

# Pesticide use and food safety



European  
Crop Protection

# Contents

Ensuring the correct use of pesticides	1
Measuring residue levels	2
Measuring safety: ADI and ARfD	4
Exceeding Maximum Residue Levels	5
Import tolerances	6
Why do MRL exceedances occur?	7
How to correctly and safely use crop protection products	8
What influences residue levels?	9



# Ensuring the correct use of pesticides

Just like medicines, crop protection products are subject to regulations.

The safety of these products is reviewed by independent authorities before they are allowed to be used on crops.

Farmers must comply with Good Agricultural Practice (GAP), following the basic principle of **using pesticides as little as possible and only when necessary**.

The use of pesticides is authorised only after an independent expert risk assessment has checked that any residues remaining after correct use of the product will not lead to any consumer concern. The potential residues on a harvested crop are regulated by a maximum level (MRL) which is set **As Low As Reasonably Achievable**; the **ALARA** principle. The MRL is an important trading standard.

**Maximum Residue Levels (MRLs)** can also help verify that a pesticide has been correctly applied.

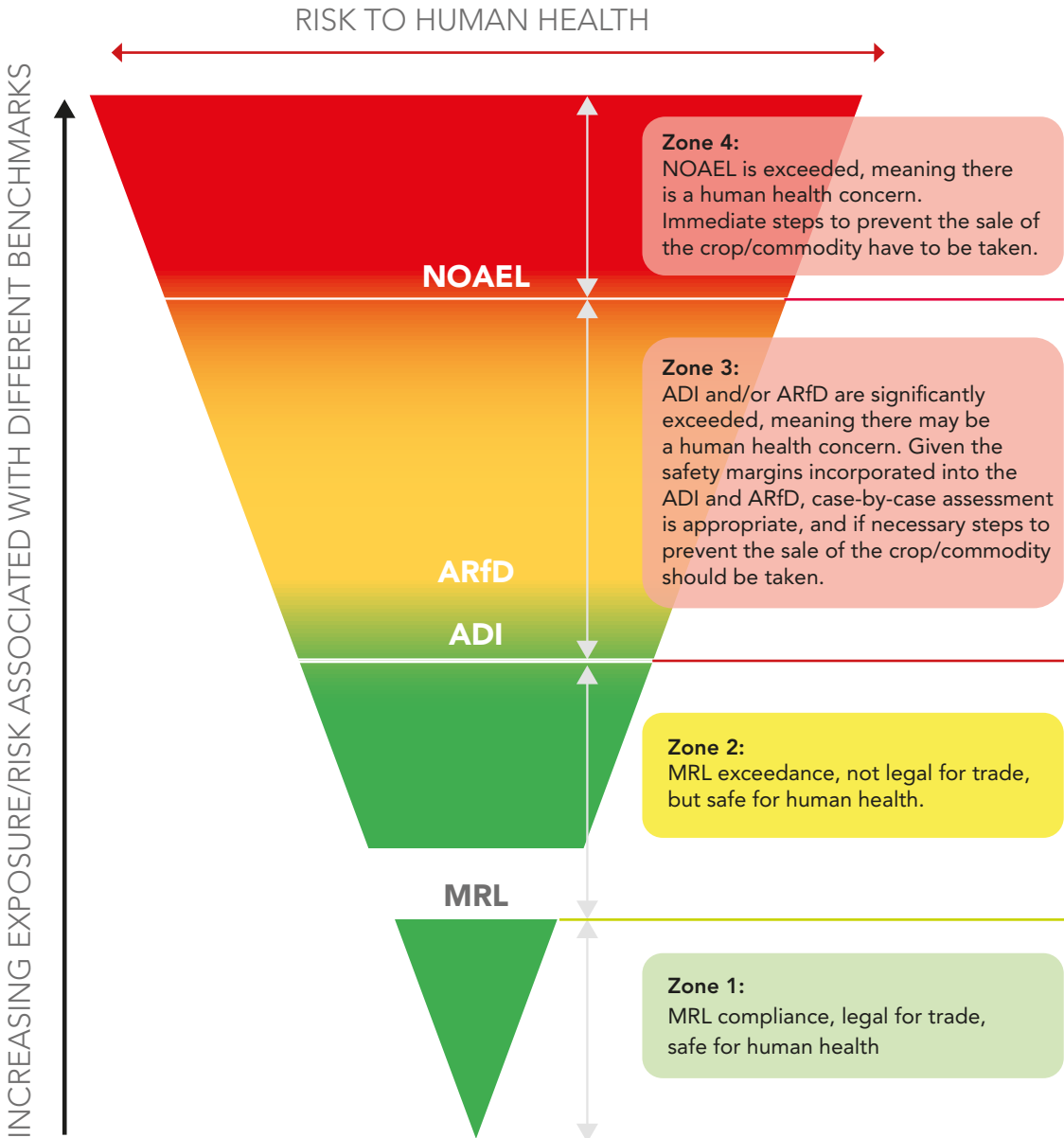
In the EU MRLs are set by the European Commission following a regulatory process involving the European Food Safety Authority (EFSA) and Member States.

**Pesticide residues** are traces of crop protection products on or in the harvested product.

**Pesticide residues – What are Maximum Residue Levels (MRLs), and is my food safe?**  
Watch ECPA's explanatory video. This and more at <http://www.youtube.com/user/eurocropprotection/videos>



# Measuring residue levels





### **NOAEL**

**(No Observable Adverse Effect Level):**

The highest exposure level at which no adverse effects can be identified in tests.

### **ARfD (Acute Reference Dose):**

A toxicological safety limit specifying the amount of a substance which can be ingested on a single day without any effects on the health of the consumer.

### **ADI (Acceptable Daily Intake):**

A toxicological safety limit specifying the amount of a substance which can be ingested every day over an entire lifetime without any recognisable risks to the health of the consumer.

ADI and ARfD are calculated by dividing the NOAEL by a factor of at least 100

### **MRL (Maximum Residue Level):**

A legally fixed maximum concentration for a particular active ingredient in a particular crop.

A trade standard, intended primarily to check that a pesticide has been applied correctly.

Maximum residue levels (MRLs) are not toxicological safety limits. They are a commercial standard, indicating the legally allowed maximum amount of an active ingredient which may be present as a residue in or on an unprocessed raw product (such as an unpeeled banana or orange). In other words, they serve to verify whether a crop protection product has been correctly applied or not.

# Measuring safety: ADI and ARfD

As required by EU law, the ADI and ARfD are obtained through animal testing and are based on the highest dose where no recognisable harmful effects are observed; the **No Observable Adverse Effect Level (NOAEL)**. In accordance with international practice, the NOAEL is divided by an uncertainty factor of at least 100 to compensate for potential differences between animals and humans – and for differences between individuals. Since the NOAEL may differ for chronic (long term) and acute (short term) effects, the ADI and ARfD may be set at different levels.

Before an active ingredient can be authorised, a dietary risk assessment is conducted in order to ensure that the potential chronic and acute exposure of consumers to residues remains below the ADI and ARfD, respectively.

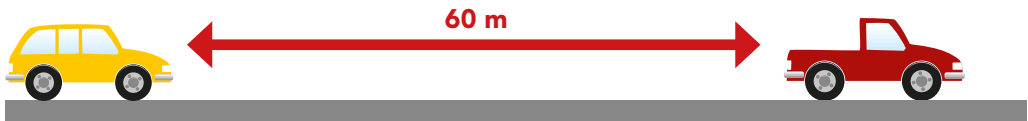
Authorisation is granted only if the maximum residue levels are shown to be safe under a set of “worst case” assumptions.

Consumer protection is ensured through toxicologically based safety limits:

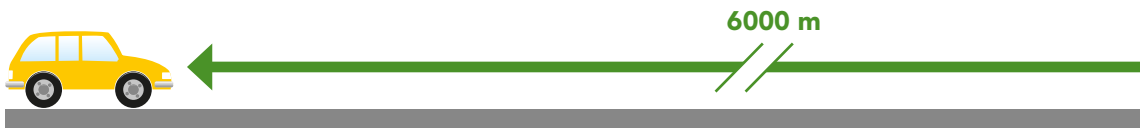
**The ADI (Acceptable Daily Intake)** refers to the maximum quantity of a substance which can be consumed every day for a lifetime without harm to the consumer.

**The ARfD (Acute Reference Dose)** refers to the maximum quantity of a substance that can be ingested in a single day without any harm to the consumer.

## The safety factor of 100 applied to road traffic



At a speed of 120 km/h (75 mph) a distance of 60 metres (200 feet) to the car in front is required to avoid a rear-end collision.



A safety factor of 100 requires at 120 km/h (75 mph) a distance of 6,000 metres (20,000 feet) to the car in front.

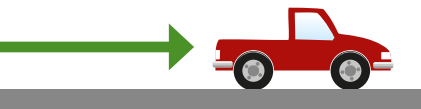
Source: IVA, 2008

# Exceeding Maximum Residue Levels

Exceeding the Maximum Residue Levels does not necessarily imply a risk to health. However, it usually indicates that a pesticide **has been incorrectly used. Food products which have residues exceeding MRL cannot be placed on the market.**

When a farmer uses a pesticide according to the label instructions and Good Agricultural Practice (GAP), the residues in crop at harvest do normally not exceed the Maximum Residue Level established in the country of use.

However, since MRLs are not harmonised worldwide, MRL exceedances can occur when products are exported to a country with a lower MRL for the specific pesticide and crop combination.



# Import tolerances

To overcome the problem of non-harmonised MRLs, **import tolerances** have been established.

## MRLs in international trade with non-EU countries

An MRL is usually only established when a pesticide is needed for local farmers to control weeds, pests and diseases. For example, the UK has no pesticides authorised for use on bananas as the fruit is not grown locally.

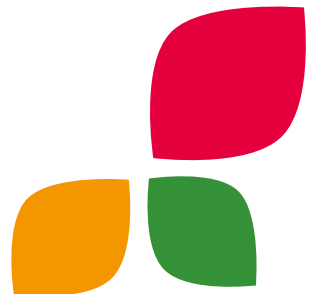
Other reasons for MRL differences are due to local conditions – for example, a wetter climate may result in heavier fungal infestation, requiring different levels of fungicide application.

These MRLs are called “import tolerances” and they also have to comply with the same high safety standards. Import tolerances facilitate international trade.

An import tolerance is a Maximum Residue Level that is set based on uses registered in foreign countries in order to allow the import of treated commodities from abroad and facilitate international trade.

Import tolerances can be requested, provided specific criteria are met, if a trader wishes to import a commodity:

- Containing residues of a substance used in the EU but where the commodity is not produced in the EU (e.g. papayas);
- Treated with a substance no longer or not yet used in the EU; or
- Treated with a substance in use in the EU but where the GAP registered in the exporting country is likely to result in higher residues than the EU's GAP.





# Why do MRL exceedances occur?

MRL exceedances can occur due to the following reasons:

- The crop protection product was not used according to label instructions:
  - a) The minimum waiting period between application of the pesticide and harvest was not respected;
  - b) Incorrect pesticide dosing was used;
  - c) The crop protection product safety instructions regarding the storage, use and cleaning of material were not respected;
- The crop protection product was not registered for the respective country and/or was used illegally;
- Authorised pesticides were used in non-authorised commodities;
- Recent changes in a large number of agricultural practices due to the withdrawal of many pesticides from the market;
- The food product was imported from a country outside the EU and the use was not covered by a suitable MRL / import tolerance in the EU;
- Environmental contamination;
- Change of EU MRLs standards.

Other exceptional cases include:

- Spray drift from neighbouring treated fields;
- Contamination of crops during storage;
- Unfavourable weather conditions resulting in reduced residue decline rates;
- Presence of naturally occurring substances which mimic the occurrence of pesticides or metabolites on food (e.g. carbon disulfide in brassica vegetables).



# How to correctly and safely use crop protection products

- Observe the crops for timely detection of any problem;
- Carefully read the label instructions of the crop protection product and/or
- Consult a technician to know what crop protection products are recommended to be used with your crop and the type of weeds and diseases affecting it;
- The crop protection products you use must be registered in your country and for the particular crop you want to treat;
- If the crop is intended to be exported check that the use of the crop protection product is covered by suitable MRLs / import tolerances in the potential countries of destination (in case of doubt consult an expert);
- Expired crop protection products or chemicals in bad state should not be used (verify expiration date);
- Apply only the required proportion of crop protection products according to the label instructions;
- Respect the waiting time between applications;
- Respect the pre-harvest interval (the date at which you can make the last application before harvesting);
- Do not enter the plantation immediately after application;
- Keep an accurate record of the crop protection products you have used.



# What influences residue levels?

## **Properties of the active ingredient and formulation**

All crop protection products degrade with time. Different active ingredients and formulations lead to different degradation rates.

## **Regional cultivation and site conditions**

Factors like hours of sunlight, temperature and rainfall influence degradation and thus residue levels.

## **Period of time**

More time between the application of a crop protection product and the harvest usually means more time for degradation resulting in reduced residue levels.

## **Type of crop**

The type of crop is also an important factor. For example, the roots of potatoes and carrots are protected from direct spraying as they are below the surface of the soil.

## **Pest infestation**

Pest infestation influences the timing and rate of applications.

## **Plant health**

Higher residues are likely to occur if the crop does not develop properly (e.g. due to drought).



# Our network

## Corporate Member Companies



BASF



Bayer CropScience



Dow AgroSciences



DuPont de Nemours



Makhteshim Agan



Monsanto Europe



Syngenta

## Associate & SME Member Companies



Arysta LifeScience



Certis Europe



Cheminova



Chemtura Europe



FMC



Gowan Company



ISK Biosciences Europe



Janssen Pharmaceutica



Nufarm



SIPCAM



Sumitomo Chemical



Taminco



United Phosphorus Ltd

## Full Member Associations



Austria  
FCIO – Fachverband  
der Chemischen Industrie  
Oesterreichs



Belgium  
Phytofar – Belgische  
Vereniging voor de Industrie  
van phytosanitaire producten  
Association Belge de l'Industrie  
des Produits Phytosanitaires



Denmark  
DCPA – Danish Crop  
Protection Association



France  
UIPP – Union des Industries  
de la Protection des Plantes



Germany  
IVA – Industrieverband  
Agrar eV



Greece  
HCPA – Hellenic Crop  
Protection Association



Ireland  
APHA – Animal and Plant  
Health Association



Italy  
Agrofarma – Associazione  
nazionale imprese agrofarmaci



Netherlands  
Nefyto – Dutch Crop  
Protection Association



Spain  
aepla – Asociación Empresarial  
para la Protección de las Plantas



United Kingdom  
CPA – Crop Protection  
Association

## Group of Nordic Country Associations, Constituting One Member Only



Finland  
**KASTE**  
Kasvinsuojeluteollisuus ry



Norway  
**NPF** – Norsk Plantevern Forening



Sweden  
**Svenskt Växtskydd**

## National Associations as Associate Members



Bulgaria  
**BgCPA** – Bulgarian Crop Protection Association NA



Croatia  
**CROCPA** – Croatian Crop Protection Association



Cyprus  
**CCPA** – Cyprus Crop Protection Association



Czech Republic  
**CCPA** – Czech Crop Protection Association



Hungary  
**HuCPA** – Hungarian Crop Protection Association



Latvia  
**LAARUTA** – Latvian Crop Protection Association



Lithuania  
**LCPA** – Lithuanian Crop Protection Association



Poland  
**PSOR** – Polskie Stowarzyszenie Ochrony Roślin



Portugal  
**ANIPLA** – Associação Nacional da Indústria para a Protecção das Plantas



Romania  
**AIPROM** – Romanian Crop Protection Association



Russia  
**AEB** – Russian Federation



Serbia  
**SECPA** – Serbian Crop Protection Association



Slovak Republic  
**SCPPA** – Slovak Crop Protection Association



Slovenia  
**SLOCPA** – Slovenian Crop Protection Association



Switzerland  
**scienceINDUSTRIES** Business Association  
Chemistry Pharma Biotech



Turkey  
**ZIMID** – Ziraat Mücadele İlaçları Üreticileri Derneği

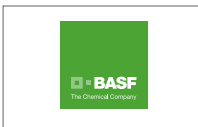


Ukraine  
**EBA** – European Business Assoc. Agrochemical Committee



Kazakhstan  
The Kazakhstan Plant Protection Association

## GAPEG Member Companies (non-agriculture)



BASF



Bayer Environmental Science



COMPO



Everris



Monsanto Europe



Neudorff



Nufarm



Scotts France



Syngenta

## GAPEG Member Associations (non-agriculture)



Spain  
**aepla**  
Asociación Empresarial para la Protección de las Plantas



Belgium  
**Phytofar** – Belgische Vereniging voor de Industrie van Phytosanitaire Producten  
Association Belge de l'Industrie des Produits Phytosanitaire



Italy  
**Agrofarma**  
Associazione nazionale imprese agrofarmaci



France  
**UPJ** – Union des entreprises pour la Protection des Jardins et Espaces Verts



## European Crop Protection

The European Crop Protection Association (ECPA) represents the crop protection industry at the European level. Its members include all major crop protection companies and national associations across Europe.

ECPA promotes modern agricultural technology in the context of sustainable development; to protect the health of humans and the environment, and to contribute towards an affordable healthy diet, competitive agriculture and a high quality of life.

ECPA members support fair, science-based regulation as a guarantee to the consumer, and the crop protection user, of high standards and safe products.

For more information, please contact:

**ECPA aisbl**

6 Avenue E. Van Nieuwenhuyse

1160 Brussels - Belgium

Tel: +32 2 663 15 50

Fax: +32 2 663 15 60

E-mail: [ecpa@ecpa.eu](mailto:ecpa@ecpa.eu)

[www.ecpa.eu](http://www.ecpa.eu)

[www.twitter.com/cropprotection](https://www.twitter.com/cropprotection)

[www.facebook.com/cropprotection](https://www.facebook.com/cropprotection)

May 2014