

The University of Hertfordshire Agricultural Substances Databases - Glossary of Terms

The present document aims to providing basic information on the terms used within the PPDB, BPDB and the VSDB. Additional information may be found in a 'Background and Support information' document available on the database websites as a PDF download. On these websites you will also find various other support documents and our 'Terms and Conditions of Use'.

A

Abiotic degradation	Degradation of a chemical via physical or chemical mechanisms such as hydrolysis and photolysis.
Absorption	Movement of a chemical from the environment across a biological membrane into an organism.
Acaricide	A class of pesticide that kills or controls mites and ticks – also known as a miticide.
Acceptable Daily Intake (ADI)	The estimated amount of a chemical in food and drinking water that can be ingested daily during a lifetime without appreciable health risk. Usually expressed as mg/kg bodyweight.
Accumulation	The build-up of a chemical in an organism or environmental compartment.
Acetylcholinesterase (AChE)	An enzyme, present in nerve tissue, muscles and blood cells, that catalyses the hydrolysis of acetylcholine and acetic acid allowing neural transmission.
Acetylcholinesterase inhibitor	A substance (e.g. organophosphate) that blocks the action of the enzyme acetylcholinesterase and so causes disruption of neural transmission.
Active substance	The substance within a chemical product formulation that causes the desired biological effect. Also known as the active substance.
Acute effect	An adverse effect on any living organism in which severe symptoms develop rapidly and often subside after the exposure stops.
Acute toxicity	Ability of a substance to cause adverse effects within a short period after dosing or exposure.
Adjuvant	Substance designed to enhance the activity or other property of a pesticide mixture.
Adsorption	Enrichment of one or more components in an interfacial layer.
Adsorption Coefficient (K_{oc}, K_{foc})	Chemicals vary in how well they are adsorbed to soil particles. K_{oc} / K_{foc} measures the affinity for pesticides to sorb to organic carbon. The higher the value, the stronger the tendency to attach to and move with soil. Usually expressed as mL/g or L/Kg. In the PPDB data is given for K_d , K_{oc} as well as Freundlich Isotherm data K_f , K_{foc} and $1/n$.
Aerobic	Living or occurring only in the presence of oxygen.
Ambient	Environmental or surrounding conditions.
Anaerobic	Living or occurring only in the absence of oxygen.

Acceptable Operator Exposure Level (AOEL)	A health-based limit that is established on the basis of the full toxicological assessment required for regulatory control. The risk for operators can be quantified by comparing this value with exposure level during pesticide application.
Acute Acceptable Operator Exposure Level (AAOEL)	A health-based limit that is established on the basis of the full toxicological assessment required for regulatory control. The acute risk for operators can be quantified by comparing this value with exposure level during pesticide application.
ANSI	American National Standards Institute.
Aqueous	Pertaining to water.
Aquifer	Water-bearing layer of rock (including gravel and sand) that will yield water in usable quantity to a well or spring.
Acute Reference Dose (ARfD)	The amount of chemical that can be ingested over a short period of time, usually during one meal or one day, without appreciable health risk to the consumer - as far as evidence suggests.
Avicide	A class of pesticides that is used to kill or control birds.

B

Bioaccumulation	Progressive increase in the amount of a substance in an organism or part of an organism which occurs because the rate of intake exceeds the organisms ability to remove the pesticide from the body. Also known as biomagnification.
Bioconcentration	Process leading to a higher concentration of a chemical in an organism than in environmental media to which it is exposed.
Bioconcentration Factor (BCF)	Ratio between the concentration of chemical in an organism or tissue and the concentration in the environmental matrix (usually water) at apparent equilibrium during the uptake phase.
Bioavailability	Extent to which a chemical residue can be taken up into an organism from its food and environment, and the rate at which this occurs.
Biodegradation	Conversion or breakdown of the chemical structure of a chemical catalysed by enzymes, resulting in loss of biological activity.
Biomass	The total living mass in a defined segment of an ecosystem expressed as the living weight per unit area or mass.
Biopesticide	Pesticide of biological or natural origin including micro-organisms e.g. <i>Bacillus thuringiensis</i> and natural products e.g. rotenone, pyrethrins.
Biotransformation	Conversion of the chemical structure of a chemical in to one or more products by a biological mechanism such as enzyme action.
Bodyweight (BW)	Weight per unit of an organism. Metrics depend on the organism and may be kg, g or µg.
Bound residue	A chemical residue that is bound to soil and cannot easily be extracted by solvents.
Breakdown	Process by which the chemical breaks down into smaller molecules.
Broad spectrum pesticide	A pesticide that kills a wide range of pest species as opposed to one that kills a single species or limited range.

C

Candidate for Substitution (CfS)	Used in regulatory processes - an active substance is a 'CfS' if it has certain hazardous properties (e.g. it is carcinogenic, a reproduction toxin or an endocrine disrupter). The aim is to gradually replace these substances with newer, safer alternatives.
Carcinogen	A substance capable of causing or inducing cancer.
Carcinogenicity	Ability of a substance to produce or induce cancer.
Carrier	A substance added to a pesticide formulation that acts as an absorbent or diluent.
CAS RN	Chemical Abstracts Service Registry Number. A unique chemical identifier.
Central Nervous System (CNS)	Part of the animal nervous system that is comprised of the brain and spinal cord.
Cholinesterase (ChE)	An enzyme required for nerve function.
Chronic effect	A consequence of chemical exposure that arises slowly and which is long-lasting and irreversible.
Chronic toxicity	Capacity of a chemical to cause harm following chronic exposure or to produce effects that are persistent.
CIPAC	Collaborative International Pesticides Analytical Council Limited
CIPAC code	A unique reference number used to provide unambiguous identification of pesticide active substances.
Common moiety	A molecular sub-unit which is common to the structures of several pesticides or metabolites.
Common name	General name given to a chemical by an established and recognised organisation such as ANSI, ISO, WSSA.
Compartment	Part of an organism or ecosystem that could be considered as independent for the purposes of chemical effects or dissipation.
Contaminant	An impurity or unintended substance.
COPR	Refers to the GB Control of Pesticides Regulation
Critical load	Amount of chemical pollutant leading to a critical concentration in an environmental compartment.
Cumulative effect	Overall (additive) adverse change which occurs following repeated doses of a chemical.

D

Decomposition	Process by which the chemical divides into smaller molecular structures.
Degradate	Chemical substance that results from decomposition. Also known as a metabolite or breakdown product.
Degradation	Process by which the chemical breaks down into smaller molecular structures.
Degradation rate (DT50, DT90)	The rate of pesticide degradation in or on the reference media (soil, air, water, foliage). It is expressed as the time in days taken for 50% (DT50) or 90% (DT90) of the pesticide to disappear.
Dermal	Of the skin or through the skin.
Desorption	Depletion of one or more components in an interfacial layer.
Dispersible granule	Granules that readily disperse in water to form a suspension.

Dissociation constant (pKa)	Strengths of acids and bases can be indicated on a common scale at 25°C. Defined as the negative logarithm of the acidity constant Ka. The lower the pKa the stronger the acid.
Dose	A measure of exposure.
Dose effect relationship	Relationship between the dose of the chemical to which the organism is exposed and the magnitude of the biological effect.
Dose response relationship	Relationship between the dose of the chemical and the incidence frequency of a biological effect in the exposed population.
Dusting powder	A fine, free-flowing powder formulation that can be dusted.

E

EEA	European Economic Area (EU member states plus Iceland, Liechtenstein and Norway) which identified countries which are part of the EU's Single Market.
Effect Concentration (EC₅₀)	Chemical concentration expected to produce a certain effect (mortality, decreased reproduction etc) in 50% of the test population.
Effective Rate (ER₅₀)	The applied dose at which 50% effect is observed in the study population.
EINECS / ELINKS / EC number	The unique reference number for the chemical in the European Chemical Substances Information System (EINECS or EU number) or European List of Notified Chemicals (ELINCS).
Emulsifiable concentrate	Liquid formulation containing emulsifiers in an organic solvent that disperse when added to water.
Emulsifier	Surfactant used to aid the preparation of a colloidal dispersion of one liquid in another with which it is not miscible.
Endpoint	Measurable ecological or toxicological characteristic or parameter of the test system that is chosen as the most relevant assessment criterion (e.g. mortality or effect incidence).
Environmental fate	The destiny of the chemical after release into the environment.
Estimated Daily Intake (EDI)	Prediction of the daily intake of a chemical residue, based on a realistic estimation of residues in food items and consumption data for a specific population.
Estimated Maximum Daily Intake (EMDI)	Prediction of the maximum daily intake of a chemical residue, based on a maximum estimation of residues in food items and consumption data for a specific population.
Exposure	Contact with a pesticide or other chemical.

F

FAO	Food and Agriculture Organization of the United Nations
Flash point	The lowest temperature at which a liquid gives off ignitable vapours.
Flowable	Chemical product formulation in which the active substance is in the form of a stable dispersion of fine particles in a liquid.
Formulant	Any substance added to chemical product formulation other than the biologically active material.

FRAC	Fungicide Resistance Action Committee
Fresh weight	The 'as received weight' with no allowance for moisture content.
Freundlich Isotherm	Empirical relationship describing the adsorption of a solute from a liquid or gas to a solid in which the quantity of material per unit mass of absorbent is expressed as a function of the equilibrium concentration of the sorbate.
Fumigant	Pesticide or other chemical used in the gas or vapour form.
Fungicide	A class of pesticides used to kill or control fungi, especially those that cause plant diseases.

G

GAP	Good Agricultural Practice
Genotoxicity	Ability of a chemical to cause damage to the structure or function of genetic material.
Granule	Solid formulation where particles are of a uniform size.
Groundwater	Water present in the saturated subsurface zone of the soil profile where all free space in the rock and sediments are flooded with water.
Groundwater Ubiquity Score (GUS)	An experimentally calculated value that relates pesticide half-life and Koc/Kfoc. As an indicator it may be used to judge the potential of a pesticide active substance to move toward groundwater.

H

Half-life (DT₅₀)	The time taken for the concentration of the chemical in a defined compartment (e.g. soil, water, air, plant) to decline by 50%.
Hazard	An inherent property of the chemical that gives it the potential to cause adverse effects on man, fauna, flora or the environment.
Henry's Law Constant	A Gas Law states that the amount of gas absorbed by a given volume of liquid at a given temperature is directly proportional to the partial pressure of that gas in equilibrium with that liquid. As such it provides an indication of the preference of a chemical for air relative to water i.e. its volatility. Henry's Law Constant is usually quoted in Pa.m ³ /mol or in a dimensionless form at 20°C.
Herbicide	A class of pesticides used to kill or control plant growth – a weed or grass killer.
HRAC	Herbicide Resistance Action Committee
Hydrolysis	The chemical process of decomposition involving the cleaving of a molecule and the insertion of a water molecule.

I

Inert substance	A substance in the chemical product formulation that does not have specific activity against the pest or disease but which is added to enhance the effectiveness of the chemical such as a solvent or carrier.
Inhalation	Drawing of air into the lungs.
Insecticide	Class of pesticide used to kill or control insects.
Isomerism	The existence of more than one substance having a given molecular composition and molar mass but differs in constitution or structure. Different identifies are called isomers.
InChI	IUPAC International Chemical Identifier. A textual descriptor of a chemical substance.
InChIkey	A 27 character code used for identifying a chemical. It is related to InChI.
Intake	Amount of chemical inhaled, ingested or absorbed by the skin during a specified time period.
<i>In vitro</i>	'In-glass' referring to the reference data being derived from laboratory studies.
<i>In vivo</i>	Use of the living organism in studies.
IRAC	Insecticide Resistance Action Committee.
Irritant	Any substance that can cause an irritation to the skin, eyes, or respiratory system.
ISO	International Organization for Standardization.
IUPAC	International Union of Pure and Applied Chemistry.

K

K_{oc}, K_{foc}	Chemicals vary in how well they are adsorbed to soil particles. K _{oc} / K _{foc} measures the affinity for pesticides to sorb to organic carbon. The higher the value, the stronger the tendency to attach to and move with soil.
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L

Larvicide	A class of pesticides used to kill or control insect larvae.
Local Environment Risk Assessment for Pesticides (LERAPs)	A LERAP is used to determine if pesticide sprayer operators can reduce the spray buffer zone. It considers the active substance properties, dose rate, width of water course and the spray nozzle to be used.
Lethal concentration (LC₅₀)	Concentration of a chemical required to kill half of the test population.
Lethal dose (LD₅₀)	Dose of a chemical required to kill half of the test population.
LDD50	See Median Lethal Dietary Dose
Leaching	Process by which a chemical moves through the soil profile to the aqueous phase.
Limit of Detection	Lowest concentration of a chemical residue in a defined matrix which can be positively identified via a specific method.
Lipophilicity	Affinity of a chemical compound to dissolve in fats, oils, lipids, and non-polar solvents such as hexane or toluene rather than water.

Log P	The partition coefficient of a substance between n-octanol and water, often used in the Logarithm base 10 form (log P) as an indicator that a substance may bioaccumulate.
Lowest Observed Adverse Effect Level (LOAEL)	The lowest dose in a toxicity study resulting in adverse health effects.

M

Macropore	Soil pore larger than 1mm diameter including voids caused by earthworms, mammals, root channels and soil cracks.
Maximum Contaminant Level (MCL)	The maximum level of certain contaminants permitted in drinking water supplied by a public water system as set by EPA under the federal Safe Drinking Water Act.
Maximum Residue Limit (MRL)	Maximum concentration of a residue legally permitted or recognised as acceptable in food, agricultural commodities or animal feedstuffs. mg/kg fresh weight.
Median Effect Concentration (EC₅₀)	Chemical concentration expected to produce a certain effect (mortality, decreased reproduction etc) in 50% of the test population.
Median Lethal Concentration (LC₅₀)	Concentration of a chemical required to kill 50% of the test population.
Median Lethal Dose (LD₅₀)	Dose of a chemical required to kill 50% of the test population.
Median Lethal Dietary Dose (LDD₅₀)	The dietary dose of a substance that can cause death in 50 % of the test population at the end of the test period.
Melting point	The temperature at which a substance changes its physical state from a solid to a liquid.
Mesocosm	Man made model ecosystem containing associated organisms and abiotic components that is large enough to be representative of a natural system but small enough to be used in controlled experiments.
Metabolite	An intermediate substance resulting from the breakdown of a chemical. Also known as a degradate or breakdown product.
Mineralisation	Conversion of a chemical from an organic form to an inorganic form, usually via microbial degradation.
Miticide	A class of pesticides that kill or control mites and ticks – also known as an acaricide.
Molluscicide	A class of pesticides that kill or control molluscs – primarily slugs and snails.
Mutagenicity	Ability of a chemical to produce a detectable and heritable change in genetic material which may be transmitted to the offspring of infected persons through germ cells or from one cell generation to another.
Mutation	An alteration in the genetic structure which may be passed from one generation to another.

N

Nematicide	A class of pesticide used to kill or control nematodes.
Neurotoxin	A chemical that can destroy or damage nerve tissue.
No Observed Effect Concentration (NOEC)	Highest concentration of a chemical in the test system that causes no observable biological effect to the target organism.
No Observed Effect Level (NOEL)	Highest concentration of a chemical in the test system that causes no observable biological effect to the target organism.
No Observed Ecologically Adverse Effect Concentration (NOEAEC)	The concentration at or below which no long-lasting adverse effects were observed in a particular higher-tier study (e.g. mesocosm).
Non-systemic	Not capable of affecting an entire system, limited to a particular areas of a plant or animal.
NR-Leth	Concentration of a chemical that will kill all of the tested population (e.g. 100% mortality or 10% survival) and for which no statistically derived endpoint reported.
NR-Zero	Concentration of a chemical that will not kill any of the tested population (e.g. 0% mortality or 100% survival) and for which no statistically derived endpoint reported.

O

Oncogenicity	The ability of a chemical or other substance to produce benign or malignant tumours.
Organic-Carbon Sorption Coefficient (K_{oc})	Chemicals vary in how well they are adsorbed to soil particles. K_{oc} / K_{foc} measures the affinity for pesticides to sorb to organic carbon. The higher the value, the stronger the tendency to attach to and move with soil.
Organochlorine (OC)	Generic term for an organic pesticide containing chlorine.
Organic matter (OM)	Soil particles created by the decomposition of plant or animal tissue.
Octanol/Water Partition Coefficient (K_{ow})	The partition coefficient of a substance between n-octanol and water, used as the Logarithm base 10 form, as an indicator that a substance may bioaccumulate.
Organochlorine (OC)	Generic term for an organic pesticide containing chlorine
Organohalide	Generic term for an organic pesticide containing a halide molecule (P, Cl, I)
Organophosphate (OP)	Generic term for an organic pesticide containing phosphorus.

P

Partition coefficient (P/Log P)	Ratio of the concentrations of a substance in solution in two phases which are in equilibrium. Often expressed as the Log10 value.
Predicted Environmental Concentration (PEC)	An indication of the expected concentration of a chemical in an environmental compartment, taking into account the amount initially present (or added to) the environment, its distribution, and the probable methods and rates of environmental degradation and removal, either forced or natural.

Pellet	A small, solid or densely packed ball or mass of chemical product formulation.
Permissible Exposure Limit (PEL)	Workplace exposure limits for contaminants established by OSHA.
Persistence	Environmental persistence refers to the length of time a substance resides in environmental media and is usually defined in terms of half-life or residence time.
Pest	Any organism that damages crops, plants or injures or irritates livestock or man.
Pesticide	Any chemical substance used for killing or controlling pests such as insects, weeds, fungi, mammals, birds etc.
Pesticide Chemical Code (PC Code)	A six-digit number assigned by the US EPA to identify pesticide chemicals. Also called a Shaughnessy code and is often used for searching computer databases because it is short and easy to enter.
Pesticide common name	A simple name assigned to a pesticide active substance by a recognised body such as ISO.
Pesticide formulation	The form a pesticide product takes such as water dispersible granules, emulsifiable concentrate, tablets, oil dispersions or ready-to-use baits.
Pesticide residue	The small amounts of a pesticide that may remain on or in food following an application and harvest.
pH	An indication of the acidity or alkalinity of a substance on a scale of 0-14. pH values below 7 indicate acid conditions, those above 7 indicate alkaline conditions.
Pheromone	A substance used to disrupt the mating behaviour of insects.
Photolysis	Chemical reaction caused by light in which a chemical bond is cleaved.
Preferred Identification Name (PIN)	A chemical name that is preferred by IUPAC when there is more than one IUPAC chemical name.
pKa	The Dissociation Constant. Strengths of acids and bases can be indicated on a common scale at 25°C. Defined as the negative logarithm of the acidity constant Ka. The lower the pKa the stronger the acid.
Post-emergence	Period after a crop or pest has appeared.
Personal protective clothing (PPC)	Recommended clothing, such as gloves, gowns, shoe covers, head covers, masks, eye protection, face shields, and goggles, used to protect operators from pesticide exposure.
Personal protective equipment (PPE)	Recommended equipment, including PPE and other items such as respirators, used to protect operators from pesticide exposure.
Preferential flow	Leaching phenomenon whereby water and a dissolved chemical percolating down through the soil profile move quicker through soil macropores or sand/gravel than through the network of small pores in the bulk soil.
PubChem CID	A unique identifier used to locate a chemical in the US PubChem open chemistry database delivered by the US National Institutes of Health (NIH).

R

Reference dose	Expected dose resulting from human exposure to a chemical at the level at which it is regulated in the environment.
Registration	The legal process whereby the responsible governmental authority approves the sale and use of a pesticide following scientific evaluation regarding its effectiveness and safety.
Repellent	Any chemical that can be used to drive away insects, birds, cats, dogs or other pests.
Reproductive effects	Changes which may occur during the reproductive process such as mutagenesis, diminished fertility and growth retardation including damage to or early death of offspring
Resistance	Development of a tolerance to a pesticide by a target population, generally through natural selection.
Rodenticide	A class of pesticide which kills or controls rodents especially rats and mice.

S

Safener	A substance added to a pesticide formulation to eliminate or reduce phytotoxic effects of the pesticide to certain crops.
Safety Factor (SF)	Provision of an extra margin to allow for uncertainties.
SCI-GROW	SCI-GROW is a screening model which the Office of Pesticide Programs (OPP) in US EPA have used to estimate pesticide concentrations in vulnerable ground water.
Selectivity	A difference in the toxicity of a pesticide between different species, sexes, strains or age groups.
Semiochemical	A chemical produced by one species, or a synthetic analogue of that chemical, that evokes a behavioural response in another species. Three classes of semiochemicals include pheromones, allomones and kairomones.
Sensitisation	The development of a hypersensitive or allergic reaction upon re-exposure to a substance.
Shaughnessy Code	A six-digit number assigned by the US EPA to identify pesticide chemicals. Also called the Pesticide Chemical Code and is often used for searching computer databases because it is short and easy to enter.
SMILES	The 'Simplified Molecular Input Line Entry System' which is used to translate a chemical's three-dimensional structure into a string of symbols that is easily understood by computer software.
Soil mobility	Movement of a chemical through soil from the area being treated by leaching, volatilisation, adsorption, desorption or dispersal with water.
Sorption	Removal of a chemical from solution by soil or sediment via mechanisms of adsorption and absorption.
Short-Term Exposure Limit (STEL)	Maximum allowable concentration not to be exceeded during a 15 min exposure period up to 4 times a day. The level to which a person may be exposed without suffering adverse effects.
Sticker	Substance added to pesticide formulations that increases the adhesiveness of the pesticide

Surfactant	Substance used to reduce the interfacial tension of two boundary surfaces thereby increasing the emulsifying, spreading and wetting properties of liquids or solids.
Suspension concentrate	Chemical product formulations in which the active substance is in the form of a stable dispersion of fine particles in a liquid.
Systemic	Affecting or distributed throughout the whole body

T

Teratogenic	The ability to produce birth defects.
Threshold	The lowest dose of a chemical at which a specified measurable effect is observed.
Tolerable Daily Intake	An estimate of the amount of a chemical in air, food or drinking water that can be taken in daily over a lifetime without appreciable health risk.
Translocation	Transport of a substance throughout a plant from the site of absorption
Transpiration	The process in plants by which water is taken up by the roots and released as water vapour by the leaves

U

United Nations (UN)	An international organisation founded in 1945. Currently made up of 193 Member States.
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V

Vapour pressure	A relative measure of the volatility of a chemical in its pure state. The pressure exerted by a gas that is in equilibrium with its solid or liquid form.
Volatile Organic Compounds (VOC)	Any organic compound which evaporates readily to the atmosphere. VOCs contribute significantly to photochemical smog production and certain health problems.

W

Water dispersible granule	A type of chemical product formulation that consists of granules that readily disperses in water to form a suspension.
Water dispersible powder	A type of chemical product formulation that consists of a powder that readily disperses in water to form a suspension.
Wettable powder	A type of chemical product formulation that consists of a powder that readily disperses in water to form a suspension.
Wetting agent	A substance that lowers the surface tension of a liquid, allowing easier spreading. It may also lower the interfacial tension between two liquids.
WHO	World Health Organisation.
WSSA	Weed Science Society of America.