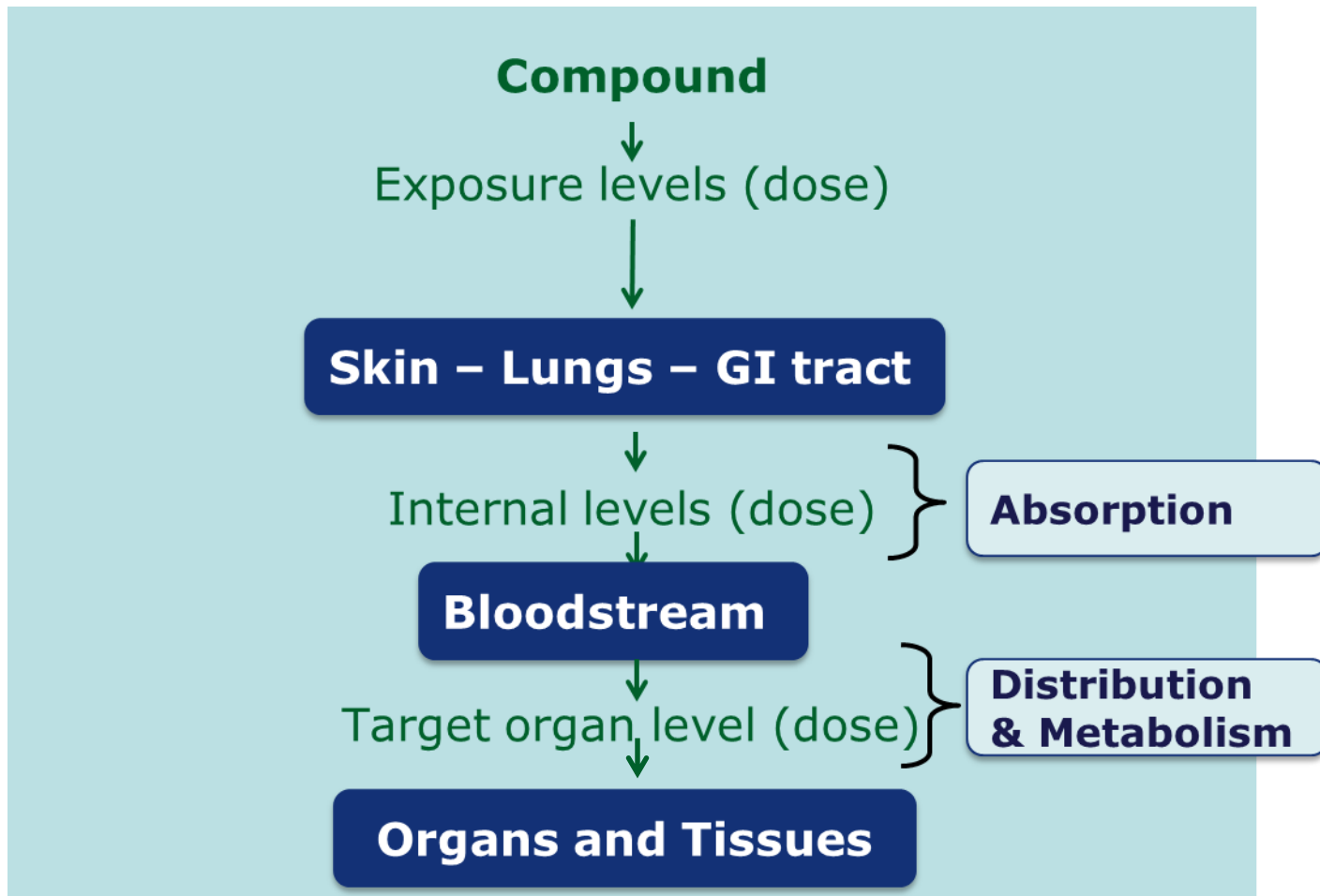
$$E < AOEL$$



b.2 Routes of exposure to pesticides and their entrance in the organism



Exposure v.s. internal dose



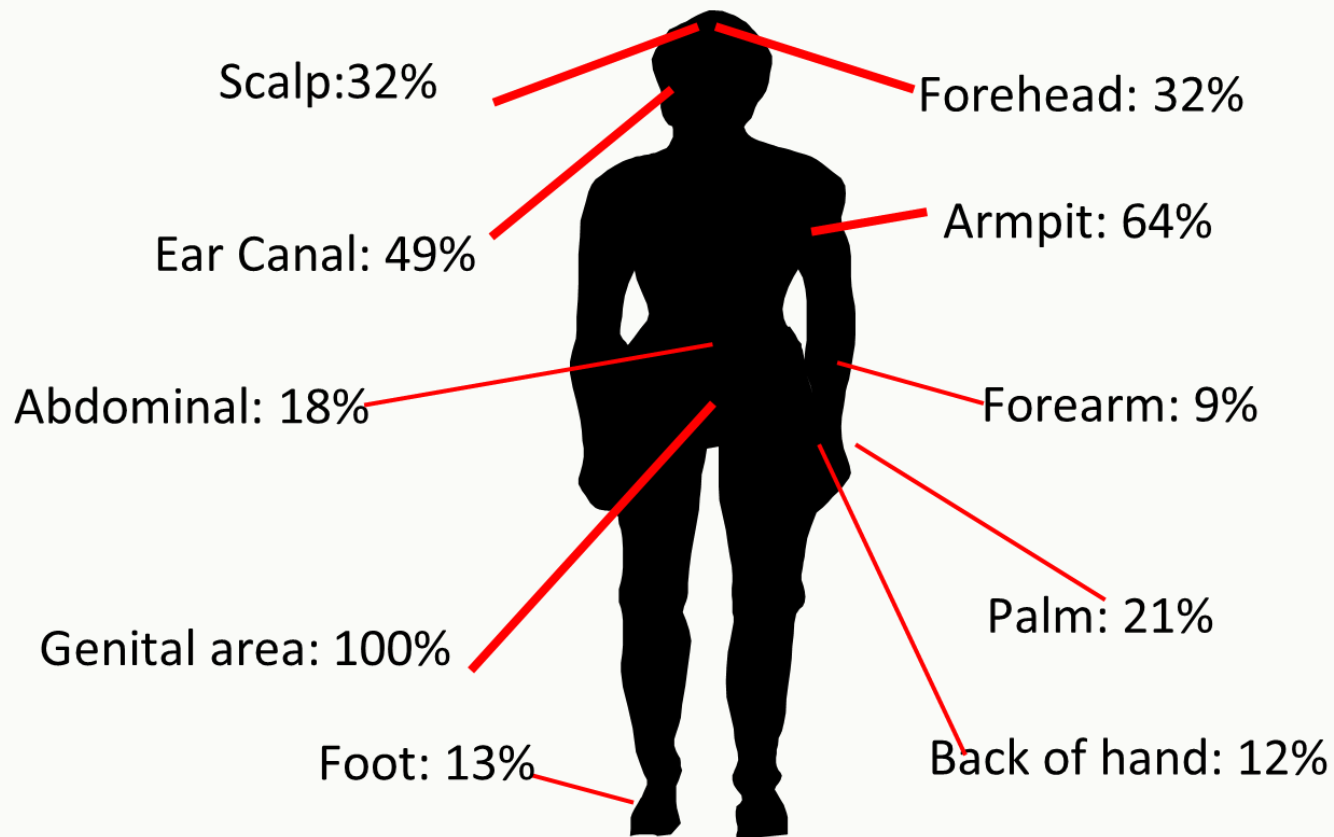
SKIN: Dermal route of exposure*



97% of all body exposure during application is by skin contact.



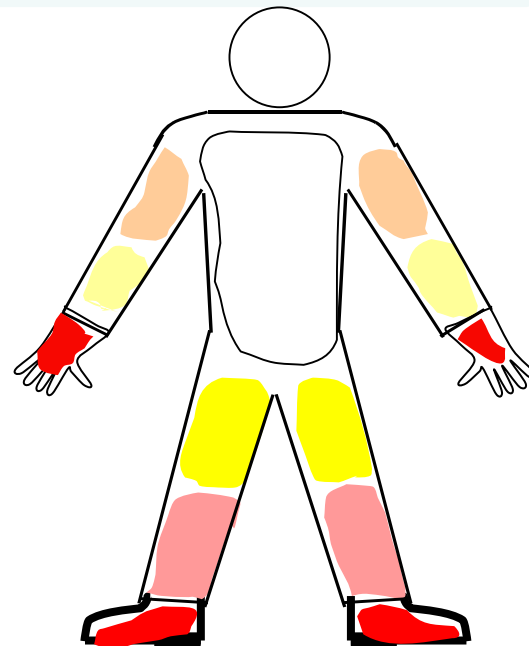
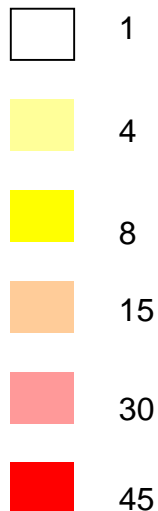
Different parts of the body vary in their ability to absorb pesticides*



Distribution of spray solution in the different body parts

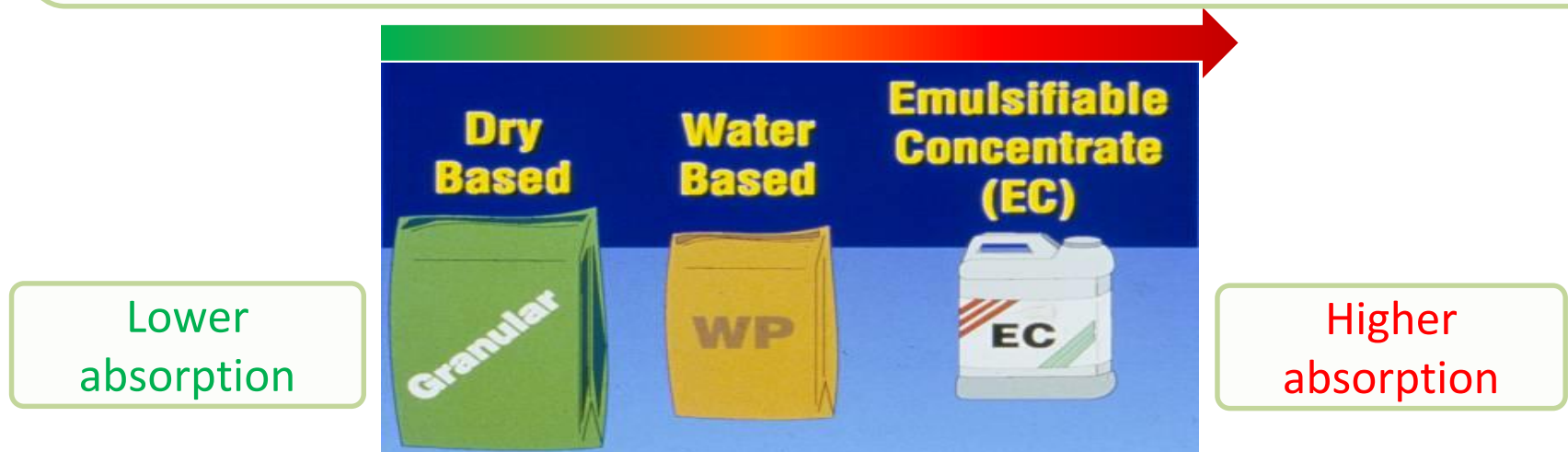
Measurements after herbicide application

% total exposure



Factors that influence the dermal absorption*:

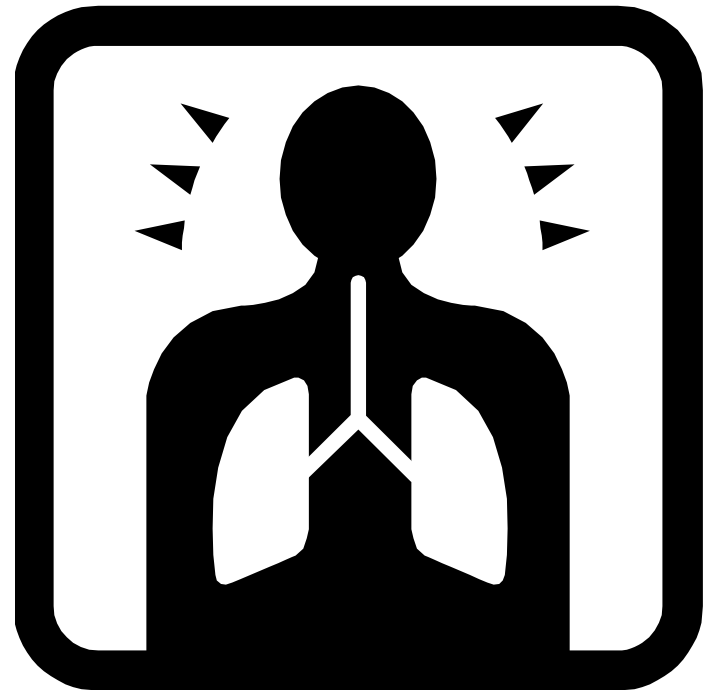
- Different anatomical sites...
- Warm and moist areas with increased blood vessels
- Skin condition such as cuts, abrasions and rashes
- Type of pesticide formulation



LUNGS: Route of entry *via* inhalation*

Exposure *via* Inhalation can occur:

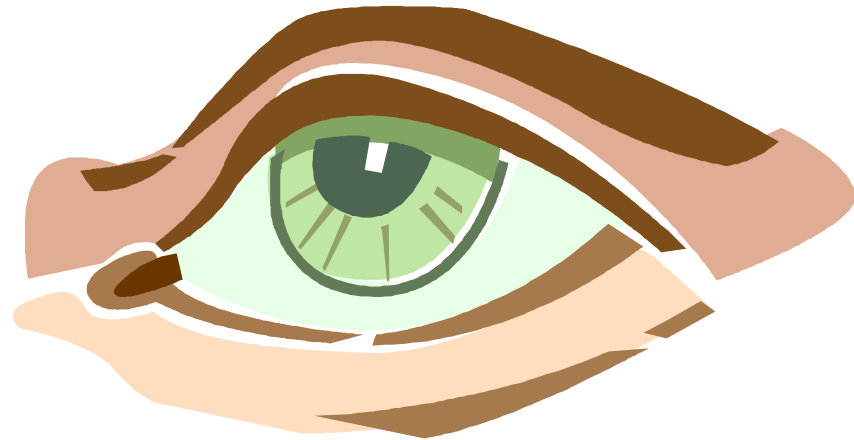
- When using wettable powders, dusts, gases, vapors and sprays
- While mixing and loading pesticides
- During application



EYES* :

Entry *via* mucous membranes and microcapillaries

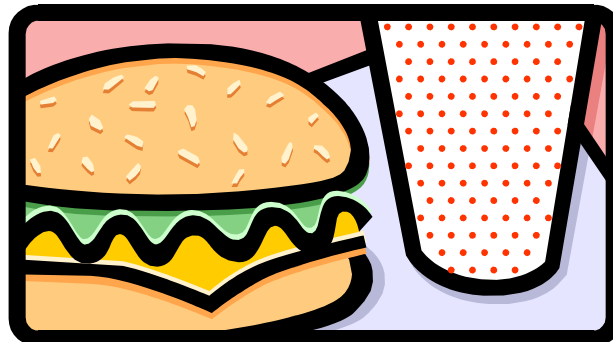
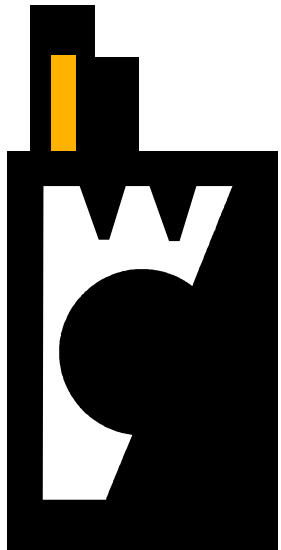
- Eyes are able to absorb surprisingly large amounts.
- Local effects can be produced, from irritation to irreversible injuries.



MOUTH: oral route of exposure*

WASH YOUR HANDS!! →

→ Before eating, drinking, smoking or going to the bathroom, at breaks and before using your mobile phone.



Routes of exposure to pesticides and their entrance in the organism

1. SKIN: dermal exposure (COVERALL & GLOVES)
2. RESPIRATORY TRACT: exposure by inhalation (MASK)
3. MOUTH: exposure by swallowing (MASK, FACE SHIELD & BASIC PRECAUTIONS)
4. EYES: via mucosal membranes (PROTECTIVE GOGGLES & FACE SHIELD)

REDUCTION OF THE AMOUNT THAT ENTERS INTO THE SYSTEMIC CIRCULATION:

Thorough washing of the whole body with water & soap after the pesticide application (reduction of exposure >60%).

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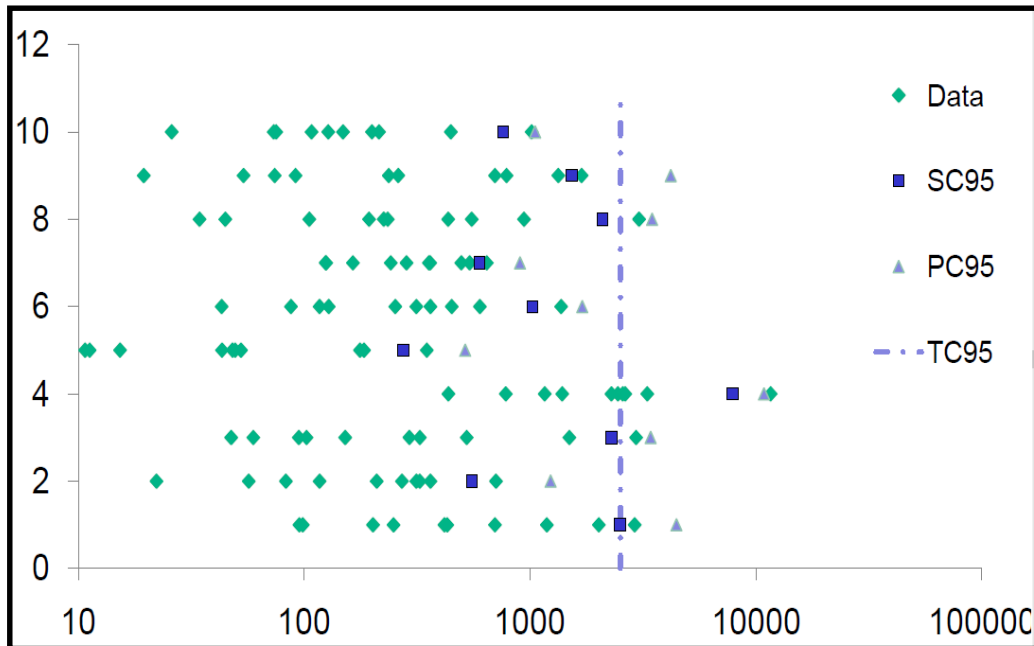
- b.1 R.A.: Consumer & Operator
- b.2 Routes of exposure
- b.3 Operator exposure estimation tools**

C. Pesticide Label

- c.1 Product labelling & classification
- c.2 Interpretation of label in relation to safety precautions
& PPE recommendations
- c.3 Product safety data sheet and First aid measures

b.3 Operator exposure estimation tools

The **operator exposure levels** to pesticides can be estimated either with mathematical models of measured from field studies.



The currently used OPEX estimation models

German Model
outdoor

UK POEM
outdoor

EUROPOEM data (outdoor & indoor)

Dutch Greenhouse Model

ECPA Southern European Greenhouse Model

Seed TROPEX (seed treatment & loading calibration bagging,
sowing of treated seeds)

Higher tier data: Exposure measurements from relevant
studies (type of PPP's & application pattern, mixing loading)

New exposure estimation tool, Operator, Worker, Bystander & Resident

EFSA Calculator

EFSA Guidance, 2014



Background document:

EFSA, 2008b. Project to assess current approaches and knowledge with a view to develop a Guidance Document for pesticide exposure assessment for workers, operators, bystanders and residents, EFSA AGREEMENT NUMBER: EFSA/PPR/2007/01, FINAL REPORT, 28 NOVEMBER 2008.

Guidance on the assessment of exposure of operators, workers, residents and bystanders in risk assessment for plant protection products

EFSA Journal 2014;12(10):3874[55 pp.]. doi:10.2903/j.efsa.2014.3874

European Food Safety Authority

Acknowledgment ▾

Contact ▾

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Affiliation: European Food Safety Authority (EFSA), Parma, Italy

[Article](#)  (1.0 Mb)



 [Send](#)  [Print](#)  [Cite](#)

[Excel calculator](#)  (0.1 Mb)



Abstract

Regulation (EC) No 1107/2009 ensures that the residues of plant protection products (PPPs), consequent to application consistent with good plant protection practice and having regard to realistic conditions of use, shall not have any harmful effects

C. Pesticide Label and Product safety Data Sheet



Product type:
Wettable Powder

Type of PPP →

Pictograms

Warnings

Precautions

Toxicology

Symptoms of poisoning

First aid

Note of physician

The Product Safety Data Sheet (SDS)

L 132/8

EN

Official Journal of the European Union

29.5.2015

COMMISSION REGULATION (EU) 2015/830

of 28 May 2015

amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the
Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)



**Guidance on the compilation
of safety data sheets
according to the requirements
in place from 1 June 2015**

http://echa.europa.eu/documents/10162/13643/sds_en.pdf



Guidance on the
compilation of
safety data sheets

Version 3.0
August 2015

What is a **PRODUCT SAFETY DATA SHEET**

2.1 Definition of a Safety Data Sheet (an SDS)

- An SDS is aimed to provide information about a substance or mixture for use in workplace.
- It is used as a source of information about hazards, including environmental hazards, and to obtain advice on safety precautions.
- To be used: at workplace (e.g. professional use of pesticides), consumers, for transport of dangerous goods, in emergency situations (including poison centers)

c.1

Interpretation of label and SDS in relation to product classification

The legal framework for Hazard Classification

...the new CLP (GHS) system










REGULATION (EC) No 1272/2008 of The European Parliament and of the Council of the 16th December 2008
on Classification, Labelling and Packaging (CLP Regulation) of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1097/2006

With this Regulation (CLP) the internationally agreed criteria in the Globally Harmonized System are incorporated into Community Law

Entry into force

Substances: 1 December 2010, Mixtures: 1 June 2015

Essential elements on a PPP Label

Hazard pictograms	 flammable  explosive  flammable & explosive  fatal toxic  Allergen CMR STOT  gas under pressure  Corrosive to metals skin burns eye dmg  harmful irritant allergen  allergen CMR STOT
Signal words	Danger Warning
Hazard statements	H200 - H290: hazard statements for physical hazards H300 - H373: hazard statements for health hazards H400 - H413: hazard statements for environmental hazards
Precautionary statements	P101 – P103: precautionary statements – general P201 – P285: precautionary statements – prevention P301 – P391: precautionary statements – response P401 – P422: precautionary statements – storage P501 : precautionary statements – disposal

c.2

Interpretation of label and SDS in relation to safety precautions and PPE recommendations

What are the determinants for PPE recommendations?

a

The hazardous properties of active ingredient(s) and co-formulants (C,M,R, EDs)

b

Risk for the operator & worker

PPE recommendations on
Pesticide Label



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Signal word:

Warning

Hazard class (health effects):

Causes serious eye irritation

Suspected of causing cancer

PPE (statement of prevention):

Wear protective gloves / protective clothing / eye protection / face protection

Rovral® WG

A protectant fungicide for the control of a wide range of fungal diseases in agricultural and horticultural crops

A water dispersible granule containing 750 g/kg iprodione.

Risk and Safety Information

Warning:

Causes serious eye irritation.

Very toxic to aquatic life with long lasting effects.

Suspected of causing cancer.

Wear protective gloves/protective clothing/eye protection/face protection.

Obtain special instructions before use.

If in eyes: rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If exposed or concerned: get medical advice/attention.

Collect spillage.

This material and its container must be disposed of in a safe way.

Dispose of contents/container to a licensed waste disposal contractor or collection site except for triple rinsed empty containers which can be disposed of as non-hazardous waste.

Conventional Sprayer:

To protect aquatic organisms respect an unsprayed buffer zone of 5m to surface water bodies.

Air Assisted Sprayer:

To protect aquatic organisms respect an unsprayed buffer zone of 15m to surface water bodies.

To avoid risks to human health and the environment,

comply with the instructions for use.

Authorization holder:

BASF plc, P.O. Box 4,
Earl Road, Cheadle Hulme,
Cheshire, SK8 6QG, UK

1 kg



Supplied by:
BASF Ireland Limited
P.O. Box 4, Earl Road
Cheadle Hulme, CHEADLE
Cheshire SK8 6QG, UK
Tel: 01 825 5701
Fax: 01 825 2038
Emergency Information
(24 hours freephone):
0049 180 227 3112
Technical Enquiries:
0044 (0)845 602 2553
(office hours)

PCS No.: 02729



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No Hazard Classification



This product is a soluble concentrate containing 360 g/l (30.77 % ww) glyphosate, present as 480 g/l (41.6 % ww) of the isopropylamine salt of glyphosate.

Degraded by micro-organisms / microbes in the soil.

A foliar applied translocated herbicide for the control of emerged annual and perennial grass and broad-leaved weeds in industrial and amenity situations, around the farm and non-crop areas.

IE, 0704, F - 1067 4343

PCS Number: 02314



5 411773 027319 >

e 1 Litre

VVP-EMB Monsanto B-2040
© Monsanto Apt. 2007 (MdB)
Lot Number / Production Date:



PPE:

Wear suitable gloves

PEEL HERE FOR DIRECTIONS FOR USE



FOR USE ONLY AS A NON-SELECTIVE HERBICIDE
IN NON-CROP AREAS.

SAFETY INFORMATION

KEEP OUT OF REACH OF CHILDREN.

WEAR SUITABLE GLOVES.

KEEP AWAY FROM FOOD, DRINK AND ANIMAL FEEDING STUFFS.

IF SWALLOWED, SEEK MEDICAL ADVICE IMMEDIATELY AND
SHOW THIS CONTAINER OR LABEL.

THIS MATERIAL AND ITS CONTAINER MUST BE DISPOSED OF IN A
SAFE WAY.

To avoid risks to man and the environment, comply with
the instructions for use.

PCS Number: 02314

Marketed in Ireland by:

MONSANTO IRELAND LIMITED

Unit C2, Dunshaughlin Business Park

Dunshaughlin, County Meath

Tel.: (01) 825 0555 / 825 0574, Fax: (01) 825 0570

Authorisation holder:

MONSANTO UK LIMITED

The Maris Centre, 45 Hauxton Road

Trumpington, Cambridge, CB2 9LQ, UK

In case of emergency day or night, telephone Chemical
Emergency Centre: 00 44 1865 407333

READ CAREFULLY THE RECOMMENDATIONS FOR USE
ATTACHED TO THIS CONTAINER

All users must ensure that they have read this leaflet and
follow its advice before using the product.

Protect from frost.

Imported

Roundup®, Biactive®, Monsanto® and the Vine symbol are registered trade
marks of Monsanto Technology LLC.
Not for reformulation or repackaging.
No licence is granted under any patent.

PPE recommendations on a Pesticide Label

Code	Prevention precautionary statement	Hazard class	Hazard category
P280	Wear protective gloves/protective clothing/eye protection/face protection.	Acute toxicity - dermal	1, 2, 3, 4
		Skin corrosion	1A, 1B, 1C
		Skin / eye irritation	2
		Skin sensitization / serious eye damage/irritation	1
P284	Wear respiratory protection	Acute toxicity — inhalation	1, 2
P285	In case of inadequate ventilation wear respiratory protection.	Respiratory sensitisation	1

The importance of pesticide label -Application rate & PPE

*Recommended application rate: 7.5 L product/ha (1.125 kg a.i./ha), Spray volume: 500 L/ha,
Treated area: 5 ha/day - field crop; tractor mounted*

Estimation of operator exposure (acc. to the German model)

Active substance (a.s.)	glufosinate ammonium	
Product	BASTA 15 SL	
Intended use(s)	olive trees	
	Field Crops, Tractor Mounted (FCTM)	
Type of preparation	Liquid	
Application rate (AR)	1.125	kg a.s./ha
Treated area per day (A)	5	ha/d
Systemic AOEL	0.0021	mg/kg bw/d
Dermal absorption (DA)	16	% for mixing/loading (m/l)
	14	% for application (appl.)
Inhalation absorption (IA)	100	%
Body weight (BW)	70	kg

No PPE: exposure levels,
exceeded AOEL
by **2600%**

With PPE: **98%** AOEL

Application rate + 10%

No PPE: exposure levels
exceeded AOEL
by **2825%**

With PPE: **108%** AOEL

c.3

Interpretation of label and SDS in relation to first aid measures

1st aid measures & precautionary statements

- Annex IV to Regulation (EC) 1272/2008: list of precautionary statements

P101 – P103: precautionary statements – general

P201 – P285: precautionary statements – prevention

P301 – P391: precautionary statements – response *{considered under first aid measures due to their purpose}*

P401 – P422: precautionary statements – storage

P501: precautionary statements – disposal

First-aid measures: Regulation (EC) 1272/2008

(Table 6.2 - Precautionary statements — Response)

Code	<u>Response</u> precautionary statement	Hazard class	Hazard category
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.	Acute toxicity — oral	1, 2, 3
		Aspiration hazard	1
P301 + P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.	Acute toxicity — oral	4
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.	Skin corrosion	1A, 1B, 1C
P302 + P334	IF ON SKIN: Immerse in cool water/wrap in wet bandages.	Pyrophoric liquids	1
P302 + P350	IF ON SKIN: Gently wash with plenty of soap and water.	Acute toxicity — dermal	1, 2
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.	Acute toxicity — dermal	3, 4
		Skin irritation	2
		Skin sensitisation	1, 1A, 1B
P303 + P361 + P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/ shower.	Flammable liquids	1, 2, 3
		Skin corrosion	1A, 1B, 1C

First-aid measures (2)

Code	Response precautionary statement	Hazard class	Hazard category
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.	Acute toxicity — inhalation	1, 2, 3, 4
		Skin corrosion	1A, 1B, 1C
		Specific target organ toxicity — single exposure; respiratory tract irritation	3
		Specific target organ toxicity — single exposure; narcosis	3
P304 + P341	IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.	Respiratory sensitisation	
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.	Skin corrosion	1A, 1B, 1C
		Serious eye damage/eye irritation	1
		Eye irritation	2
P306 + P360	IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.	Oxidising liquids	1
		Oxidising solids	1

First-aid measures (3)

Code	Response precautionary statement	Hazard class	Hazard category
P307 + P311	IF exposed: Call a POISON CENTER or doctor/physician.	Specific target organ toxicity — single exposure	1
P308 + P313	IF exposed or concerned: Get medical advice/attention.	Germ cell mutagenicity	1A, 1B, 2
		Carcinogenicity	1A, 1B, 2
		Reproductive toxicity	1A, 1B, 2
		Reproductive toxicity — effects on or via lactation	Additional category
P309 + P311	IF exposed or if you feel unwell: Call a POISON CENTER or doctor/ physician.	Specific target organ toxicity — single exposure	2
P332 + P313	If skin irritation occurs: Get medical advice/attention.	Skin irritation	2
P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.	Skin sensitisation	1, 1A, 1B
P335 + P334	Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.	Pyrophoric solids	1
		Substances and mixtures which, in contact with water, emit flammable gases	1, 2



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First-aid measures (4)

Code	Response precautionary statement	Hazard class	Hazard category
P337 + P313	If eye irritation persists: Get medical advice/attention.	Eye irritation	2
P342 + P311	If experiencing respiratory symptoms: Call a POISON CENTRE or doctor/ physician.	Respiratory sensitisation	1, 1A, 1B
P370 + P376	In case of fire: Stop leak if safe to do so.	Oxidizing gases	1
P370 + P378	In case of fire: Use ... for extinction. <i>[... Manufacturer/supplier to specify appropriate media. — if water increases risk.]</i>	Flammable liquids	1, 2, 3
		Flammable solids	1, 2
		Self-reactive substances and mixtures	A, B, C, D, E, F
		Pyrophoric liquids	1
		Pyrophoric solids	1
		Substances and mixtures which, in contact with water, emit flammable gases	1, 2, 3
		Oxidising liquids	1, 2, 3
		Oxidising solids	1, 2, 3



First-aid measures (5)

Code	Response precautionary statement	Hazard class	Hazard category
P370 + P380	In case of fire: Evacuate area.	Explosives	Divisions 1.1, 1.2, 1.3, 1.4, 1.5
P370 + P380 + P375	In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.	Self-reactive substances and mixtures	Types A, B
P371 + P380 + P375	In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.	Oxidising liquids	1
		Oxidising solids	1

Further reading: The EU Legislation

DIRECTIVE 2009/128/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides

Reg. (EC) 283/2013: COMMISSION REGULATION (EU) No 283/2013 of 1 March 2013 setting out the data requirements for active substances, in accordance with Regulation (EC) No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market

Reg. (EC) 284/2013 : COMMISSION REGULATION (EU) No 284/2013 of 1 March 2013 setting out the data requirements for plant protection products, in accordance with Regulation (EC) No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market

Dir. 1999/45/EC DIRECTIVE 1999/45/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations

Dir. 67/548/EEC: COUNCIL DIRECTIVE of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances (67/548/EEC) This Directive has been amended several times. Regulation (EC) No 1272/2008 has made remarkable modifications, and it shall repeal directive 67/548/EEC from 1 June 2015 by introducing the Globally Harmonised System of Classification and Labelling of Chemicals (GHS).

Further reading: The EU Legislation

Reg. (EC) 1107/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC

Reg. (EC) 547/2011 COMMISSION REGULATION (EU) No 547/2011 of 8 June 2011 implementing Regulation (EC) No 1107/2009 of the European Parliament and of the Council as regards labelling requirements for plant protection products

Reg. (EC) 1272/2008 REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (Text with EEA relevance)

DIRECTIVE 2009/128/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides

Calculation models

- http://www.bvl.bund.de/EN/04_PlantProtectionProducts/11_Applicants/02_AuthorisationProcedure/06_Toxicology/PlantProtectionProducts_toxicol_node.html
- <http://www.efsa.europa.eu/en/efsajournal/pub/3874.htm>

***Reference:** Carol Ramsay, Pesticide Education Specialist, Washington State University



Thank you for your attention!

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