

INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY
CHEMISTRY AND THE ENVIRONMENT DIVISION¹

GLOSSARY OF TERMS RELATING TO PESTICIDES
(IUPAC Recommendations 2006)

Prepared for publication by

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5 **Glossary of terms relating to pesticides**
6
7 **(IUPAC Recommendations 2006)**
8

9 *Abstract.* The glossary contains definitions of more than 500 terms frequently used in relation
10 to the chemistry, mode of action, regulation and use of pesticides. A wide range of
11 disciplines are involved in this field and the glossary was developed as a step in facilitating
12 communication between researchers, government regulatory authorities and chemists in
13 associated professional areas. The range of terms relates to pesticide residue analysis,
14 sampling for analysis, good laboratory practice, metabolism, environmental fate, effects on
15 ecosystems, computer simulation models, toxicology and risk assessment. The number of
16 important, 'pesticide related' terms has more than doubled since 1996, when the first IUPAC
17 glossary of this type was developed [1], an indication of how this field has become so
18 integrated with many other scientific and regulatory disciplines.

19
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29 **PREFACE**

30
31 Pesticides are a broad class of bioactive compounds important for food and crop production
32 and for human health. The development, production, use and regulation of pesticides
33 encompasses a very wide range of disciplines including synthetic chemistry, chemistry of
34 formulations and residues, biological and environmental fate, soil and plant science,
35 toxicology, ecotoxicology, and risk assessment. Biotechnology, good laboratory practice, and
36 computer simulation modelling are also very important to this field. There is a high degree of
37 activity from national government authorities and from international organisations.
38 Educational institutions, media for mass communication, non-governmental organisations
39 (e.g., consumer associations, environmental groups) and the general public are also
40 concerned with the complex issues surrounding pesticides. The need for good
41 communication between all the groups involved with, or interested in, pesticides is obvious.
42 This IUPAC project develops a new glossary on pesticide nomenclature, terminology and
43 definitions which will also be published electronically to assist in this process. It is an update
44 of an earlier IUPAC glossary of terms related to pesticides that was published in 1996 [1].
45

46 The glossary has drawn on a wide variety of sources. Some general definitions have been
47 put into a pesticide context but in all cases the aim has been to preserve the core meaning.
48 Definitions for a number of formulation terms are inconsistent between different authorities
49 and we have largely followed those of FAO. The definitions and recommended abbreviations
50 for the most commonly used formulations of pesticides are provided. The full list of over 60
51 formulation types defined by GIFAP [2] is available. The modes of action for a few fungicides,

1
2
3
4 insecticides and herbicides are presented, as examples, but there is no intent to be all-
5 inclusive in this area. Furthermore, as research continues these mechanisms will be
6 understood more precisely. Whenever accurate and helpful, with respect to pesticides,
7 definitions of terms in the online version of the IUPAC, 1997 Compendium of Chemical
8 Terminology [3] is used as the preferred definitions. Toxicology definitions are also consistent
9 with those recommended by the IUPAC Commission on Toxicology in their very
10 comprehensive glossary (4). Explanation has been kept to a minimum because of the
11 difficulty in giving adequate expansions of meaning within a limited space. Terms related to
12 pesticide risk assessment are consistent with those developed by OECD and IPCS to
13 advance their efforts for international harmonization and understanding in that field. Widely
14 used abbreviations are given in the body of the glossary and can be readily found through the
15 alphabetically ordered definitions or via cross references. A separate list of national or
16 international bodies with direct relevance to pesticides is provided.
17

18 This project demonstrates a long-term commitment by IUPAC to the periodical
19 updating glossaries by the incorporating user as well as expert feedback. This
20 publication ensures transparency and is an important quality control mechanism.
21 The Web-based INFOCRIS version provides a transition mechanism and means to
22 gauge client use. In addition, extensible mark-up language procedures encourage
23 reuse of the glossary by other information systems. See the FAO/IAEA website for an
24 example [5].
25

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27
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38 continuing efforts of these many participants from so many different disciplines, this glossary
39 could not have been possible.
40

41 **ALPHABETICAL ENTRIES**

42 43 **(1) abiotic**

44 Not associated with living organisms.
45 [3]
46

47 **(2)abiotic degradation**

48 *Degradation* of a pesticide via purely physical or chemical mechanisms. Examples include
49 *hydrolysis* and *photolysis*.
50

51 **(3)absorption**

52 1. *Penetration* of a *pesticide* into an organism by various processes, some specialized, some
53

1
2
3
4 involving expenditure of energy (active transport), some involving a *carrier* system, and
5 others involving passive movement down an electrochemical or concentration gradient: In
6 mammals, *absorption* is usually through the respiratory tract, or skin

7 After [6]

- 8 2. The process of one material (absorbent) being retained by another (absorbate); this may be
9 the physical solution of a gas, liquid, or dissolved substance to a solid surface by physical
10 forces, etc.

11
12 **(4)Acaricide**

13 *Pesticide* used for the control of ticks or mites.

14
15 **(5)Accelerated degradation**

16 See enhanced degradation.

17
18 **(6)acceptable daily intake (ADI)**

19 Estimated maximum amount of an agent or pesticide, expressed on a body mass basis, to
20 which an individual in a (sub) population may be exposed daily over its lifetime without
21 appreciable health risk.

22 [7]

23 See also *Reference Dose (RfD)*

24
25 **(7)accumulation**

26 See *bioaccumulation*.

27
28 **(8)accuracy (of measurement)**

29 Closeness of agreement between the result of a measurement and the (conventional) true
30 value of the measure.

31 [8]

32 *Note 1.* Use of the term *precision* for *accuracy* should be avoided.

33 *Note 2.* True value is an ideal concept and, in general, cannot be known exactly .

34
35 **(9)Acetolactate synthase (ALS) inhibitors**

36 Acetolactate synthase is the enzyme that catalyses the first step in the synthesis of leucine,
37 isoleucine and valine. Herbicidal inhibitors of this enzyme in plants include chlorimuron,
38 imazethapyr, diclosulam, pyribenzoxim, flucarbozone and related herbicides.

39 [9]

40 See also *glutamine synthetase (GS) inhibitors*

41
42 **(10)Acetyl CoA carboxylase (ACCase) inhibitors**

43 ACCase catalyses the first step in fatty acid biosynthesis. Fatty acids are the building blocks
44 for lipids, essential components in membranes of organisms. The ACCase inhibitors
45 specifically inhibit the multi-domain enzyme found in the Gramineae, affecting fatty acid
46 biosynthesis. Examples of herbicides with this mode of action include fenoxaprop-ethyl,
47 sethoxydim and related herbicides.

48 [9]

49
50 **(11)Acetylcholinesterase inhibitor**

51 Compounds which block the action of the enzyme, acetylcholinesterase, interfering with the
52 transmission of impulses between nerve cells in insects. Examples of insecticidal inhibitors of

1 this enzyme include carbamates (e.g. carbaryl andaldicarb) and organophosphates (e.g.
2 malathion and chlorpyrifos).

3 [10]

6 **(12) Acetylcholine, nicotinic receptor agonists**

7 Compounds that simulate acetyl choline and bind at its site on the post-synaptic nerve in
8 insects causing excitation, then paralysis and death.

9 [11]

10 *Note:* Example agonists include the chloronicotinyl compound, imidachloprid and the
11 thionicotinyl compound, thiamethoxan.

13 **(13) Acetylcholine receptor antagonists**

14 Compounds (e.g. cartap hydrochloride) that block the nicotinic receptor of acetylcholine
15 resulting in paralysis and death of the insects.

16 [11]

18 **(14) Acid equivalent (ae)**

19 1. For those pesticides that are acids, *acid equivalent*, abbreviated as *a.e.*, is the amount of
20 *active ingredient* expressed in terms of the parent acid.

21 2. The theoretical yield of parent acid from a pesticide active ingredient which has been
22 formulated as a derivative

23 [12]

25 **(15) Acropetal**

26 Toward the apex of a plant organ, generally upward in shoots and downward in roots.

27 [12]

29 **(16) action level (regulatory)**

30 1. For food commodities, an administrative *maximum residue limit* (MRL) used by regulatory
31 authorities to initiate action where no legally defined MRL has been established.

32 2. For the environment, concentration of a pesticide in air, soil or water at which emergency
33 measures or preventative actions are to be taken

34 After [4]

36 **(17) action limits (analytical quality control)**

37 Limits for measurements on *reference material* or *spiked samples* which indicate when an
38 analytical procedure is not performing adequately and requires immediate action before data
39 can be reported.

41 **(18) active ingredient (ai)**

42 1. The component(s) of a pesticide formulation responsible for the direct or indirect *biological*
43 *activity* against pests and diseases, or in regulating metabolism/growth, etc. A single
44 *active*

45 *ingredient* may be comprised of one or more chemical or biological entities which may
46 differ in relative activity. A formulation may contain one or more *active ingredients*.

47 [13]

48 2. The ingredient(s) of a control product to which the effects of the pest control product are
49 attributed, including synergists but not solvents, diluents, emulsifiers or components that
50 by themselves are not primarily responsible for the effects of the product.

51 [14]

53 **(19) Activation**

1 1. Processes of chemical modification that make a pesticide more toxic

2 [12]

3 2. Process by which a pesticide that is applied to the soil surface is moved into the soil
4 where

5 it can be absorbed by weed seedling or insect pests, normally as a result of rainfall,

6
7
8
9 irrigation, or tillage but not necessarily chemical modification

10 After [14]

11
12 **(20)Active transport**

13 Energy-expending mechanism by which a cell moves a chemical across a cell membrane
14 from
15 a point of lower concentration to a point of higher concentration against a concentration
16 gradient.

17
18 **(21)acute exposure**

19 Contact between a pesticide and a target occurring over a short time (e.g. less than a day).

20 [15]

21
22 **(22)acute reference dose (ARfD)**

23 Estimate of the amount of a substance in food and/or drinking water, normally expressed on a
24 body weight basis, that can be ingested in a period of 24 hours or less without appreciable
25 health risk to the consumer on the basis of all known facts at the time of the evaluation.

26 [16]

27
28 **(23)acute toxicity**

29 Adverse effects of finite duration occurring within a short time (up to 14 d) after administration
30 of a single dose (or exposure to a given concentration) of a pesticide or test substance or after
31 multiple doses (exposures), usually within 24 h of a starting point (which may be exposure to
32 the toxicant, or loss of reserve capacity, or developmental change, etc.

33 After [6]

34
35 **(24)additive effect**

36 Consequence that follows exposure to two or more pesticides or agents which act jointly but
37 do not interact: the total effect is the simple sum of the effects of separate exposure to the
38 agents under the same conditions.

39 After [6]

40
41 **(25)adjuvant**

42 Substance added to a pesticide formulation or to the spray tank to modify pesticide activity or
43 application characteristics

44 After [12]

45
46 **(26)adsorption**

47 Increase in the concentration of a substance (e.g. pesticide) at the interface of a condensed
48 (soil colloidal clay and/or organic matter) and a liquid or a gaseous layer owing to the
49 operation

50 of surface forces.

51 After [3]

52 Antonym: *desorption*

53

- 1 **(27)adverse effect**
2 Change in the morphology, physiology, growth, development, reproduction or life span of an
3 organism, system, or (sub) population that results in impairment of the capacity to
4 compensate
5 for additional stress, or an increase in susceptibility to other influences.
6 [7]
7
- 8 **(28)aerobic**
9 1. Requiring molecular oxygen.
10 [3]
11
12
13 2. Conditions under which molecular oxygen serves as the terminal electron acceptor in
14 respiration or in metabolic oxygenation.
15 See also *redox potential*
16
- 17 **(29)aerosol**
18 Fine solid or liquid particles created during pesticide spraying by shearing of the carrier
19 (usually water or oil) after forcing it under pressure through a small orifice. *Aerosol* cans using
20 an inert compressed propellant are a common means of dispensing insecticides for domestic
21 use.
22 See also *nebulisation*.
23
- 24 **(30)AFID** Alkali flame-ionisation detector or detection for gas chromatography (cf. NPD and
25 TID).
26
- 27 **(31)aged residue**
28 Residues of a pesticide or its degradates in soil that have diffused into intra-particulate
29 regions following application and have become less accessible to mass transfer and bio-
30 absorption processes, although still amenable to solvent extraction.
31
- 32 **(32)Aggregate exposure**
33 Sum total of all exposure to pesticides through inhalation, dermal, oral, or optic contact.
34
- 35 **(33)aggregate sample**
36 Sample made up of set proportions of other samples, typically an average by weight.
37 See also *composite sample*.
38
- 39 **(34)aglycon**
40 Non-sugar compound derived from the pesticide after replacement of the glycosyl group from
41 a glycoside by a hydrogen atom.
42 From [3]
43 See also, *exocon*.
44
- 45 **(35)agrochemical**
46 Agricultural chemical used in crop and food production including *pesticide*, feed additive,
47 chemical fertilizer, veterinary drug and related compounds.
48
- 49 **(36)Algaecide**
50 *Pesticide* used for the control of *algae*.
51
- 52 **(37)aliquot**
53 (in analytical chemistry). Known amount of a homogeneous material, assumed to be taken

1 with negligible *sampling error*.

2 *Note 1:* The term is usually applied to fluids.

3 *Note 2:* The term “aliquant” has been used when the fractional part is not an exact divisor
4 of the whole (e.g., a 15-ml portion is an aliquant of 100 ml).

5 *Note 3:* When an aliquot is taken of a laboratory sample or test sample or the sample is
6 otherwise subdivided, the samples have been called *split samples*

7 [6]

8
9
10 **(38) Allelopathy**

11 The adverse effect on the growth of plants or micro-organisms caused by the action of

12
13
14 chemicals produced by other living or decaying plants

15 [12]

16
17 **(39) anaerobic**

18 1. Not requiring molecular oxygen.

19 [3]

20 2. Condition under which reductive conditions prevail.

21 See also *redox potential*.

22
23 **(40) analytical portion** See *test portion*.

24
25 **(41) analytical range**

26 Measurement range of a test method where the performance has been validated and quality
27 standards such as *action limits* have been developed.

28
29 **(42) analytical sample** See *test sample*.

30
31 **(43) analytical standard**

32 Pesticide reference material of high and defined purity (generally >95% for preparation of
33 calibration standards.

34
35 **(44) anion**

36 A monoatomic or polyatomic species having one or more elementary (negative) charges of
37 the electron.

38 [3]

39
40 **(45) Antagonism**

41 Combined effect of two or more pesticides or factors, which is smaller than the solitary effect
42 of any one of those pesticides or factors. In bioassays, the term may be used when a
43 specified

44 effect is produced by exposure to either of two factors, but not by exposure to both together

45 [6]

46
47 **(46) antibody**

48 Protein (*immunoglobulin*) produced by the immune system of an organism in response to
49 exposure to a foreign molecule (*antigen*) and characterized by its specific binding to a site of
50 that molecule (antigenic determinant or *epitope*).

51 [3]

52
53 **(47) Antidote**

- 1 1. Substance used as a medical treatment to counteract pesticide poisoning.
2 2. Chemical or substance applied as a *protectant* to prevent the phytotoxic effect of a
3 specific herbicide on desirable plants

4 [12]

5 See also, *safener*.

6
7 **(48)Antifouling paints**

8 Products or coatings used to control aquatic fouling organisms, e.g., barnacles, mussels,
9 molluscs, and algae on ships, small boats, and other surfaces in freshwater or marine
10 environments

11 [14]

12
13
14
15
16 **(49)Apoplast**

17 Total non-living continuum in a plant, including cell walls, intracellular spaces, and the xylem
18 vessel, that forms a continuous permeable system through which water and solutes may
19 move.

20 [12]

21
22 **(50)Application rate**

23 Mass of pesticide active ingredient applied over a specific area or per unit volume of an
24 environmental component (air, water, soil)

25 After [12]

26
27 **(51)assay**

28 Set of operations having the object of determining the value of a quantity. In analytical
29 chemistry, this term is synonymous with measurement.

30 [3]

31
32 **(52)Assimilation**

33 Incorporation of materials acquired by the digestion of food or by photosynthesis into the body
34 of an organism. In plants and algae, the term is also applied to the absorption of light energy
35 and its utilization in internal chemical reactions

36 [17]

37
38 **(53)Attractant**

39 Chemical or substance intentionally used to attract insects or other pests for monitoring or
40 other purposes related to control (e.g., *pheromones*).

41
42 **(54)autoradiograph**

43 *Autoradiographs* of an object containing a radioactive substance (e.g. a radiolabelled
44 pesticide) are produced by placing the object (organism or tissue) adjacent to a photographic
45 plate or film or a fluorescent screen.

46 After [3]

47
48 **(55)Auxin hormone mimic**

49 Synthetic mimics of *auxin hormones* (e.g., indole acetic acid, IAA) that regulate growth and
50 differentiation in plants with their concentrations being regulated by synthesis, conjugation
51 and
52 degradation. Synthetic auxin herbicides such as phenoxy-carboxylic acids (e.g., 2,4-D,
53 MCPA),

1 benzoic acids (e.g., dicamba), pyridine carboxylic acids (e.g., clopyralid, picloram), and
2 quinoline carboxylic acids (e.g., quinclorac) can readily accumulate to phytotoxic levels in
3 plants.

4 After [9]

5
6 **(56)Avicide**

7 *Pesticide* used for the control of birds.

8
9 **(57) Bacillus thuringiensis (Bt)**

10 Gram-positive bacteria that produce proteinaceous, parasporal, crystalline inclusions during
11 sporulation. Suspensions of the living or dead bacterial cells can be applied as a biopesticide
12 to control, larval, leaf-feeding insects. Upon ingestion by insects, the crystalline inclusions are
13 solubilized in the mid-gut, releasing proteins. After activation by proteases in the mid-gut, the
14 protein endotoxins cause membrane disruption and leakage in the epithelium of the mid-gut
15 which leads to death of the insect.

16 [18]

17
18
19 *Note:* There are different subspecies of Bt that are uniquely active for the control of
20 different orders and species of insect pests.

21
22 **(58)Background level**

23 Amount of a pesticide in a medium (e.g., water, soil) that is not attributed to the source(s)
24 under investigation.

25 *Note:* *natural background level* is the concentration that occurs naturally or is not the result
26 of human activities.

27 [15]

28
29 **(59)Bactericide** See bacteriostatic agent.

30
31 **(60)Bacteriostatic agent**

32 Substance or *agent* that inhibits bacterial growth and multiplication. Similarly, other static
33 agents inhibit multiplication and growth of other specific groups of micro organisms.

34 [14]

35
36 **(61)bait**

37 Food, pheromone or other substance used to attract and expose a pest to a pesticide,
38 pathogen, or hormone for the purpose of control.

39
40 **(62)Band treatment**

41 Pesticide applied to a linear restricted strip on or along crop rows rather than continuous over
42 the field area.

43 [12]

44
45 **(63)Basipetal**

46 Toward the base of a plant organ: generally downward in shoots and upward in roots.

47 [12]

48
49 **(64)batch**

50 Quantity of material which is known or assumed to be produced under uniform conditions.

51 Some vocabularies assume 'lot' and 'batch' to be synonymous. The distinction made here
52 with

53 respect to knowledge of production history permits a lot to consist of one or more batches and

1 is useful in interpreting the results of analysis.

2 [3]

3
4 **(65)benthos**

5 Non-planktonic animals (not being suspended in water) associated with freshwater substrata
6 (upper layer of the sediment in rivers and ponds) at the sediment-water interface.

7 [19]

8
9 **(66)bioaccumulation**

10 Progressive increase in the amount of a substance in an organism or part of an organism
11 which occurs because the rate of intake exceeds the organism's ability to remove the
12 substance from the body.

13 [6]

14 See also *bioconcentration*.

15
16 **(67)bioactivation**

17 Metabolic conversion of a pesticide or other xenobiotic or agent within an organism to a more

18
19
20
21 toxic derivative.

22 [6]

23
24 **(68)bioassay**

25 Procedure for estimating the concentration or biological activity of a pesticide or agent by
26 measuring its effect on a living system compared to a standard system.

27 [6]

28
29 **(69)bioavailability**

30 Rate and extent to which a pesticide or metabolite can be absorbed by an organism and is
31 available for metabolism or interaction with biologically significant receptors. It involves both
32 release from a medium (if present) and absorption by an organism.

33 [15]

34
35 **(70)Biocidal products**

36 Active substances (or active ingredients) and preparations containing one or more active
37 substances, put up in the form in which they are supplied to destroy, deter, render harmless,
38 prevent the action of, or otherwise exert a controlling effect on any harmful organism by
39 chemical or biological means.

40 [20]

41
42 **(71)bioconcentration**

43 Uptake of a pesticide residue from an environmental matrix, usually through partitioning
44 across

45 body surfaces to a concentration in the organism that is usually higher than in the
46 environmental matrix.

47
48 **(72)bioconcentration factor (BCF)**

49 Ratio between the concentration of pesticide in an organism or tissue and the concentration
50 in

51 the environmental matrix (usually water) at apparent equilibrium during the uptake phase.

52 After [21]

1 **(73)Biocontrol**

2 Use of other organisms to reduce or suppress the population of a pest organism.

3
4 **(74)biodegradation**

5 Conversion or breakdown of the chemical structure of a pesticide catalysed by enzymes *in*
6 *vitro* or *in vivo*, often resulting in loss of biological activity.

7
8 **(75)biological assessment of exposure**

9 Assessment of exposure of a living organism to pesticides using biological specimens (blood,
10 urine etc.) taken in the environment (workplace, field etc.) with analysis either directly by
11 chemical determination of parent or metabolite, or indirectly by measurement of a relevant
12 biochemical parameter (e.g., plasma cholinesterase activity for organophosphorus,
13 compounds)

14 [4]

15
16 **(76)biological half-life**

17 For a substance, the time required for the amount of that substance in a biological system to
18 be reduced to one half of its value by biological processes, when the rate of removal is
19 approximately exponential.

20 [6]

21
22
23
24 **(77)biological indicator**

25 Species or group of species which is representative and typical for a specific status of an
26 ecosystem, which appears frequently enough to serve for monitoring and whose population
27 shows a sensitive response to changes, e.g., the appearance of a pesticide in the ecosystem.

28 [22]

29
30 **(78)biomagnification**

31 *Bioaccumulation* of a pesticide through an ecological food chain by transfer of residues from
32 the diet into body tissues. The tissue concentration increases at each trophic level in the food
33 web when there is efficient uptake and slow elimination.

34 [23]

35
36 **(79)biomarker**

37 Indicator signalling an event or condition in a biological system or *sample* and giving a
38 measure of *exposure*, effect, or susceptibility.

39 [6]

40 *Note:* Such an indicator may be a measurable chemical, biochemical, physiological,
41 behavioural, or other alteration within an organism.

42
43 **(80)biomass**

44 Material produced by the growth of microorganisms, plants or animals.

45 [3]

46
47 **(81)biometer flask**

48 Experimental apparatus commonly used in laboratory studies of pesticide degradation in soil.
49 Contains separate compartments for aerobic incubation of soil and for media to trap carbon
50 dioxide and volatile products.

51
52 **(82)biopesticide**

53 Biological agents with pesticidal activity. E.g., *Bacillus thuringiensis*.

1
2 **(83)Bioremediation**

- 3 1. Process of using the enzymatic actions of microbes to degrade contaminants.
4 [23]
5 2. Process of transforming pesticide waste to less toxic products using microbial activity.
6 3. Use of plants to remove pollutants from soil or water by root or/ or foliar uptake followed by
7 removal and disposal of the plant.
8

9 **(84)Biosensor**

10 Analytical device incorporating a biological material or a bio-mimic e.g. tissue,
11 microorganisms
12 organelles, cell receptors, enzymes, antibodies, nucleic acids etc.) intimately associated with
13 or integrated within a physicochemical transducer or transducing micro-system using optical,
14 electrochemical, thermometric, piezoelectric or magnetic properties etc.
15 [24]
16

17 **(85)biotransformation**

18 Conversion of the chemical structure of a pesticide catalysed by enzymes *in vitro* or *in vivo*.
19 See also *biodegradation*.
20

21 **(86)biotransformation pathway**

22 Sequence of the changes occurring in the structure of a pesticide when it is introduced into a
23 specific biological test system.
24
25

26 **(87)biotype**

27 Population within a species that has a distinct genetic variation.
28 [12]
29

30 **(88)blank value (in analysis)**

31 A reading or result originating from the matrix, reagents and any residual bias in the
32 measurement device or process, which contributes to the value obtained for the quantity in
33 the
34 analytical procedure.
35 [3]
36

37 **(89)Body burden**

38 Total toxic material an organism has ingested or inhaled from all sources over time.
39 [23]
40

41 **(90)Botanical pesticide**

42 Chemical with *pesticidal* activity that is produced naturally within a plant.
43

44 **(91)bound residue**

45 Residue associated with one or more classes of endogenous macromolecules that it cannot
46 be dis-associated from by exhaustive extraction or digestion without changing the nature of
47 the
48 exocon and/or the associated endogenous macromolecules.
49 [25]
50

51 **(92)breakdown**

52 See *degradation*.
53

1 **(93)Broad spectrum pesticide**

2 Chemical or substance which kills a wide range of pest species.

3 [10]

4
5 **(94)buffer zone**

6 Distance for environmental protection between the edge of an area where pesticide
7 application

8 is permitted and sensitive non-target areas e.g. water courses, sensitive crops, schools,
9 hospitals.

10
11 **(95)Carotenoid biosynthesis inhibitors**

12 *Carotenoid* pigments have a protective function for chlorophylls and other pigments in
13 chloroplasts. Various types of herbicides, (e.g amitrole, clomazone, or fluridone and related
14 compounds) are known to inhibit one or more of the enzymes in the mevalonic acid pathway
15 that leads to the biosynthesis of carotenoids. Another group, the isoxazoles (e.g., isoxaflutole)
16 inhibits the production of plastoquinones which are important cofactors for one of the
17 enzymes, phytoene desaturase, that is important for carotenoid biosynthesis.

18 [9]

19
20 **(96)carcinogen**

21 Agent (chemical, physical or biological) which is capable of increasing the incidence of
22 malignant neoplasms or cancer in animals.

23 [6]

24
25 **(97)carrier**

26 Gas, liquid, or solid substance used to absorb, adsorb, dilute or suspend a pesticide during

27
28
29
30 application.

31 [12]

32
33 **(98)carryover (chemistry)**

34 Process by which materials are carried into a reaction mixture to which they do not belong.
35 These materials can be either parts of a specimen, or reagents including the diluent or wash
36 solution. In such cases, *carry-over* means the transfer of material (specimen or reagents)
37 from one container, or from one reaction mixture, to another one. It can be either
38 unidirectional or bi-directional in a series of specimens or assays. The term *carry-over effect*
39 is used for carry-over from specimen to specimen.

40 [3]

41
42 **(99)carryover (field)**

43 Persistence of pesticide residues in soil after use in one crop, such that injury may occur in a
44 subsequent more sensitive crop.

45
46 **(100)catabolism**

47 1. Reactions involving the oxidation of organic substrates to provide chemically available
48 energy (e.g. ATP) and to generate metabolic intermediates.

49 2. Generally, the process of breakdown of complex molecules into simpler ones, often
50 providing biologically available energy.

51 [3]

52
53 **(101)Catchment**

1 Landform which collects precipitation and retains it in an impoundment or drains it through a
2 single outlet.

3
4 **(102)cation**

5 Monoatomic or polyatomic species having one or more elementary(positive) charges of the
6 proton.

7 [3]

8
9 **(103)Cation exchange capacity (CEC)**

10 The sum total of exchangeable *cations* that a soil can adsorb, expressed as moles or mmoles
11 of negative charge per kg of soil (or other exchange material).

12 [12]

13
14 **(104)certified reference material**

15 *Reference material*, accompanied by a certificate, whose pesticide concentrations are
16 certified

17 by procedures which establish their traceability and for which each certified concentration is
18 accompanied by an uncertainty at a stated level of confidence. Storage conditions and period
19 for which the certification remains valid may also be included for unstable materials.

20 [26]

21
22 **(105)Chelating agent**

23 Organic compounds having the ability to withdraw ions from their water solutions into soluble
24 complexes by bi- or tri-dentate ligand binding.

25 [23]

26
27 **(106)chemical name**

28 Systematic *name* of a *chemical* pesticide according to the rules of nomenclature of the

29
30
31 International Union of Pure and Applied Chemistry (*IUPAC*).

32 [12]

33
34
35 **(107)Chloracne**

36 Acne like eruption of the skin caused by excessive contact with certain chlorine containing
37 compounds.

38 [23]

39
40 **(108)chronic effect**

41 Consequence that develops slowly and/or has a long lasting course; may be applied to an
42 effect that develops rapidly and is long lasting.

43 [6]

44
45 **(109)chronic exposure**

46 Continued or intermittent long-term contact between an agent and a target.

47 [15]

48
49 **(110)chronic toxicity**

50 1. *Adverse* effect following *chronic exposure*.

51 2. Effects which persist over a long period of time whether or not they occur immediately
52 upon

53 exposure or are delayed.

1 [6]

2
3 **(111)Chloride channel activators**

4 Compounds (e.g. avermectins) with insecticidal activity that act by increasing membrane
5 conductance to chloride ions, blocking electrical activity at neuromuscular junctions, causing
6 paralysis and death. The effect is similar to that of gamma amino butyric acid (GABA) but is
7 essentially irreversible.

8 [27]

9
10 **(112)Codex Maximum Residue Limit (Codex MRL, CXL)**

11 The maximum concentration of a pesticide residue (expressed as mg/kg), recommended by
12 the Codex Alimentarius Commission to be legally permitted in or on food commodities and
13 animal feed. It is based on *good agricultural practice* data and food derived from commodities
14 that comply with the respective MRLs intended to be toxicologically acceptable.

15 [28]

16
17 **(113)colloidal**

18 1. The term refers to a state of subdivision, implying that the molecules or polymolecular
19 particles dispersed in a medium have at least in one direction a dimension roughly
20 between 1 nm and 1µm, or that in a system discontinuities are found at distances of that
21 order.

22 [3]

23 2. Composed of extremely small size particles (1 nm and 1 am) which are not removed by
24 normal filtration.

25 [23]

26
27 **(114)co-metabolism**

28 Microbial metabolism of a pesticide where the derived energy is not used to support microbial
29 growth.

30
31
32
33
34 **(115)common moiety**

35 Molecular sub-unit which is common to the structures of several pesticides or metabolites.

36
37 **(116)common name**

38 *See pesticide common name.*

39
40 **(117)community**

41 Assembly of *populations* of different species of living organisms (quite often interdependent
42 on
43 and interacting with each other) within a specified location in space and time.

44 [22]

45 *See also ecosystem*

46
47 **(118)Compatibility**

48 The characteristic of a substance, especially a pesticide, of being mixable in a formulation or
49 in
50 the spray tank for application in the same carrier without undesirably altering the
51 characteristics or effects of the individual component.

52 [12]

1 **(119)compartment**

2 Part of an organism or *ecosystem* considered as an independent system for purposes of
3 assessment of uptake, distribution and *dissipation* of a pesticide.

4 [22]

5
6 **(120)compliance (GLP)**

7 See *GLP compliance statement*.

8
9 **(121)compliance (residue)**

10 Meeting of official *maximum residue limit (MRL)* standards for food. Approved methods of
11 sampling and testing are employed to confirm that pesticide residues in food do not exceed
12 the *MRLs*.

13
14 **(122)composite sample**

15 Combined *increment samples*, or combined replicate samples, or combined samples from
16 replicate trials. Preferred term to bulk sample which is ambiguous.

17 [29]

18 See also *aggregate sample, primary sample*.

19
20 **(123)Compost**

21 1. Relatively stable humus material that is produced through controlled biological
22 decomposition of organic material in the presence of air. Composting proceeds via the
23 activities of a succession of microbial populations and usually involves a significant
24 thermophilic period.

25 2. Mixtures of garbage and degradable trash with soil in which certain bacteria in the soil
26 break down the garbage and trash into organic fertilizer.

27 [23]

28
29 **(124)Concentration**

30 Amount of a material, agent (e.g. pesticide) dissolved or contained in unit quantity in a given
31 medium or system.

32 [7]

33
34
35
36
37 **(125)concentration-effect relationship**

38 Relationship between the exposure, expressed in concentration, of a given organism, system
39 or (sub) population to a pesticide or agent in a specific pattern during a given time and the
40 magnitude of a continuously-graded effect to that organism, system or (sub) population.

41 [15]

42
43 **(126)conjugate**

44 1. Metabolite of a pesticide produced in living organisms by covalently linking two chemical
45 moieties from different sources. *Examples:* Conjugates of pesticides or their metabolites
46 with groups such as glutathione, sulfate or glucuronic acid, making them more soluble in
47 water and/or compartmentalized within the cell.

48 2. Material produced by attaching two or more substances together, e.g., a *conjugate* of an
49 antibody with a fluorochrome or enzyme.

50 After[6]

51 See also *Phase II metabolism*

52
53 **(127)Contact dermatitis** Skin swelling due to either initial acute irritation from short-term

1 contact with a substance or from chronic sensitisation that develops from long-term contact
2 with an irritating substance.

3 [10]

4
5 **(128)Contact poison**

6 1. Chemical which injures the target organism through physical contact rather than
7 through ingestion or inhalation.

8 [10]

9 2. Pesticide (herbicide) that causes injury to only the plant tissue to which it is applied or
10 which

11 is not appreciably translocated within plants.

12 [12]

13
14 **(129)contaminant**

15 1. Minor impurity in a substance.

16 2. Extraneous material added to a sample prior to or during chemical or biological analysis.

17 3. Unintended pesticide residue in an agricultural commodity or environmental compartment
18 (e.g., ground water)

19 See also *pollutant*.

20
21 **(130)control sample (field)**

22 Sample from a field test plot to which no pesticide was applied (a zero rate sample) or which
23 received chemical treatments identical to the test plots except for the test chemical.

24
25 **(131)critical concentration**

26 *Concentration* of a pesticide or agent, at and above which, adverse functional changes,
27 reversible or irreversible, occur in a cell or organ.

28 [6]

29
30 **(132)critical load**

31 Amount of a pesticide leading to a *critical concentration* when received by an environmental
32 *compartment*.

33 [22]

34
35
36
37
38
39 **(133)cross resistance**

40 One organism or biotype that confers resistance to two or more pesticides due to a single
41 resistance mechanism.

42 [12]

43
44 **(134)cumulative effect**

45 Overall change which occurs after repeated *doses* of a pesticide or substance.

46 After [6]

47
48 **(135)Cumulative risk**

49 Probability of any defined hazard occurring through a common toxic effect associated with
50 Concurrent exposure by all relevant pathways and routes of exposure to a group of chemicals
51 that share a common mechanism of toxicity.

52 [30]

53

- 1 **(136)cut-off value**
2 Numerical value set by regulatory authorities representing the limit of acceptability for a
3 property or behaviour of a compound for the final step in tiered assessment schemes.
4 See also *trigger value*.
5
- 6 **(137)Cuticle**
7 Waxy covering produced by the epidermal (outer) cells of plant leaves. Protects from
8 excessive water loss. Comprised of cutin and waxes to form a hydrophobic physical barrier to
9 the penetration of virus particles, fungal spores etc. Adjuvants can be added to pesticide
10 formulations to facilitate better cuticular penetration of the *active ingredient*.
11
- 12 **(138)cytochrome P450**
13 Member of a superfamily of heme-containing monooxygenases (oxidizing enzymes) involved
14 in pesticide or xenobiotic metabolism as well as other natural processes e.g., cholesterol
15 biosynthesis, found mainly in the endoplasmic reticulum and inner mitochondrial membranes
16 of cells.
17 After [6]
18
- 19 **(139)decomposition**
20 Breakdown of a single phase into two or more phases. The term applies also to other
21 chemical entities such as a normal molecule and a reaction intermediate.
22 [3]
23 See also, *degradation*.
24
- 25 **(140)Defoliant**
26 Chemical that causes the leaves to abscise from a plant.
27 [12]
28
- 29 **(141)degradate**
30 Chemical product resulting from *degradation* of a pesticide.
31
- 32 **(142)degradation**
33 Process by which a pesticide is broken down to simpler structures through biological or
34 *abiotic*
35 mechanisms.
36 See also *biodegradation, mineralisation*.
37 Synonyms include *breakdown* and *decomposition*
38
39
40
- 41 **(143)dermal toxicity**
42 Ability of a pesticide or other chemical to poison people or animals by contact with the skin.
43 [23]
44
- 45 **(144)desorption**
46 Decrease in the amount of adsorbed substance (e.g.pesticide) at the interphase of the soil
47 colloids (clay or organic matter).
48 [3]
49 Antonym: *Adsorption*
50
- 51 **(145)desiccant**
52 1. Drying agent.
53 2. In agriculture, a substance used for drying up crop stems and foliage to facilitate their

1 mechanical harvesting.

2 [3]

3
4 **(146)detoxification**

- 5 1. Processes of a chemical (e.g., a pesticide) modification which make a toxic molecule less
6 toxic in an organism.
7 2. Treatment of patients suffering from poisoning in such a way as to promote physiological
8 processes which reduce the probability or severity of harmful effects.

9 [6]

10
11 **(147)diffusion**

- 12 1. Spreading or scattering of a gaseous or liquid material. Eddy diffusion in the atmosphere is
13 the process of transport of gases due to turbulent mixing in the presence of a composition
14 gradient. Molecular diffusion is the net transport of molecules which results from their
15 molecular motions alone in the absence of turbulent mixing. It occurs when the
16 concentration gradient of a particular gas in a mixture differs from its equilibrium value.

17 [3]

- 18 2. Movement of suspended or dissolved particles or molecules from a more concentrated
19 region to a less concentrated region as a result of random movement of individual particles.
20 Diffusion tends to distribute particles uniformly throughout the available volume.

21 [10]

22
23 **(148)diluent (solvent extraction)**

24 The liquid or homogeneous mixture of liquids in which extractant(s) and possible modifier(s)
25 may be dissolved to form the solvent phase.

26 [3]

27 *Note* 1. The term carrier, which implies an inert diluent is not recommended.

28 *Note* 2. Although the diluent may well be a single liquid or even the major portion of the
29 extracting phase, the term solvent should not be used in this sense as it has a
30 much wider meaning in the context of liquid-liquid extraction, although the term
31 cosolvent may be used in certain circumstances.

32 *Note* 3. The diluent by itself does not extract the main (extractable) solute appreciably.

33
34 **(149)Diluent (pesticide applications)**

35 Liquid or solid material used to dilute a concentrated pesticide formulation prior to application.
36 Most commonly water for spray application.

37
38 **(150)Dioxin**

39 Colloquial (short) name for any of a family of compounds known chemically as
40 polychlorinated

41
42
43 dibenzo-p-dioxins. Concern about them arises from their occurrence as contaminants in
44 commercial products (or emissions from incineration) and because some (e.g 2,3,7,8-tetra
45 chloro dibenzo(*b,e*) (1,4)-dioxin) can be toxic and teratogenic in mammals.

46 [23]

47
48 **(151)Dislodgeable foliar residues (DFRs)**

49 Portion of a pesticide residue on treated vegetation that is readily removable and may be used
50 as an index for exposure of farm workers. Generally measured by the residue removed when
51 leaf-discs are shaken briefly in water or by scuffing the treated area with cloth covered
52 devices.

53 [31]

1 Synonym: *Transferable residue*

2

3 **(152)dispersible granule**

4 Dry granular pesticide formulation that will separate or disperse to form a suspension when
5 added to water.

6 [12]

7

8 **(153)dissipation**

9 Loss of pesticide residues from an environmental compartment due to degradation and
10 transfer to another environmental compartment.

11

12 **(154)dissipation time 50%(DT₅₀)**

13 Time required for one-half the initial quantity or concentration of a pesticide to dissipate from
14 a
15 system. No assumption as to the rate equation is made.

16 See also *half-life, T_{1/2}*.

17

18 **(155)Dormancy**

19 State of inhibited seed germination or growth of a plant organ when in an environment
20 normally conducive to growth.

21 [12]

22

23 **(156)Dose**

24 Total amount of a pesticide or agent administered to, taken up or absorbed by an organism,
25 system or (sub) population.

26 [7]

27

28 **(157)dose-effect relationship**

29 Relationship between the total amount of an agent administered to, taken up or absorbed by
30 an organism, system or (sub) population and the magnitude of a continuously-graded effect to
31 that organism, system or (sub) population.

32 [7]

33

34 **(158)dose-response relationship**

35 Relationship between the amount of a pesticide administered to, taken up or absorbed by an
36 organism, system or (sub) population and the change developed in that organism, system or
37 (sub) population in reaction to the pesticide (or agent).

38 [7]

39

40 **(159)drift control agent**

41 *Formulant* that controls the distribution of spray droplet sizes and prevents production of
42 excessive fines.

43

44

45 **(160)dry weight basis**

46 Pesticide residue concentration reported as if the residue were wholly contained in the dry
47 matter of the sample, i.e. analytical results are corrected for the water content of the *test*
48 *sample*. Residues in soils and feeds, and *maximum residue limits (MRLs)* for feedstuffs are
49 expressed on a *dry weight basis*.

50

51 **(161)dustable powder (DP)**

52 Free flowing powder suitable for dusting.

53 [2]

1
2 **(162)EC 50**

3 See *median effective concentration*.

4
5 **(163)ECD**

6 See *electron capture detector*.

7
8 **(164) Ecdysone agonists**

9 Compounds that disrupt the normal molting process in insects by inducing a lethal, premature
10 molt. One example is the diacylhydrazine, tebufenozide.

11
12 **(165)ecosystem**

13 Assembly of populations of different species (often interdependent on and interacting with
14 each other) interacting with their surroundings within a specified physical location and forming
15 a functional entity.

16 [21]

17 See also *community*.

18
19 **(166)ecotoxicologically (environmentally) relevant concentration (ERC)**

20 Concentration of a pesticide (active ingredient, formulations, and relevant metabolites) that is
21 likely to affect a determinable ecological characteristic of an exposed system. It is related to
22 the toxicity characteristics, generally the *no observable effect concentration*, to the most
23 sensitive species or groups of species.

24 After [22]

25
26 **(167)Ecotype**

27 A population with a species that has developed distinct morphological or physiological
28 characteristics in response to a specific environment and that persists when individuals are
29 moved to a different environment.

30 [12]

31
32 **(168)Effect assessment**

33 Combination of analysis and inference of possible consequences of the exposure to a
34 particular agent (e.g. pesticide) based on knowledge of the dose-effect relationship
35 associated

36 with that agent in a specific target organism, system or (sub) population.

37 [7]

38
39 **(169)Efficacy**

40 Ability of a pest control product to fulfil the claims made on the product label. It includes the
41 extent of control of the pest problem and considers any adverse effects on the treated site.

42 [32]

43
44
45
46
47 **(170)electron capture detector (in gas chromatography)**

48 A small radioactive source containing ^3H or ^{63}Ni ionises the molecules of the carrier gas
49 (nitrogen or argon-methane) and a potential difference creates a small current. This current is
50 reduced when an electronegative substance (such as a halocarbon) is introduced. The
51 reduction in current is a measure of the concentration of the electronegative substance. The
52 detection limit (threshold) varies greatly according to the substances to be analysed and can
53 reach a mixing ratio of 10^{-12} . The linear dynamic range may be 10^4 but the maximum

1 measuring value generally lies below 1.

2 [3]

3

4 **(171)Elicitor**

5 Molecule produced by the host (or pathogen) that induces a response by the pathogen (or
6 host), e.g. many *Pythium spp.* produce large protein elicitor molecules which serve as
7 virulence factors by attacking host cell walls.

8

9 **(172)ELISA**

10 See *immunoassay*.

11

12 **(173)Emergence**

13 The event in seedling establishment when a shoot becomes visible by pushing through the
14 soil
15 surface.

16 [12]

17

18 **(174)emulsifiable concentrate (EC)**

19 Single phase, homogeneous, liquid pesticide formulation that forms an emulsion when added
20 to water.

21 [12]

22

23 **(175)emulsifier**

24 1. *Surfactant* which, when present in small amounts, facilitates the formation of an *emulsion*,
25 or enhances its *colloidal* stability by decreasing either or both of the rates of aggregation
26 and coalescence.

27 [3]

28 2. Substance that promotes the suspension of one liquid in another liquid with which it is
29 not normally miscible.

30 [12]

31

32 **(176)Enantiomer**

33 One of a pair of molecular entities which are mirror images of each other and non-
34 superimposable.

35 [3]

36 See also, *racemate*

37

38 **(177)Encapsulated formulation**

39 Pesticide enclosed in capsules (or beads) of material to control the rate of release of active
40 ingredient and thereby extend the period of activity.

41 [12]

42

43 **(178)Endangered species**

44 Animals, birds, fish, plants, or other living organisms threatened with extinction by man-made
45 or natural changes in their environment. In some jurisdictions, "*endangered species*" is
46 defined

47

48

49

50 in legislation e.g. in the USA, the requirements are contained in the Endangered Species Act.

51 [23]

52

53 **(179)endocon**

1 Portion of a conjugated metabolite which is derived from a natural product of the metabolising
2 organism such as a sugar, amino acid or other organic acid.

3 See also *exocon*, *phase II metabolism*.

4 [3]

5
6 **(180)endpoint**

7 Measurable ecological or toxicological characteristic or parameter of the test system (usually
8 an organism) that is chosen as the most relevant assessment criterion (e.g., death in an
9 acute

10 test or tumour incidence in a chronic study).

11
12 **(181)End-use product (EP)**

13 Product containing active ingredient(s) and usually formulant(s) that has been manufactured,
14 packaged and labelled with instructions for direct pest control use or application in a form that
15 is usable by the consumer.

16 [14]

17
18 **(182)enforcement method**

19 See *regulatory method*.

20
21 **(183)enhanced degradation**

22 Increased rate of degradation of a pesticide in soil or other environmental matrix by a
23 population of microorganisms that has adapted to metabolise it through previous exposure to
24 it
25 or a similar chemical.

26 Synonyms include *accelerated degradation* and *enhanced biodegradation*.

27
28 **(184)enolpyruvyl shikimate acid phosphatase synthase (EPSPS) inhibitor**

29 Herbicide, e.g., glyphosate, that inhibits EPSPS which is involved in the production of
30 aromatic
31 amino acids such as phenylalanine, tyrosine and tryptophan in plants. . These amino acids are
32 precursors for compounds which have numerous essential functions in plants.

33 [9]

34
35 **(185)enterohepatic circulation**

36 Cyclical process in which a pesticide residue is absorbed and transported to the liver,
37 metabolised (often including conjugation), transported to the intestine by the bile, reabsorbed
38 (often after deconjugation), and transported back to the liver for further metabolism.

39 [4]

40
41 **(186)Environmental fate**

42 Destiny of a pesticide or chemical after release to the environment involving considerations
43 such as transport through air, soil or water, bio-concentration, degradation etc.

44 [10]

45
46 **(187)environmental impact assessment**

47 Assessment of the potential releases of a pesticide to the environment and their potential
48 effects upon the environment and its components including man.

49 See *risk assessment*.

- 1 **(188)environmental risk**
2 Probability that an *adverse effect* on humans or the environment will be observed for a given
3 *exposure* to a pesticide based on the frequency of occurrence and the sensitivity of the
4 system.
5 See *risk assessment*.
6
- 7 **(189)Epidemiology**
8 Study of the incidence and distribution of disease or toxic effects within a population.
9 [10]
10
- 11 **(190)Epinasty**
12 'State' or 'condition' in which faster growth on the upper side of a plant organ or part
13 (especially the leaf) causes it to bend or curl downward.
14 [12]
15
- 16 **(191)estimated environmental concentration (EEC)**
17 Predicted concentration of a pesticide within an environmental *compartment* based on
18 estimates of quantities released, discharge patterns and inherent disposition of the pesticide
19 (fate and distribution) as well as the nature of the specific receiving ecosystems.
20 [22]
21 See also *expected environmental concentration (EEC)*
22
- 23 **(192)exocon**
24 Portion of a conjugated metabolite which is derived from the parent pesticide.
25 See also *aglycon*.
26 [3]
27
- 28 **(193)excretion**
29 Elimination of an absorbed pesticide or its metabolites through some tissue of the body and
30 its
31 appearance in urine, faeces or other products normally leaving the body.
32 [6]
33
- 34 **(194)expected environmental concentration (EEC)**
35 Calculated concentrations of a pesticide in various environmental compartments based on
36 calculations using maximum-exposure scenarios. EEC models assume a maximum number
37 of
38 applications per growing season at the maximum rate of application according to the
39 application methods stated on the product label.
40 [33]
41
- 42 **(195)exposure**
43 Concentration or amount of a pesticide (or agent) that reaches a target organism, system or
44 (sub) population in a specific frequency for a defined duration.
45 [15]
46
- 47 **(196)exposure assessment**
48 Evaluation of the exposure of an organism, system or (sub) population to a pesticide or agent
49 (and its derivatives). Exposure assessment is the third step in the process of risk assessment.
50 [7]
51
- 52 **(197)Exposure surface**
53 Surface on a target where a pesticide or agent is present. With mammals, examples of outer

1 exposure surfaces include the exterior of an eyeball, the skin surface and a conceptual
2 surface

3
4
5 over the nose and open mouth. Examples of inner exposure surfaces include the gastro-
6 intestinal tract, the respiratory tract and the urinary tract lining
7 [15]

8
9 **(198)extractability (in solvent extraction)**

10 A property which qualitatively indicates the degree to which a substance (e.g. pesticide) is
11 extracted from a matrix (e.g. soil). The term is imprecise and generally used in a qualitative
12 sense. It is not a synonym for fraction extracted.
13 [3]

14
15 **(199)extraneous maximum residue limit (EMRL)**

16 Maximum concentration of a pesticide residue, arising from environmental sources (including
17 former agricultural uses), other than from the use of a pesticide directly or indirectly on the
18 commodity, that is recommended or permitted in or on a feed or food commodity.
19 After [16]

20
21 **(200)fat basis**

22 Residues and *maximum residue limits* (MRLs) of fat-soluble pesticides in animal
23 commodities
24 may be expressed in terms of their concentration in the fat rather than the whole product.

25
26 **(201)Fate**

27 Pattern of distribution of an agent (e.g. pesticide) its derivatives or metabolites in an organism,
28 system, compartment (e.g. of the environment) or (sub) population

29
30 **(202)fetotoxicity**

31 Compound induced toxic effect on the fetus during pregnancy.
32 [10]

33
34 **(203)flame ionisation detector (FID, in gas chromatography)**

35 Gases emerging from the column are fed into a hydrogen flame across which an electrical
36 potential is placed. Certain molecules ionise easily in the flame and current produced is
37 proportional to the instantaneous flow rate of the eluted component. The detector is relatively
38 insensitive to inorganic molecules and is most used for organic compounds. Concentrations
39 below 1 ppmv are easily detected. The linear dynamic range is between 10^{-3} and 10^{-5} .
40 [3]

41
42 **(204)flame photometric detector (FPD) (in gas chromatography)**

43 Eluent from the column is fed into a hydrogen-rich flame and produces light emission. Optical
44 filters are used to select the wavelength range of the emission which is characteristic of
45 specific atoms (usually sulfur or phosphorous). The detector is very specific, depending on the
46 choice of optical filters. The FPD can detect the S- and P-containing compounds down to 10^{-3}
47 ppmv, but the response is non-linear for S.
48 [3]

49
50 **205)formulation**

- 51 1. Pesticide preparation supplied by a manufacturer for practical use.
52 2. Process, carried out by manufacturers, of preparing pesticides for practical use.
53 [12]

1
2 **(206)Field drainage**

3 Removal of excess water from soil and transport to surface waters in order to improve soil
4 productivity and traffic ability.
5

6
7 **(207)Flowable**

8 See *suspension concentrate*.
9

10 **(208)food chain - primary consumers**

11 Heterotrophic organisms (e.g., filter feeding invertebrates such as daphnia species) using
12 organic substances directly from *primary producers* (e.g., algae) as a carbon and energy
13 source.
14

15 **(209)food chain - primary producers**

16 Autotrophic organisms (e.g., algae, higher plants) which convert inorganic compounds during
17 the process of photosynthesis or chemosynthesis into organic compounds (cell material) of
18 higher energy content. These organisms represent the first trophic level of the food chain.
19

20 **(210)food chain - secondary consumers**

21 Heterotrophic organisms (e.g., predator animals) feeding on *primary consumers*.
22

23 **(211)food chain - secondary producers**

24 Heterotrophic organisms (e.g., animals) using organic substances as a carbon and energy
25 source.
26

27 **(212)food chain - primary decomposers**

28 Heterotrophic organisms (e.g., bacteria) using dead organic matter from all trophic levels as a
29 carbon and energy source.
30

31 **(213)food chain - secondary decomposers**

32 Heterotrophic organisms (e.g., certain soil fungi, collembola, worms) using already partially
33 decomposed organic matter as a carbon and energy source.
34

35 **(214)Food Quality Protection Act (FQPA)**

36 1996 update / amendment to the US Federal Insecticide, Fungicide and Rodenticide Act
37 (FIFRA) and the Federal Food Drug, and Cosmetic Act (FFDCA). FQPA fundamentally
38 changes the way EPA regulates pesticides to “establish a more consistent, protective
39 regulatory scheme, grounded in sound science”. FQPA mandates a single, health-based
40 standard for all pesticides in all foods; provides special protections for infants and children;
41 expedites approval of safer pesticides; creates incentives for the development and
42 maintenance of effective pesticides; and requires periodic re-evaluation of pesticide
43 registrations and tolerances to ensure that the scientific data supporting pesticide
44 registrations
45 will remain up to date in the future.
46 [30]

47
48 **(215)formulant**

49 Any added material in a pesticide formulation other than the biologically *active ingredient(s)*.
50 This may include a *carrier* or other substances which enhance the biological activity or
51 physio-
52 chemical properties of the formulation.
53 [33]

1 See also *adjuvant, diluent, inert, sticker, surfactant, vehicle*

2
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9

(216)formulation

See *pesticide formulation*.

(217)Formulate

Process of combining a *pesticide active ingredient* with various *carriers, adjuvants, solvents* etc. to develop the end use product.

(218)fortified sample

See *spiked sample*.

(219)FPD

See *flame photometric detector*

(220)fresh weight basis

Pesticide residues are reported on the laboratory sample as it is received, with no allowance for the moisture content. *Maximum residue limits (MRLs)* and pesticide residues in food commodities are expressed in this way.

(221)Freundlich isotherm

Empirical relationship describing the *adsorption* of a solute from a liquid or gaseous phase to a solid in which the quantity of material adsorbed per unit mass of adsorbent is expressed as a function of the equilibrium concentration of the sorbate.

See also K_d .

(222)frozen storage stability

See *storage stability test*.

(223)FTIR

Fourier transform infrared spectroscopy.

(224)fumigation

Use of a pesticide in gas or vapour form.

(225)fungicide

Pesticide used for the control of *fungi*.

(226) GABA antagonists

Insecticidal compounds that bind to the chloride channel in nerves and block the action of the neurotransmitter, gamma aminobutyric acid (GABA). This effect results in the hyper-excitation of the central nervous system (CNS) in insects and mites. The cydodiene, endosulfan and the phenylpyrazole, fipronil have this effect in insects but act at slightly different sites in the channel.

[27]

(227)gas chromatography (GC)

50
51
52

1 A separation technique in which the *mobile phase* is a gas. Gas chromatography is always
2 carried out in a column containing a stationary phase (liquid or solid) with the separation of
3 components being based on differential partitioning between the stationary phase and the
4 carrier gas.

5 From [3] with modification.

6
7 **(228)GC-EC**

8 Gas chromatography with electron capture detector.

9
10
11
12
13 **(229)GC-MS**

14 Gas chromatography-mass spectrometry.

15
16 **(230)GC-MSD**

17 Gas chromatography with mass-selective detection (usually low resolution mass
18 spectrometry
19 using selected ions).

20
21 **(231)Generic pesticide**

22 A *pesticide* for which the original manufacturer's patent on the *active ingredient* has expired in
23 a certain geography and production is now also occurring via one or more secondary
24 manufacturers.

25
26 **(232)Genotoxic**

27 Capable of causing a heritable change to the structure of DNA thereby producing a mutation.
28 [6]

29
30 **(233)GLC**

31 Gas liquid chromatography.

32
33 **(234)GLP**

34 See *Good Laboratory Practice*.

35
36 **(235)GLP Archive facilities**

37 Facilities that provide for the storage and retrieval of the study plan, raw data, final reports,
38 sample of test items and specimens. Archive design and conditions should protect contents
39 from untimely deterioration.

40 Derived from [35]

41
42 **(236)GLP chain of custody**

43 Set of procedures and traceable records that demonstrate an unbroken control over, or
44 custody of, a document, or raw data, or a sample from its collection through to its final
45 disposition.

46 Derived from [35]

47
48 **(237)GLP compliance status**

49 The level of adherence of a test facility to the *GLP* principles as assessed by the national
50 *GLP*

51 monitoring authority.

52 Derived from [35]

1 **(238)GLP compliance statement**

2 Signed and dated statement on the final report to indicate acceptance of responsibility for the
3 validity of the data and to indicate the extent to which the study complies with the principles of
4 *GLP*.

5 Derived form [35]

6
7 **(239)GLP principal Investigator**

8 In the event of a multi-site study, management designates a person who is appropriately
9 trained, qualified and experienced to supervise the delegated phase(s) of the study. The
10 principal investigator will ensure that the delegated phases of the study are conducted in
11 accordance with the applicable principles of *GLP*.

12 Derived from [35]

13
14
15
16 **(240)GLP protocol**

17 See *GLP study plan*.

18
19 **(241)GLP quality assurance program**

20 Statement prepared by the QAU, to be included with the final report, which specifies types of
21 inspections and their dates and including the phase(s) of the study inspected, and the dates
22 inspection results were reported to management and the study director and principal
23 investigator, if applicable. This statement serves to confirm that the final report reflects the
24 raw
25 data.

26 Derived from [35]

27
28 **(242)GLP quality assurance statement**

29 Statement prepared by the *quality assurance unit* specifying the dates inspections were made
30 and any findings which were reported to management and to the study director. This
31 statement is part of the final report of a study.

32 Derived from [35]

33
34 **(243)GLP quality assurance unit (QAU)**

35 Sub-section of the test facility, separate from actual testing, responsible for internal audits of
36 the facility and its *Study Reports* to ensure compliance with *GLP*. The QAU is also generally
37 responsible for the administration and training in all aspects of the quality assurance system.

38 Derived from [35]

39
40 **(244)GLP standard operating procedure (SOP)**

41 Written procedure, authorised by management which describe how to perform a certain
42 routine test or activity normally not specified in detail in study plans or test guidelines, e.g.,
43 arrival, identification and storage of samples, standards or reagents; operation, maintenance,
44 and calibration of apparatus; preparation of reagents; quality assurance procedures.

45 Derived from [35]

46
47 **(245)GLP study**

48 Experiment or set of experiments conducted under *GLP*.

49 Derived from [35]

50
51 **(246)GLP study audit**

52 Review by the *quality assurance unit* of an interim or final report, including raw data from a
53 study, confirming that the study was carried out in accordance with the study plan and

1 *standard operating procedures* and that it has been accurately and completely reported in
2 compliance with *GLP*.
3 Derived from [35]
4

5 **(247)GLP study Director**

6 Person responsible for the overall conduct of a study i.e. ensuring that all phases of the study
7 are conducted under *GLP* according to the study plan.
8 Derived from [35]
9

10 **(248)GLP test facility Inspection**

11 Check of a test facility, a study or parts of a study by an internal or external authority to ensure
12 compliance with *GLP* guidelines. Internal inspections are carried out by the *quality assurance*
13 *unit*.
14 Derived from [35]
15 See also *GLP study audit*.
16
17

18 **(249)GLP study plan**

19 Document which determines the entire scope of a study conducted under *GLP*. A written
20 study plan must be completed and approved by the *Study Director* before a study starts. It
21 contains information such as the title of study; name or code of test and reference
22 substances;
23 name and address of sponsor, test facility, study director and principal investigators; dates for
24 start and end of study; methods including relevant *standard operating procedures (SOPs)*; list
25 of material to be archived.
26 Derived from [35]
27

28 **(250)glucuronides**

29 Components resulting from the conjugation of a pesticide or its metabolite with glucuronic
30 acid.
31

32 **(251)Glutamine synthetase (GS) inhibitors**

33 The *GS* enzyme has many important functions in plants including ammonia assimilation,
34 ammonia recycling, synthesis of amino acids, photorespiration, and maintaining low levels of
35 glyoxalate to prevent inhibition of ribulose-1,5-biphospate carboxylase (*RUBISCO*), a key
36 enzyme in carbon fixation. Phosphinothricin, a natural microbial product, and glufosinate, its
37 synthetic analogue, are two herbicidal inhibitors of this enzyme.
38 [9]
39

40 **(252)glycosides**

41 Mixed acetal (ketal) conjugates resulting from the attachment of a *glycosyl group* (on a
42 saccharide or saccharide derivative) to a non-acyl group *RO-* (e.g. on a pesticide which itself
43 may be derived from a saccharide) and chalcogen replacements thereof (*RS-*, *Rse*). In plants
44 and insects, the saccharide *endocon* is commonly an aldohexose.
45 After [3]
46

47 **(253)good agricultural practice (GAP)**

48 In the use of pesticides, it includes the officially recommended or nationally authorized uses
49 of
50 pesticides under actual conditions necessary for effective and reliable pest control. It
51 encompasses a range of levels of pesticide applications up to the highest authorised use
52 applied in a manner which leaves a residue which is the smallest amount practicable.
53 [36]

1
2 **(254)good experimental field practice**

3 The formalised process for designing and recording the practices used in the performance of
4 field investigations with pesticides, and which assure the reliability and integrity of the data.
5 See *GLP*.

6
7 **(255)good laboratory practice (GLP)**

8 The formalised process and conditions under which laboratory studies on pesticides are
9 planned, performed, monitored, recorded, reported and audited. Studies performed under
10 *GLP* are based on the national regulations of a country and are designed to assure the
11 reliability and integrity of the studies and associated data. The US-EPA *GLP* definition also
12 covers field experiments (see *Good experimental field practice*).

13 Derived from [35]

14
15 **(256)GPC**

16 Gel permeation chromatography

17 See also *size exclusion chromatography(SEC)*

18
19
20
21
22 **(257)Graminicide**

23 *Pesticide (herbicide)* used for the control of weedy grasses (*Gramineae*).

24 [12]

25
26 **(258)granular**

27 Dry pesticide formulation consisting of discrete particles generally $<10\text{ mm}^3$ and designed to
28 be applied without a liquid carrier.

29 [12]

30
31 **(259)ground water**

32 Water present in the saturated subsurface zone of the soil profile, where all open
33 spaces/pores in the sediment and rock are filled with water.

34
35 **(260)Growth regulator**

36 Chemical, often a natural or synthetic hormone, used to modify or control the growth and
37 development of a plant or insect, sometimes for the purpose of control.

38
39 **(261)Guarantee**

40 Amount of active ingredient contained in a product, expressed as either a percentage or a
41 weight. Most regulators require that the guarantee be stated on all pesticide labels. In
42 Canada,

43 the *guarantee* statement represents an expression of the nominal value (or typical
44 concentration) of the active ingredient within a representative sample of a pesticide as
45 required on the registered product label.

46 [14]

47
48 **(262)guideline level**

49 Maximum concentration of a pesticide residue in or on a feed or food commodity, resulting
50 from a use reflecting *good agricultural practice*, but where an *acceptable daily intake* has not
51 been estimated.

52
53 **(263)guideline value**

1 Maximum recommended pesticide residue in an environmental medium that ensures
2 aesthetically pleasing air, water or food and does not constitute a significant risk to the user.
3 [4]

4
5 **(264)half-life ($t_{1/2}$)**

6 For a given reaction, the *half life, $t_{1/2}$* , of a reactant is the time required for its concentration
7 to
8 reach a value that is the arithmetic mean of its initial and final (equilibrium) values. For a
9 single
10 reactant that is entirely consumed (e.g. *pesticide degradation*) it is the time taken for the
11 reactant concentration to fall to one half its initial value.

12 [3]

13
14 **(265)hazard**

15 Inherent property of an agent (e.g. pesticide) or situation having the potential to cause adverse
16 effects when an organism, system or (sub) population is exposed to that agent or situation.

17 [7]

18
19 **(266)hazard assessment**

20 Process which includes hazard identification and hazard characterization and focuses on the
21 hazard in contrast to risk assessment where exposure assessment is a distinct additional
22 step

23 [7].

24
25
26
27 **(267)hazardous distance for the most sensitive effect (HDSE)**

28 Statistically determined safety margin corresponding to a distance from treated areas at
29 which
30 protection of the terrestrial environment can be adequately achieved as measured by the most
31 sensitive non-target species.

32 See also *buffer zone, margin of safety*.

33
34 **(268)health advisory level (HAL)**

35 Estimate of upper concentration limit for a pesticide in drinking water that can be consumed
36 for

37 a lifetime without *adverse effects*. HALs generally do not have formal legal significance but
38 have been used, particularly in the USA, for preliminary *risk assessment*.

39
40 **(269)herbicide** *Pesticide* used for the control of unwanted plants or weeds.

41
42 **(270)hormone**

43 Chemical substance produced and secreted in one part of an organism and transported to
44 another part of that organism where it has a specific effect.

45 [10]

46 See also *growth regulator*.

47
48 **(271)HPLC**

49 High performance liquid chromatography.

50
51 **(272)HPTLC**

52 High performance thin layer chromatography.

53

- 1 **(273)HRGC**
2 High resolution gas chromatography (GLC) with narrow bore capillary columns.
3
- 4 **(274)hydrophilic**
5 'Water loving'. The capacity of a molecular entity or of a substituent to interact with polar
6 solvents, particularly water, or with other polar groups.
7 [3]
8
- 9 **(275)hydrophobic**
10 'Water avoiding'. The capacity of a molecular entity or of a substituent to interact with non-
11 polar solvents or with other non-polar groups.
12 [3]
13
- 14 **(276)hydrolysis**
15 *Solvolysis* by water.
16 [3]
17
- 18 **(277)Hydroxy phenyl pyruvate dioxygenase (HPPD) inhibitors**
19 The HPPD enzyme converts hydroxyphenyl pyruvate into homogentisate, a key step in
20 plastoquinone biosynthesis. Plastoquinone is a cofactor of the enzyme, phytoene desaturase
21 (PDS) in the carotenoid biosynthetic pathway that converts phytoenes to lycopenes that
22 eventually become carotenoids in plants. *Herbicidal inhibitors* of this enzyme include
23 isoxazoles (e.g., isoxaflutole), triketones (e.g., mesotrione) and pyrazoles (e.g., pyrazoxyfen).
24 [9]
25
26
27
28
29
- 30 **(278)identification**
31 Process of unambiguously determining the chemical identity of a pesticide or metabolite in
32 experimental or analytical situations.
33
- 34 **(279)immobilisation**
35 1. Process leading to restricted mobility of a pesticide in a plant or soil due to strong binding.
36 2. Incorporation of terminal pesticide *degradates* into complex organic forms in microbial or
37 plant tissue.
38
- 39 **(280)immunoassay**
40 Ligand-binding assay that uses a specific antigen or antibody, capable of binding to the
41 analyte, to identify and quantify substances. The antibody can be linked to a radioisotope
42 (radioimmunoassay, RIA) or to an enzyme which catalyses an easily monitored reaction
43 (enzyme-linked immunosorbent assay, ELISA), or to a highly fluorescent compound by which
44 the location of an antigen can be visualized (immunofluorescence).
45 [3]
46
- 47 **(281)impurity**
48 By-product of the manufacture or storage of a pesticide. Any substance in a control product
49 other than an active ingredient or a formulant (e.g. contaminants, residual starting materials,
50 reaction products, degradation products or products added for purposes of extraction or
51 purification). Impurities require definition, evaluation and regulation (if toxicologically
52 significant).
53 After [15]

- 1
2 **(282)increment sample**
3 Individual portion (unit) of material collected by a single operation of a sampling device from
4 bulk materials or large units.
5 [29]
6
7 **(283)incurred residue**
8 Residue in a commodity resulting from specific use of a pesticide, consumption by an animal
9 or environmental contamination in the field, as opposed to residues from laboratory
10 fortification
11 of samples.
12
13 **(284)inert ingredient**
14 *Formulation* component other than the active ingredient (e.g. solvent, emulsifier, diluent,
15 carrier).
16
17 **(285)in-life phase**
18 Phase of a study following treatment in which the test system is alive/growing.
19
20 **(286)Insect growth regulator (IGR)**
21 See growth regulator or hormone.
22
23 **(287)Insecticide**
24 *Pesticide* used for the control of *insects*.
25
26 **(288)Instrumental analysis solvent**
27 High purity solvents intended for use in pesticide residue analysis (e.g. HPLC etc.).
28 See also *reagent purity*
29
30
31
32 **(289)Intake**
33 Process by which a pesticide or agent crosses an outer exposure surface of a target without
34 passing an absorption barrier, i.e. through ingestion or inhalation.
35 [15]
36
37 **(290)integrated pest management (IPM)**
38 Use of pest and environmental information in conjunction with available pest control
39 technologies to prevent unacceptable levels of pest damage by the most economical means
40 and with the least possible hazard to persons, property and the environment.
41 [30]
42
43 **(291)international estimated daily intake (IEDI)**
44 Prediction of the long-term daily intake of a pesticide residue on the basis of the assumptions
45 of average daily food consumption per person and median residues from supervised trials,
46 allowing for residues in the edible portion of a commodity and including residue components
47 defined by the JMPR for estimation of dietary intake.
48 [28]
49
50 **(292)International estimated short-term intake (IESTI)**
51 Prediction of the short-term intake of a pesticide residue on the basis of the assumptions of
52 high daily food consumption per person and highest residues from supervised trials, allowing

1 for residues in the edible portion of a commodity and including residue components defined
2 by
3 the JMPR for estimation of dietary intake. It is expressed in milligrams of residue per kg body
4 weight.

5 [16]

6
7 **(293)Invert emulsion**

8 Suspension of minute water droplets in a continuous oil phase.

9 [12]

10
11 **(294)isomer**

12 One of several species (or *molecular entities*) that have the same atomic composition
13 (molecular formula) but different *line formulae* or different *stereochemical formulae* and hence
14 different physical and/or chemical properties.

15 [3]

16
17 **(295)n-vitro**

18 'In glass', referring to a study in the laboratory usually involving isolated organ, tissue, cell or
19 biochemical systems.

20 [3]

21
22 **(296)in-vivo**

23 'In the living body', referring to a study performed on a living organism.

24 [3]

25
26 **(297)K_d**

27 See *soil partition coefficient*.

28
29 **(298)K_{oc}**

30 See *soil organic partition coefficient*.

31
32
33
34
35 **(299)K_{ow}**

36 See *octanol – water partition coefficient*.

37
38 **(300)Label**

39 Legally-registered text as part of the registration process which governs the use of the
40 product.

41 The label is a legally-binding document which regulates the sale and use of all registered
42 pesticides.

43 [32]

44 See also *radiolabelled*

45
46 **(301)laboratory sample**

47 Sample or subsample(s) sent to or received by the laboratory.

48
49 **(302)lacrimation**

50 Secretion and discharge of tears.

51 [23]

52
53 **(303)lag phase**

1 Period which may precede commencement of rapid degradation of a pesticide by a microbial
2 population. It is the period needed either for induction of microbial enzymes or for growth of
3 the microbial population to adequate size.

4 See also *enhanced degradation*.

5
6 **(304)Lateral movement**

7 Movement of a pesticide through soil, generally in a horizontal plane, from the original site of
8 application.

9 [12]

10
11 **(305)LC 50**

12 See *median lethal concentration*.

13
14 **(306)LD 50**

15 See *median lethal dose*.

16
17 **(307)leachate**

18 Aqueous phase percolating through a soil profile or a soil column.

19
20 **(308)leaching**

- 21 1. Removal of materials in solution from the soil or other substances.
22 2. Downward movement of pesticides into a soil profile with soil water (the pesticide may or
23 may not be in true solution and may or may not move from the soil).

24 [12]

25
26 **(309)limit of detection (LOD)**

27 Lowest concentration of a *pesticide residue* in a defined *matrix* where positive identification
28 can be achieved using a specified method.

29
30 **(310)limit of quantitation (LOQ)**

31 Lowest concentration of a *pesticide residue* in a defined *matrix* where positive identification
32 and quantitative measurement can be achieved using a specified analytical method.

33
34
35
36
37 **(311)Limit of reporting**

38 Practical limit of residue quantitation at or above the *LOQ*. The conservative limit of
39 quantitation for a defined matrix and method which may vary between laboratories or within
40 the one laboratory from time to time because of different equipment, techniques and
41 reagents.

42 Commonly either the lower limit of the calibrated range of the method or the lowest level at
43 which quantitative recovery of the analyte has been demonstrated.

44
45 **(312)lipophilic**

46 Literally 'fat-loving'. Applies to molecular entities (or parts of molecular entities) having a
47 tendency to dissolve in fat-like (e.g., hydrocarbon) solvents.

48 [3]

49
50 **(313)lot**

51 Quantity of material which is assumed to be a single population for sampling purposes.

52 See also *batch*.

53 [3]

1
2 **(314)lowest-observed-adverse-effect level, LOAEL**

3 Lowest concentration or amount of a pesticide or agent (dose), found by experiment or
4 observation, which causes an adverse effect on morphology, functional capacity, growth,
5 development, or life-span of a target organism distinguishable from normal (control)
6 organisms
7 of the same species and strain under defined conditions of exposure.

8 [6]
9

10 **(315)Lowest-effective-use-rate (LER)**

11 Minimum application rate required to provide effective control of a target pest, in terms of
12 level, duration and consistency across a broad range of conditions in which the product will
13 be applied. The *LER* will be specific to site/pest combination and management practices.

14 [32]
15

16 **(316)lysimeter**

17 Device for measuring leaching losses from a column or block of soil. The simplest lysimeters
18 may be devices for sampling a portion of the water *leaching* through a natural sediment or soil
19 (e.g., suction lysimeter) whereas more elaborate lysimeters may involve the confinement of
20 an
21 entire segment of soil from which all *leachate* is collected (e.g., monolithic lysimeter).
22

23 **(317)macropore**

24 Soil pore larger than 1 mm in diameter including interparticle void, earthworm or rodent
25 burrow, drying crack, and decayed root channel.

26 See *preferential flow*.
27

28 **(318)margin of safety (MOS)**

29 Ratio of the highest estimated or actual level of exposure to a pesticide and the toxic
30 threshold
31 level (usually the *NOEC* or *NOEL*).

32 [22]

33 See also *uncertainty factor*.
34

35 **(319)market basket survey**

36 *Pesticide residue monitoring* on a wide range of food items collected from consumer points of
37 sale and in proportions approximating consumption patterns in the local population. Samples
38 are prepared for analysis according to Codex guidelines i.e. minimal preparation.

39 See also *total diet study*.
40
41

42 **(320)material preservatives**

43 *Pesticidal* products that are usually applied during the manufacture of various materials to
44 protect them against bacterial or fungal deterioration. Materials may include textiles, leather,
45 aqueous emulsions, paints, packaging materials, plastics, vinyls, rubber, waxes dyes, etc.

46 [14]
47

48 **(321)Material safety data sheet (MSDS)**

49 Document or form containing the properties of a particular substance. It is intended to provide
50 workers and emergency personnel with the procedures for handling that substance in a safe
51 manner. The *MSDS* must include information such as physical data (e.g. melting point,
52 boiling point, flash point, etc.) toxicity, health effects, first aid, reactivity, storage, disposal,
53 personal protective equipment and spill handling procedures. As 'controlled substances' each

1 pesticide must have a *MSDS*.

2 [14]

3

4 **(322)matrix**

5 Components of the sample other than the analyte (e.g. the material or component sampled
6 for

7 *pesticide residue* studies).

8 After [3]

9

10 **(323)Maximum permissible daily dose**

11 Maximum daily dose of substance whose penetration into a human body during a lifetime will
12 not cause diseases or health hazards that can be detected by current investigation methods
13 and will not adversely affect future generations.

14 NOAEL.

15 [3]

16 See also *no-observable-adverse-effect-level, NOAEL*

17

18 **(324)maximum residue limit (MRL)**

19 Maximum concentration of a residue that is legally permitted or recognised as acceptable in,
20 or on, a food, agricultural commodity or animal feedstuff as set by Codex or a national
21 regulatory authority. The term *tolerance* used in some countries is, in most instances,
22 synonymous with MRL. Normally expressed as mg/kg fresh weight for food commodities and
23 as mg/kg dry weight for animal feedstuffs.

24 [37]

25 See also, *Codex MRL*.

26

27 **(325)maximum tolerated dose (MTD)**

28 Highest dose of a pesticide in chronic toxicity testing that is expected on the basis of an
29 adequate subchronic study to produce limited toxicity when administered for the duration of a
30 test period. It should not induce (a) overt toxicity, e.g., cell death or organ dysfunction, (b) toxic
31 manifestations that are predicted materially to reduce the life span of the organism, or (c) 10%
32 or greater retardation of body weight gain as compared with control animals.

33 After [6]

34

35 **(326)median effective concentration (EC 50)**

36 Statistically derived concentration of a pesticide in an environmental medium expected to
37 produce a certain effect in 50% of the test organisms in a given population under defined
38 conditions.

39 [4]

40

41

42

43

44 **(327)median lethal concentration (LC 50)**

45 Statistically derived concentration of a pesticide in an environmental medium expected to kill
46 50% of test organisms in a given population under defined conditions.

47 [6]

48

49 **(328)median lethal dose (LD 50)**

50 Statistically derived *dose* of a pesticide expected to kill 50% of test organisms in a given
51 population under a defined set of conditions. Normally expressed as mg of test material per
52 kg of body weight of the organism.

53 From[6]

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(329)medium

Material (e.g., air, water, soil, food, consumer products) surrounding or containing a pesticide or agent.
[15]

(330)mesocosm

See *model ecosystem*.

(331)metabolism

1. The entire physical and chemical processes involved in the maintenance and reproduction of life in which nutrients are broken down to generate energy and to give simpler molecules (*catabolism*) which by themselves may be used to form more complex molecules (*anabolism*). In case of *heterotrophic organisms*, the energy evolving from catabolic processes is made available for use by the organism.

[3]

2. Sum total of all physical and chemical processes that take place within an organism; in a narrower sense, the physical and chemical changes that occur for a pesticide within an organism. It includes uptake and distribution within the body, changes (*biodegradation*), and elimination of pesticides and their metabolites.

[6]

(332)metabolite Any intermediate or product resulting from *metabolism*.

[6]

(333)microbial pesticide

Microorganism that is used to control a pest.

[23]

(334)microcapsule suspension

Suspension in which the solid particles consist of the *active ingredient(s)* within microcapsules that allow a slow release of the active ingredient(s).

(335)microcosm

See *model ecosystem*.

(336)Micro-environment

Surroundings that can be treated as homogeneous or well characterized in the concentrations of a pesticide or other agent (e.g., home, office, automobile, kitchen, store). This term is generally used for estimating exposure.

[15] .

(337)mineralisation

Conversion of an element from an organic form to an inorganic form. Mineralisation of pesticides most commonly refers to the microbial degradation to carbon dioxide as a terminal metabolite.

See also *immobilisation*.

(338)Minor consumption crop

Crop which makes a *minor* or negligible contribution to the total dietary intake of a given,

1 identified population.

2

3 **(339)Minor use crop**

4 Crop which is grown on a small area and therefore uses too small amounts of pesticides to
5 justify registration.

6

7 **(340)Miticide**

8 *Pesticide* used for the control of *mites*.

9

10 **(341)Mitosis inhibitors**

11 Herbicidal inhibitors that disrupt cell division in germinating plant seedlings. They can act by
12 interfering with the organization of microtubules necessary in the formation of mitotic spindles
13 along which chromosomes separate during mitotic cell division. Affected tissues have cells in
14 which mitosis has been arrested at various stages as well as cells with micro-nuclei or cells
15 with two or more nuclei in which new cell wall formation has been disrupted. Herbicides

16 known

17 to have this mode of action include the dinitroanilines (e.g., trifluralin, pendimethalin),
18 pyridines

19 (e.g., dithiopyr and thiazopyr), and benzamides (e.g., tebutam).

20 [9]

21

22 **(342)Mode of pesticide action**

23 Biochemical effect that occurs at the lowest dose or concentration and/or is the earliest
24 among a number of biochemical effects that could, understandably, lead to the death of
25 the pest.

26 *Note:* Numerous modes of pesticide action are described in the alphabetical list.

27

28 **(343)model**

29 Experimental or mathematical simulation of chemical or biological behaviour in a specific
30 environment.

31 [38]

32

33 **(344)model calibration**

34 Testing of a model with known input and output information for adjustment or estimation of
35 factors for which data are not available.

36 [38]

37

38 **(345)model (computer)**

39 Assembly of numerical techniques (algorithms), bookkeeping, and control language (i.e.
40 The computer program) comprising a mathematical model and which carries out acceptance
41 of input data and instructions through to delivery of output.

42 After [38]

43

44 **(346)model (conceptual)**

45 Qualitative depiction of a specific environment that describes the linkages between the
46 different compartments. A *conceptual model* is required before a quantitative simulation

47

48

49 model can be developed.

50 [39]

51

52 **(347)model ecosystem**

1 Man-made study system containing associated organism and abiotic components that is
2 large
3 enough to be representative of a natural *ecosystem*, yet small enough to be experimentally
4 manipulated. There is some subjective differentiation between larger, outdoor *model*
5 *ecosystems* (mesocosms) and smaller, generally indoor *model ecosystems* (microcosms).

6
7 **(348)model validation**

8 Comparison of model results with numerical data independently derived from experiments or
9 observations of the environment.

10 [38]

11
12 **(349)model verification**

13 Examination of the numerical technique in the computer code to ascertain that it truly
14 represents the conceptual model and that there are no inherent numerical problems with
15 obtaining a solution.

16 [38]

17
18 **(350)Molluscicide**

19 *Pesticide* used for the control of snails, slugs and other *molluscs*.

20
21 **(351)monoclonal antibodies(Mabs)**

22 Single species of immunoglobulin molecules produced by culturing a single clone of a
23 hybridoma cell. *Mabs* recognize only one chemical structure, i.e. they are directed against a
24 single epitope of the antigenic substance used to raise the antibody.

25 [3]

26 *Note: Mabs* are commonly used in immunoassays (e.g. ELISA test kits) to identify and
27 characterize pesticide residues or metabolites within complex matrices (e.g.
28 groundwater, soil, etc.).

29
30 **(352)multi-residue method**

31 Analytical method designed to effectively determine a number of pesticide residues
32 simultaneously.

33
34 **(353)multiple resistance**

35 Situation in which two or more mechanisms of resistance to pesticides are present in an
36 organism.

37
38 **(354)Multi-site fungicides**

39 A number of fungicides, including the thiocarbamates (e.g. thiram, nabam), the phthalimides
40 (e.g. captan, difolatan) as well as chlorothalonil are potent inhibitors of numerous enzymes in
41 fungal spores with exposed thiol (-SH) groups. This property gives them excellent 'protectant'
42 activity on leaf surfaces with a low probability for fungal pathogens to develop resistance

43 [40]

44
45 **(355)mutagen**

46 Agent that can induce heritable changes (mutations) of the genotype in a cell as a
47 consequence of alterations or loss of genetic material.

48 [6]

49
50
51
52 **(356)Mycotoxin**

1 A toxin produced by a fungus under special conditions of moisture and temperature.
2 Mycotoxins are common contaminants of harvested food and feed crops which can have
3 dramatic adverse effects on humans and animals.

4
5 **(357)National estimated daily intake (NEDI)**

6 Prediction of the daily intake of a pesticide residue which is based on the most realistic
7 estimate of residue levels in food and the best available data on food consumption for a
8 specific population.

9 [28]

10
11 **(358)nebulisation**

12 Formation of an aerosol of very small liquid particles (fog) or solid particles (smoke) from a
13 pesticide formulation, generally for fumigation of an enclosed space such as a glass-house.

14
15 **(359)necrosis**

16 Sum of morphological changes resulting from cell death by lysis and/or enzymatic
17 degradation,
18 usually affecting groups of cells in a tissue.

19 [3]

20
21 **(360)negative cross-resistance**

22 The situation where one organism or biotype is more sensitive than the wild type to two or
23 more pesticides due to a single mechanism.

24
25 **(361)Negative resistance**

26 The situation where one organism or biotype is more sensitive than the wild type to a given
27 pesticide.

28
29 **(362)Nematicide**

30 *Pesticide* used for the control of *nematodes* (roundworms).

31
32 **(363)NMR**

33 Nuclear magnetic resonance spectroscopy.

34
35 **(364)non-target organism**

36 Organism affected by a pesticide or exposed to a pesticide although not an intended object of
37 its use.

38
39 **(365)no-observed-adverse-effect-level, (NOAEL)**

40 Greatest *concentration* of a pesticide or agent, found by experiment or observation, which
41 causes no detectable adverse alteration of morphology, functional capacity, growth,
42 development, or life span of the target organism under defined conditions of exposure.

43 [6]

44
45 **(366)no-observable-effect-concentration/ level (NOEC/NOEL)**

46 Greatest concentration or amount of a substance, found by experiment or observation, that
47 causes no alterations of morphology, functional capacity, growth, development, or life span of
48 target organisms distinguishable from those observed in normal (control) organisms of the
49 same species and strain under the same defined conditions of exposure.

50 [3]

1
2 **(367)Non-selective herbicide**

3 Herbicide that is generally toxic to all plants treated. Some *selective* herbicides may become
4 *non-selective* when used at very high rates.

5 [12]

6
7 **(368)Non-target species**

8 See non-target organism.

9
10 **(369)NPD**

11 Nitrogen-phosphorus detector for gas chromatography.

12 See also *thermionic detector(TID)*

13
14 **(370)octanol/water partition coefficient (K_{ow})**

15 *Partition coefficient* for a pesticide in the two-phase system octan-1-ol / water. The K_{ow} is a
16 distribution coefficient reflecting the relative *lipophilicity* of a pesticide and its potential for
17 *bioconcentration*.

18
19 **(371)Oncogenic**

20 Capable of producing tumors in animals, either benign (non-cancerous) or malignant
21 (cancerous).

22 [12]

23
24 **(372)Organochlorine pesticide(OC)**

25 Generic term for pesticides containing chlorine but commonly used to refer to older persistent
26 materials including aldrin, BHC, chlordane, DDT, dieldrin, heptachlor, lindane and toxaphene.

27
28 **(373)Organophosphorus pesticide(OP)**

29 Generic term for pesticides containing phosphorus but commonly used to refer to insecticides
30 consisting of cholinesterase inhibiting esters of phosphate or thiophosphate including
31 parathion, chlorpyrifos, diazinon, and malathion.

32
33 **(374)Organically grown**

34 Food, feed crops, and livestock grown within an intentionally-diversified, self-sustaining agro-
35 ecosystem. In practice, farmers build up nutrients in the soil using compost, agricultural
36 wastes, and cover crops instead of synthetically derived fertilizers to increase productivity,
37 rotate crops, weed mechanically, and reduce dramatically their dependence on the entire
38 family of pesticides. Farmers must be certified to characterize crops as organically grown and
39 can only use approved natural and synthetic biochemicals, agents, and materials for three
40 consecutive years prior to harvest. Livestock must be fed a diet that includes grains and
41 forages that have been organically grown and cannot receive hormones, sub-therapeutic
42 antibiotics, or other growth promoters,

43 [30]

44
45 **(375)Overtop application**

46 Broadcast or banded treatment, applied over the canopy of crops such as by airplane or by a
47 raised spray boom of ground equipment.

48 [12]

49
50 **(376)Oxidative phosphorylation uncoupler**

51 In most biological systems, the oxidation process is “coupled” with the process of
52 phosphorylation and ATP production on the inner side of mitochondrial membranes
53 Pesticides that “uncouple” this process destroy the integrity of these membranes and protons

1
2
3 leak back into the matrix of the mitochondrion without passing through an ATP synthase
4 system. Dinitrophenol herbicides, insecticides and fungicides as well as the herbicide,
5 bromoxynil, are examples of pesticides that have this mode of action.

6 [41]

7
8 **(377)partition coefficient**

9 Ratio of the concentrations of a substance in solution in two phases which are in equilibrium.
10 See *K_{oc}*, *P_{ow}*.

11
12 **(378)parts per billion (ppb)**

13 Ratio of amounts expressed as parts pesticide per 10⁹ sample. Strictly, the quantities should
14 be the same i.e. weight to weight (solids) or volume to volume (liquids or gases) e.g., 1ppb = 1
15 µg/kg. A common usage is for weight to volume but to avoid confusion it is recommended

16 that
17 the SI units are used rather than ppb.

18 [42]

19
20 **(379)parts per million (ppm)**

21 Ratio of amounts expressed as parts pesticide per 10⁶ sample e.g., 1ppm = 1mg/kg. As with
22 *ppb* it is recommended that SI units are used rather than ppm, particularly for weights to
23 volume.

24
25 **(380)Pathogen**

26 Disease-causing agent, usually applying to living organisms

27 [10]

28
29 **(381)Pelleted formulation** Dry pesticide formulation consisting of discrete particles usually
30 larger than 10 µm³ and designed to be applied without a liquid carrier.

31 [10]

32
33 **(382)persistence**

34 Residence time of a chemical species (pesticide and/or metabolites) subjected to
35 degradation

36 or physical removal in a soil, crop, animal or other defined environmental *compartment*.

37
38 **(383)Persistent organic pollutant (POP)**

39 Chemicals, including pesticides and industrial chemicals, scheduled to be eliminated from
40 world-wide use by the United Nations because of their adverse human and ecological risks
41 and their persistence and bioaccumulation in the environment. Chemicals on the list include
42 aldrin, chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene,
43 polychlorinated biphenyls and DDT.

44 [43]

45
46 **(384)Personal protective equipment (PPE)**

47 Equipment designed to be worn or held by a worker to protect against hazards posed by
48 pesticide exposure e.g. gloves, boots, aprons, coveralls, and respirators.

49
50 **(385)pest**

51 Organism that attacks food and other materials essential to mankind, or otherwise affect
52 human beings adversely.

53 After [4]

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(386)pesticide

1. Strictly, a substance intended to kill pests: in common usage, any substance used for controlling, preventing, or destroying animal, microbiological or plant pests.

[3]

2. Substance or mixture of substances intended for preventing, destroying or controlling any *pest*, including vectors of human or animal disease, unwanted species of plants or animals causing harm or otherwise interfering with the production, processing, storage, transport, or marketing of food, agricultural commodities, wood, wood products or animal feedstuffs, or which may be administered to animals for the control of insects, mites/spider mites or other pests in or on their bodies. The term includes substances intended for use as a plant growth regulator, defoliant, desiccant, or agent for thinning fruit or preventing the premature fall of fruit, and substances applied to crops either before or after harvest to protect the commodity from deterioration during storage or transport.

[4]

See also *agrochemical, plant protection agent*.

The following types of pesticides are named according to their target species:

<u>Class</u>	<u>Pest organism</u>
acaricide	mites, ticks]
algaecide	algae
antifouling point	barnacles, molluscs
avicide	birds
bactericide	bacteria
defoliant	unwanted plant foliage
desiccant	unwanted crop foliage
fungicide	fungi
graminicide	weedy grasses
growth regulator	insect or plant growth
herbicide	weeds
insecticide	insects
miticide	mites
moluscicide	snails, slugs
nematicide	nematodes
piscicide	fish
repellents	insects, birds, other vertebrates
rodenticide	mice, rats, other rodents
slimicide	slime molds
virucides	viruses

(387)pesticide chemical name

Scientific name of a pesticide following the recommendations of IUPAC for naming of chemical compounds or other accepted naming convention (e.g., Chemical Abstracts).

(388)pesticide common name

Simple name assigned to a pesticide active ingredient by the International Organisation for

1 Standardisation (ISO) to be used as a generic or non-proprietary name.

2 From [44]

3
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7
8 **(389)pesticide formulation**

9 Pesticide product offered for sale. It generally comprises *active ingredient(s)*, *adjuvant(s)* and
10 other *formulants* combined to render the product useful and effective for the purpose claimed.

11 From [44]

12
13 **(390)pesticide residue**

14 Substance(s) which remains in or on a feed or food commodity, soil, air or water following
15 use

16 of a pesticide. For regulatory purposes it includes the parent compound and any specified
17 derivatives such as degradation and conversion products, metabolites and impurities
18 considered to be of toxicological significance.

19 [44]

20 See also *residue*

21
22 **(391)pesticide residue enforcement**

23 *Pesticide residue monitoring* program where the intention is regulatory action against non-
24 complying consignments.

25
26 **(392)pesticide residue monitoring**

27 Sampling and analyses of pesticide residues in biological and environmental samples taken
28 according to pre-arranged schedules.

29
30 **(393)pesticide trade name**

31 Proprietary name assigned to a pesticide or its formulations by the company manufacturing
32 or

33 selling it. In some jurisdictions, pesticide trade names attain legal (registered trade mark)
34 status.

35
36 **(394)pH**

37 Measure of acidity or alkalinity of an aqueous solution. from 0-14. Neutral solutions have a pH
38 of 7; solutions with a pH less than 7 are acid, solutions with a pH greater than 7 are basic or
39 alkaline. Typical natural waters and soil waters have a pH between 4 and 9.

40 From[26]with modification

41
42 **(395)pharmacodynamics**

43 Process of interactions of pharmacologically active substances with *target* sites in living
44 systems, and the biochemical and physiological consequences leading to therapeutic or
45 adverse effects.

46 [6]

47
48 **(396)pharmacokinetics**

49 1. Process of the uptake of pesticides or other agents, by the body, the biotransformations
50 (metabolites) they undergo, the distribution of the parent compounds and/or metabolites in
51 the tissues, and their elimination from the body over a period of time.

52 2. Study of such processes.

53 After [6]

1
2 **(397)phase I metabolism**

3 Enzymatic modification of a pesticide or other xenobiotic by oxidation, reduction, hydrolysis,
4 hydration, dehydrochlorination or other reactions catalyzed by enzymes within the cytoplasm
5 or in various organelles of the cell.

6 From [6] with modification
7
8
9
10

11 **(398)phase II metabolism**

12 Biotransformation where the pesticide or phase I metabolite is *conjugated* with a naturally
13 occurring compound (e.g., sugars, glutathione) that increases its water solubility and
14 facilitates

15 its compartmentalization within the cell or its removal from the organism.
16

17 **(399)Pheromone**

18 1. Substance used in olfactory communication between organisms of the same species
19 eliciting a change in sexual or social behaviour.

20 [3]

21 2. A subgroup of semiochemicals that affect behaviour between members of the same
22 species. In insects, these are predominantly mixtures of straight-chain unsaturated aliphatic
23 alcohols, aldehydes and esters

24 [32]
25

26 **(400)Phloem**

27 Living tissue in plants that functions primarily to transport metabolic compounds from the site
28 of synthesis to the sites of storage and/or utilization.

29 [12]
30

31 **(401)photolysis**

32 Cleavage of one or more covalent bonds in a molecular entity resulting from absorption of
33 light, or a photochemical process in which such cleavage is an essential part.

34 [3]
35

36 **(402)Photosynthesis**

37 Metabolic process involving plants and some types of bacteria in which light energy absorbed
38 by chlorophyll and other photosynthetic pigments results in the reduction of carbon dioxide
39 followed by the formation of organic compounds. In plants the overall process involves the
40 conversion of carbon dioxide and water to carbohydrates and the release of oxygen.

41 [3]
42

43 **(403)Photosystem II inhibitor**

44 *Photosystem II* is the series of photo-induced electron transport and phosphorylation
45 reactions in which light energy absorbed by chlorophylls in plants is first converted to the
46 energy

47 of excited electrons and ultimately to ATP and reduced pyridine dinucleotides (e.g., NADPH)
48 which are essential for the reduction of carbon dioxide and the biosynthesis of carbohydrates
49 in plants. Oxidized chlorophyll molecules are restored by electrons generated by the cleavage
50 of water molecules, a reaction that also leads to the evolution of oxygen. A large number of
51 herbicides including the phenylureas (e.g., diuron, linuron), triazines (e.g., atrazine and
52 simazine), uracils (e.g., bromacil), anilides (e.g., propanil) are known to inhibit *Photosystem II*
53 in plants.

1 From [9, 41] with modification

2
3 **(404)Phototoxicity**

4 Toxicity resulting from exposure to a photosensitising agent followed by exposure to sunlight.

5
6 **(405)Phytoalexin**

7 Chemical produced by the host plant that inhibits the growth of a pathogenic fungus.

8 [17]

9
10
11
12
13 **(406)Phytotoxicity**

14 Injurious or lethal to plants.

15 [12]

16
17
18 **(407)Piscicide**

19 *Pesticide* used for the control of fish.

20
21 **(408)pKa**

22 The negative of the base-10 logarithm of the acid dissociation equilibrium constant, K_a , of a
23 compound.

24 *Note:* The smaller the number, the more acidic the compound.

25
26 **(409)pKb**

27 The negative of the base-10 logarithm of the basic reaction equilibrium constant of a
28 compound.

29 *Note:* The lower the number, the more basic (alkaline), the compound.

30
31 **(410)plant growth regulator (PGR)**

32 Natural or synthetic substance used for controlling or modifying plant growth processes
33 without

34 reducing nutritive value or causing severe phytotoxicity.

35 After [12]

36
37 **(411)plant protection agent** Pesticide product intended for use in agriculture to protect
38 crops.

39
40 **(412)Plant protection product**

41 Active substances and preparations containing one or more active substances, put up in the
42 form in which they are supplied to the user, intended to (a)protect plants or plant products
43 against all harmful organisms or prevent the action of such organisms, (b)influence the life
44 processes of plants, other than as nutrients (e.g., plant growth regulators), preserve plant
45 products, destroy undesired plants (e.g., herbicides), or destroy parts of plants, check or
46 prevent undesired growth of plants.

47 [45]

48
49 **(413)pollutant**

50 Undesirable substance introduced into a solid, liquid or gaseous environmental medium
51 totally

52 or partially by human activities.

1 [4]

2 See also contaminant.

3

4 **(414)POP**

5 See *persistent organic pollutant*

6

7 **(415)population**

8 Assemblage of individual organisms of defined ages and growth stages belonging to one
9 species within a specified location in space and time.

10 [22]

11

12 **(416)post-emergence treatment (POST)**

13 Applied after emergence of the specified weed or crop.

14 [12]

15

16

17

18 **(417)potentiation**

19 Ability of a substance to increase the toxic effect(s) of another compound.

20 [10]

21

22 **(418)precipitation**

23 1. Sedimentation of a solid material (a precipitate) from a liquid solution in which the material
24 is present in amounts greater than its solubility in the liquid.

25 [3]

26 2. Chemical precipitation: Chemical process in which a chemical in solution reacts with
27 another

28 chemical introduced to that solution to form a third substance which is partially or mainly
29 insoluble and therefore appears as an insoluble solid.

30

31 **(419)precision**

32 Closeness of agreement between independent test results obtained by applying the
33 experimental procedure under stipulated conditions. The smaller the random part of the
34 experimental errors which affect the results, the more precise the procedure.

35 Note. *Precision* is sometimes misused for *accuracy*. This problem will be avoided if one
36 recognizes that *precision* relates only to dispersion, not to deviation from the
37 (conventional) true value. Imprecision has been defined as 'standard error of the
38 reported value.'

39 [3]

40

41 **(420)predicted environmental concentration (PEC)**

42 See *estimated environmental concentration*.

43

44 **(421)predicted no effect concentration (PNEC)**

45 Estimated *no-observable effect concentration* for an aquatic species of ecosystem based on
46 extrapolated experimental exposure / response data.

47

48 **(422)pre-emergence**

49 Period before a specified crop or pest has emerged.

50 [12]

51

52 **(423)Pre-emergence treatment (PRE)**

53 Pesticide applied before the emergence of the specified crop or weed, Generally applied to

1 timing of herbicide applications.

2 [12]

3
4 **(424)preferential flow**

5 *Leaching* phenomenon whereby water and a dissolved pesticide percolating down through
6 the
7 soil profile move more rapidly through soil macropores or sand/gravel lens than through the
8 network of smaller pores in the bulk soil.

9
10 **(425)pre-harvest interval (PHI)**

11 Time interval in days between the last application of a pesticide to a crop and harvest to meet
12 the relevant *MRLs* for a particular crop.

13
14 **(426)Pre-plant incorporated treatment (PPI)**

15 Pesticide applied and blended into the soil before seeding or transplanting the crop. Usually
16 by
17 tillage.

18 [12]

19
20
21
22 **(427)Primary feed commodity**

23 Product in or nearly in its natural state intended for sale to: the stock farmer as feed which is
24 used without further processing for livestock animals or after silaging or similar farm
25 processes; or the animal feed industry as a raw material for preparing compounded feeds
26 (used for the purpose of Codex Alimentarius).

27 [13]

28
29 **(428)Primary food commodity**

30 Product in or nearly in its natural state intended for processing into food for sale to the
31 consumer or as a food without further processing. It includes irradiated primary food
32 commodities and products after removal of certain parts of the plant or parts of animal tissue.
33 Also known as a raw agricultural commodity

34 [13]

35
36 **(429)primary sample**

37 Collection of one or more increments or units initially taken from a population.

38 *Note.* Portions may be combined (*composited* or *aggregated sample*) or kept separate.

39 [29]

40
41 **(430)prior informed consent (PIC)**

42 Agreement of the designated national authority in a participating country required before
43 international shipment of a banned or severely restricted chemical can proceed for the
44 purpose of protecting human health or the environment.

45 From [44] with modification.

46
47 **(431)processed food**

48 Product resulting from the application of physical, chemical or biological processes, or
49 combinations of these (e.g., canning), to a primary food commodity, and intended for sale to
50 the consumer, for use as an ingredient in the manufacture of a food product or for further
51 processing.

52
53 **(432)Processing factor**

1 Residue level of a specific pesticide in the processed product divided by the residue level in
2 the starting commodity, usually a *raw agricultural commodity*(RAC). Processing factor =
3 residue level (mg/kg) in processed product/ residue level (mg/kg) in RAC.

4 *Note:* Alternative terms sometimes used for processing factor are “concentration factor”
5 when residue levels increase and “reduction factor” (inverse of processing factor)
6 when residue levels decrease.

7 [16]

8 9 **(433)Product stewardship**

10 Responsible and ethical pro-active management of a product during manufacturing, storage,
11 distribution, use and disposal

12 13 **(434)Pro-pesticide**

14 A chemical that in the present structure is not active as a pesticide and should become active
15 once it enters an organism and undergoes a chemical modification.

16 17 **(435)Prophylactic application**

18 Preventive application

19 20 21 22 23 **(436)protoporphyrinogen oxidase (PPO) inhibitors**

24 The enzyme PPO catalyses the last step in the synthesis of chlorophyll and haeme. Its
25 inhibition causes the accumulation of high levels of chlorophyll precursors that lead to the
26 generation of highly reactive oxygen radicals in the cytosol. The plasma membrane is
27 destroyed and cells die. Herbicidal inhibitors include the aryltetrahydrophthalimides (e.g.,
28 oxadiazon and flumioxazin), the diphenylethers (e.g., oxyfluorfen), the phenylpyrazoles (e.g.,
29 fluazolate), the thiazoles (e.g., thidiazimin), the oxadiazoles (e.g., oxadiazon), the triazolinones
30 (e.g., azafenidin) and oxazolidinediones (e.g., pentoxazone).

31 From [9] with modification.

32 33 **(437)Pyrethroid insecticide**

34 Synthetic analogue (often modified by the addition of halogens) of natural pyrethrin
35 insecticides including permethrin, cypermethrin, deltamethrin and a number of others.

36 37 **(438)Quality assurance**

38 Guarantee that the quality of a product (analytical data set etc.) is actually what is claimed on
39 the basis of the quality control applied in creating that product. *Quality assurance* is not
40 synonymous with *quality control*, it is meant to protect against failures of *quality control*.

41 [3]

42 43 **(439)Quality control**

44 1. Maintenance and statement of the quality of a product (data set, etc.) specifically that it
45 meets or exceeds some minimum standard based on known, testable criteria.

46 [3]

47 2. A system of procedures, checks, audits and corrective actions to ensure that all technical,
48 operational, monitoring, and reporting activities are of the highest achievable quality.

49 [30]

50 51 **(440)quantitative structure-activity relationship (QSAR)**

52 Building of structure-biological activity models by using regression analysis with
53 physicochemical constants, indicator variables or theoretical calculations. The term has been

1 extended by some authors to include chemical reactivity, i.e. activity is regarded as
2 synonymous with reactivity. This extension is however, discouraged.

3 [3]

4
5 **(441) Racemate**

6 An equimolar mixture of a pair of *enantiomers*. It does not exhibit *optical activity*. The
7 chemical name or formula of a racemate is distinguished from those of the enantiomers by
8 the

9 prefix (+/-) or by the symbols *RS* or *SR*.

10 [3]

11
12 **(442) Radiolabelled pesticide**

13 Pesticide '*labelled*' with a radioactive isotope that can be followed or detected in an intact
14 organism, excised tissue or other abiotic degradation tests.

15 *Note:* Studies may also be carried out using pesticides containing a 'stable' isotope e.g.

16 deuterium. Stable isotopes are often used as internal standards in analytical studies.

17
18
19 **(443) random sample**

20 Sub-set of a sampling population that is arrived at by selecting units such that each possible
21 unit has a fixed and determinate probability of selection.

22
23
24
25
26 **(444) raw agricultural commodity (RAC)**

27 Part of a crop used as a food or feed commodity directly from the harvested crop without
28 *processing*.

29
30 **(445) raw data**

31 All original laboratory records and documentation, or verified copies thereof, including data
32 directly entered in a computer. They are the results from the original activities and
33 observations in a *GLP study*.

34
35 **(446) reagent purity**

36 *Reagent grade chemicals* are those that conform to the *purity* specifications of the Committee
37 on Analytical Reagents of the American Chemical Society where such specifications are
38 available. Whenever possible only reagents of approved purity should be used in studies with
39 pesticides.

40
41 **(447) recovery**

- 42 1. In toxicology, the process leading to partial or complete restoration of a cell, tissue, organ,
43 or organism following its damage from exposure to a harmful substance or agent.
44 2. In analytical and preparative chemistry, the fraction of the total quantity of a substance
45 recoverable following a chemical or physical process.

46 After [3]

47
48 **(448) redox potential**

49 Electrical potential indicating the relative activity of oxidised and reduced species. The redox
50 potential of an environmental matrix is a measure of the extent to which oxidising species are
51 present to act as terminal electron acceptors in *respiration*.

52
53 **(449) Reduced risk pesticide**

1 Pesticide product, the use of which, in comparison with generally available products, yields
2 comparatively lower risks to human health and/or the environment.

3
4 **(450)re-entry interval**

5 Minimum time between pesticide application and human re-entry to a treated area.
6 Established by a regulatory authority to assure safety of workers from exposure to residues.

7
8 **(451)reference dose (RfD)**

9 Estimate (with uncertainty spanning perhaps an order of magnitude) of a daily *exposure*
10 (mg/kg body weight/day) for a pesticide in the human population (including sensitive
11 subgroups) that is likely to be without appreciable *risk* of deleterious effects during a lifetime.

12 [6]

13 See also *acceptable daily intake, ADI*.

14
15 **(452)reference material**

16 Material or substance containing pesticide of interest at levels sufficiently homogenous and
17 well characterised to be used for the calibration of an apparatus or assessment of analytical
18 method performance.

19 After [26]

20 See also *certified reference material*.

21
22 **(453)registration**

23 Process whereby the responsible national, provincial or state government authority approves
24

25
26
27 the sale and use of a pesticide following the evaluation of scientific data demonstrating that
28 the pesticide is effective for the purposes intended and not unduly hazardous to human or
29 animal health or the environment.

30 [44]

31
32 **(454)Registration number**

33 Distinct number (e.g. four or five digits) assigned to each registered pest control product
34 within

35 a specific country. Unless expressly exempt by regulation under local regulations, all pest
36 control products must be registered and be issued a registration number before being
37 permitted for sale, import or use in a given country

38 [14, 33]

39
40 **(455)Registrant**

41 Organization or individual that holds the certificate of registration and is thereby responsible
42 for

43 a given pesticide product. A *registrant* can be a chemical company, government agency,
44 importer or any person wishing to market a pest control product within a given jurisdiction.

45 The

46 registrant's name and address must appear on the product label as a legal requirement.

47
48 **(456)regulatory method**

49 Validated analytical method which can be applied using commonly available laboratory
50 equipment and instrumentation. A regulatory method has the precision, specificity, limit of
51 determination, etc, needed to test compliance with the regulations.

52
53 **(457)relative risk**

1 Ratio of the risk of disease or death among the exposed to the risk among the unexposed.
2 [6, 46]

3 *Note:* The term is also used for comparing the risks of various stressors and management
4 actions

5
6 **(458)repeatability**

7 Closeness of agreement between independent results obtained with the same method on
8 identical test material, under the same conditions (same operator, same apparatus, same
9 laboratory and after short intervals of time). The *measure of repeatability* is the standard
10 deviation. In some contexts, repeatability may be defined as the value below which the
11 absolute difference between two single test results obtained under the above conditions, may
12 be expected to lie within a specified probability.

13 [3]

14
15 **(459)Repellent**

16 Chemical or substance that causes insects, undesirable birds or other pests to *avert* or *avoid*
17 contact with humans, domestic animals or desirable plants.

18
19 **(460)reproducibility**

20 Closeness of agreement between independent results obtained with the same method on
21 identical test material but under different conditions (different operators, different apparatus,
22 different laboratories and/or after different intervals of time). The *measure of reproducibility* is
23 the standard deviation qualified with the term '*reproducibility*' as *reproducibility standard*
24 *deviation*. In some contexts, *reproducibility* may be defined as the value below which the
25 absolute difference between two single test results on identical material obtained under the
26 above conditions, may be expected to lie within a specified probability. Note that a complete
27 statement of reproducibility requires specification of the experimental conditions which differ.

28 [3]

29
30
31 **(461)Residue**

32 Specified substances in or on food, agricultural commodities or animal feed resulting from the
33 use of a pesticide. The term includes any derivatives of a pesticide, such as conversion
34 products, metabolites, reaction products and impurities considered to be of toxicological
35 significance. *Pesticide residue* includes residues from unknown or unavoidable sources as
36 well
37 as from known uses of the chemical.

38 [36]

39
40 **(462)Residue of concern (ROC)**

41 Identified pesticide residue (e.g. either parent molecule or metabolite) that represents the
42 moiety which has the greatest potential to accumulate or result in the greatest toxicological
43 concern in harvested food/feed.

44
45 **(463)resistance**

46 Inheritable ability of some pest biotypes within a given population to survive a pesticide
47 treatment that should, under normal use conditions, effectively control populations of that
48 pest.

49
50 **(464)Resistance management**

51 Use of pesticides and alternate pest control measures so as to minimize or delay the
52 development of *resistance* in the target pest.

1 **(465)respiration**

2 Energy-generating process in an organism where an organic or inorganic compound serves
3 as
4 the electron donor and an inorganic compound (e.g., oxygen) serves as the electron acceptor.
5

6 **(466) Retention**

7 Proportion of pesticide, applied as a spray, that remains on plant leaves or mulch.
8

9 **(467)retention sample**

10 Sample which is stored for a specified period in case of a need for re-evaluation of data
11 obtained from the main *laboratory samples*.
12

13 **(468)Riparian zone**

14 Area adjacent to a river or stream with a high density, diversity, and productivity of plant and
15 animal species. Management of *riparian zones* is often used in agricultural regions as a
16 means
17 of protecting surface water quality from agricultural runoff. These zones act as a trap for
18 sediments and nutrients, shade streams, thereby lowering water temperature, protect stream
19 banks from collapse, reduce soil erosion and provide habitat for birds, reptiles and mammals
20 of the region.
21

22 [46]

23 **(469)risk**

24 The probability of an adverse effect in an organism, system or (sub) population caused under
25 specified circumstances by exposure to an agent.
26

27 [7]

28 **(470)risk assessment**

29 A process intended to calculate or estimate the risk to a given target organism, system or
30 (sub)

31 population, including the identification of attendant uncertainties, following exposure to a
32 particular pesticide or agent of concern as well as the characteristics of the specific target
33 system. The risk assessment process includes four steps: hazard identification, hazard
34

35
36
37 characterisation (related term: dose-response assessment), exposure assessment, and risk
38 characterization. It is the first component in a risk analysis process
39

40 [7] .

41 **(471)Risk characterization**

42 The qualitative and, wherever possible, quantitative determination, including attendant
43 uncertainties of the probability of occurrence of known and potential adverse effects of an
44 agent in a given organism, system or (sub)population, under defined exposure conditions.
45

46 [7]

47 **(472)risk management**

48 Decision-making process involving considerations of political, social, economic, and technical
49 factors with relevant risk assessment information relating to a hazard so as to develop,
50 analyse, and compare regulatory and non-regulatory options and to select and implement
51 appropriate regulatory response to that hazard. Risk management comprises three elements:
52 risk evaluation; emission and exposure control and risk monitoring.
53

[7]

1
2 **(473)Risk quotient**

3 A comparison of exposure with effects as an index to express the risk posed by a particular
4 chemical (often synonymous with hazard quotient).

5 From [49]

6 Synonym: Hazard quotient.
7

8 **(474)Route of exposure**

9 Means by which a chemical enters an organism after contact (e.g. ingestion, inhalation, or
10 dermal absorption).

11 [30]
12

13 **(475)Rodenticide**

14 *Pesticide* used for the control of mice, rats or other *rodents*.
15

16 **(476)rotational crop**

17 Crop grown in sequence of two or more different crops.
18

19 **(477)run-off**

20 1. Transport of water and sediment from the surface of an agricultural field to a non-target
21 area such as a stream due to a precipitation event. Runoff from agricultural production
22 fields may contain residues of nutrients and pesticides that have been applied to the soil or
23 plant canopy.

24 2. Loss of a pesticide formulation off the plant foliage during spray application, particularly at
25 high volume.
26

27 **(478)safener**

28 Chemical or agent that reduces toxicity of a herbicide to a specific crop plant by a
29 physiological
30 mechanism.

31 [12]

32 See also *antidote*.
33

34 **(479)safety factor**

35 Composite (reductive) factor by which an observed or estimated no-observed-adverse effect
36 level (NOAEL) is divided to arrive at a criterion or standard that is considered safe or without
37

38 appreciable risk.
39

40 [7]
41

42 **(480)sample**

43 Portion of material selected from a larger quantity of material so that it is representative of the
44 whole. The term needs to be qualified, see also, *aggregate sample*, *aliquot*, *composite*
45 *sample*, *control sample*, *increment sample*, *laboratory sample*, *primary sample*, *random*
46 *sample*, *retention sample*, *subsample*, *test portion* and *test sample*. The term 'sample'
47 implies

48 the existence of a sampling error, i.e. the results obtained on the portions taken are only
49 estimates of the concentration of a constituent (e.g. pesticide) or the quantity of a property
50 present in the parent material. If there is no or negligible sampling error, the portion removed
51 is

52 a test portion, aliquot or specimen. The term 'specimen' is used to denote a portion taken
53 under conditions such that the sampling variability cannot be assessed (usually because the

1 population is changing), and is assumed, for convenience to be zero. The manner of selection
2 of the sample should be prescribed in a sampling plan.

3 [3]

4
5 **(481)Sample cleanup**

6 Post-extraction procedure included in an analytical method to remove potential interferents
7 from a sample extract prior to analysis.

8
9 **(482)sampling plan**

10 Predetermined procedure for the selection, collection, preservation, transportation, and
11 preparation of the portions to be removed from a population as samples.

12 [3, 29]

13
14 **(483)SAR**

15 See, *structure activity relationships* and *QSAR* as well as *systemic acquired resistance*.

16
17
18 **(484)Secondary food commodity**

19 “*Primary food commodity*” which has undergone simple processing, such as removal of
20 certain

21 portions, drying, husking and comminution, which do not basically alter the composition or
22 identity of the product. Secondary food commodities may be processed further or may be
23 used

24 as ingredients in the manufacture of food or may be sold directly to the consumer. (an
25 important term for the purposes of Codex Alimentarius, JMPR Report 1979, Annex)

26 [16]

27
28 **(485)Selective herbicide**

29 Chemical that is more toxic to some plant species than to others.

30 [12]

31
32 **(486)Semochemical**

33 Message-bearing substances produced by plants or animals, or synthetic analogues thereof,
34 that evoke a behavioural response in individuals of the same or other species (e.g. allomones,
35 kariozones, pheromones, and synomones).

36 [14]

37
38
39
40 **(487)size-exclusion chromatography (SEC)**

41 A separation technique in which separation mainly according to the hydrodynamic volume of
42 the molecules or particles takes place in a porous non-adsorbing material with pores of

43
44
45 approximately the same size as the effective dimensions in solution of the molecules to be
46 separated.

47
48 **(488)Slimeicide**

49 *Pesticide* (usually a *fungicide*) used to control a *slime mold*.

50
51 **(489)Slow-release pesticide formulation**

1 Pesticide product that releases the *active ingredient* into the environment more slowly than
2 typical solutions, emulsions or powders so that exposure of target organisms is extended over
3 a longer period.

4
5 **(490)soil incorporation**

6 Application of a pesticide to soil by mixing or injection into the soil body.

7
8 **(491)soil organic carbon partition coefficient (K_{OC})**

9 Ratio of a pesticide concentration sorbed in the organic matter component of soil or sediment
10 to that in the aqueous phase at equilibrium. The K_{OC} is calculated by dividing the K_d value by
11 the fraction organic carbon present in the soil or sediment

12 See also *soil organic matter*.

13
14 **(492)soil organic matter**

15 Organic fraction of the soil, including both fresh and aged residues (e.g., humus) of biological
16 origin. Organic carbon refers to that portion of the soil measured as carbon in organic forms,
17 and the organic matter content of soil is assumed to be approximately 1.72 times that of the
18 organic carbon content.

19
20 **(493)soil partition coefficient (K_d)**

21 Experimental ratio of a pesticide's concentration in the soil to that in the aqueous (dissolved)
22 phase at equilibrium. It is valid only for the specific concentration and solid/solution ratio of
23 the

24 test. The K_d is a distribution coefficient reflecting the relative affinity of a pesticide for
25 adsorption by soil solids and its potential for *leaching* movement through soil.

26 See also K_{OC} .

27
28 **(494)Soluble concentrate**

29 Liquid formulation that forms a solution when added to water.

30 [12]

31
32 **(495)Soluble granule**

33 Dry granular formulation that forms a solution when added to water.

34 [12]

35
36 **(496)Soluble powder**

37 Dry formulation that forms a solution when added to water.

38 [12]

39
40 **(497)Solupak**

41 Formulation of a pesticide into individual water soluble bags containing a defined active
42 ingredient weight that can be directly added to a spray mixture. A solupack formulation is
43 considered a closed system.

44
45 **(498)Solid phase extraction(SPE)**

46 Method of sample preparation that concentrates and purifies analytes from solution by

47
48
49 sorption onto a disposable solid-phase cartridge, followed by elution of the analyte with a
50 solvent appropriate for instrumental analysis.

51 [50]

52
53 **(499)SOP**

1 Standard operating procedures.

2
3 **(500)sorption**

4 Removal of pesticide from solution by soil or sediment via mechanisms of *adsorption* and
5 *absorption*.

6
7 **(501)specimens**

8 *Samples* collected from a system for examination, analysis, or storage.

9
10 **(502)spiked sample (fortified sample)**

11 *Control sample* with a known amount of pesticide added. Used to test the
12 accuracy (especially
13 the efficiency of *recovery*) of an analytical method.

14 After [29]

15
16 **(503)spray drift**

17 Downwind movement of airborne spray droplets beyond the intended area of application
18 originating from aerial or ground-based spraying operations.

19 [12]

20
21 **(504)spreader**

22 See *wetting agent*.

23
24 **(505)standard solution, primary**

25 Standard prepared by dissolving a weighed amount of an *analytical standard pesticide* in a
26 known volume of solvent.

27
28 **(506)standard solution, secondary**

29 Standard prepared by dilution of an aliquot of a *primary standard solution* with a known
30 volume

31 of solvent, or by subsequent serial dilutions; or a standard solution measured by reference to
32 a

33 *primary standard solution*.

34
35 **(507)Sterol biosynthesis inhibitors**

36 Ergosterol is a sterol of major importance in most fungi, including the *Ascomycetes*,
37 *Basidiomycetes* and *Fungi Imperfecti*. Propiconazole and other triazole *fungicides* inhibit
38 ergosterol biosynthesis in these fungi by inhibiting *Cytochrome P 450*, multifunction oxidase
39 enzymes. The lack of ergosterol, leads a loss of membrane integrity and death of the
40 organism. These fungicides are systemic and can translocate upward in plants. They also
41 have *hormonal* activity in plants and can act as growth retardants.

42 [40]

43
44 **(508)sticker**

45 *Formulant* which increases the adhesiveness of a formulation applied to a surface.

46 See also *wetting agent*.

47
48 **(509)storage stability test**

49 For a *pesticide formulation*, a test which measures the chemical and physical stability of the
50 product stored under defined, high temperature, conditions. For *pesticide residues*, a test

1 which measures stability of residues in stored analytical samples, usually held under frozen
2 conditions at a specified temperature.

3
4 **(510)structure-activity-relationship (SAR)**

5 Association between specific aspects of molecular structure of a chemical (pesticide) and
6 defined biological action.

7 After [6]

8 See also QSAR

9
10 **(511)subsample**

11 1. Portion of the *sample* obtained by selection or division;

12 2. Individual unit of the lot taken as part of the *sample*;

13 3. Final unit of multistage sampling.

14 [29]

15
16 **(512)supercritical fluid chromatography (SFC)**

17 A separation technique in which the mobile phase is a fluid above and relatively close to its
18 critical temperature and pressure. In general, the terms and definitions used in gas or liquid
19 chromatography are equally applicable to supercritical fluid chromatography.

20 [3]

21
22 **(513)Supercritical fluid extraction (SFE)**

23 Extraction of a material using a supercritical fluid. The extracted material is usually recovered
24 by reducing the temperature or pressure of the extraction fluid and allowing the volatile
25 components of the mobile phase to evaporate. It can be used either as an on-line sample
26 introduction method for a chromatographic separation or as an off-line sample preparation
27 method.

28 [51]

29
30 **(514)Surface water**

31 All water naturally open to the atmosphere (rivers, lakes, reservoirs, streams, impoundments,
32 seas, estuaries, etc.) and all springs, wells, or other collectors which are directly influenced by
33 surface water.

34 [23]

35
36 **(515)surfactant**

37 *Formulant* that improves the emulsifying, dispersing, spreading, or other properties of a liquid
38 by modifying its surface characteristics.

39 [12]

40
41 **(516)Supervised trials**

42 Scientific studies for estimating maximum residue levels in which pesticides are applied to
43 crops or animals according to specified conditions intended to reflect commercial practice
44 after

45 which harvested crops or tissues of slaughtered animals are analysed for pesticide residues.
46 Usually specified conditions are those which approximate existing or proposed "GAP".

47 [16]

48
49 **(517)Supervised trials median residue (STMR)**

50 The expected residue level (expressed in mg/kg) in the edible portion of a food commodity
51 when a pesticide has been used according to maximum GAP conditions. The STMR is
52 estimated as the median of the residue value (one from each trial) from supervised trials

1
2
3 conducted according to maximum GAP conditions.

4 [16]

5
6 **(518)Supervised trials median residue-processed (STMR-P)**

7 The expected residue in a processed commodity calculated by multiplying the STMR of the
8 *raw agricultural commodity* by the corresponding *processing factor*, or derived directly from a
9 series of processing trials. The STMR-P is expressed in units of mg/kg.

10 [16]

11
12 **(519)surveillance**

13 Systematic sampling and residue analysis of commodities, and collation and interpretation of
14 data, in order to ensure compliance with established *MRLs*. Surveillance may be directed at
15 domestic, imported or exported commodities.

16
17 **(520)Suspension concentrate (SC)**

18 Formulation in which the active ingredient is in the form of a stable dispersion of fine particles
19 in water or organic liquid.

20 [2]

21
22 **(521)Sustainable agriculture**

23 A farming system that utilizes the available earth's resources for food production without
24 depleting the resources or polluting the environment.

25
26 **(522)Symplast**

27 The total mass of continuous living cells in a plant interconnected by plasmodesmata and
28 including the phloem.

29 [12]

30
31 **(523)synergism**

32 Toxicological interaction in which the combined biological effect of two pesticides or agents is
33 greater than expected on the basis of the simple summation of the toxicity of each of the
34 individual pesticides or agents under the same conditions of exposure.

35 After [6]

36
37 **(524)synergist**

38 Substance, which at the rate applied, is formally inactive or weakly active, can significantly
39 enhance the activity of the other active ingredient in a formulation.

40
41 **(525)systemic**

42 Pesticide or substance that is capable of being translocated to sites other than where it was
43 absorbed in sufficient quantities to be biologically effective. Systemic herbicides move within
44 plants, affecting parts of a plant that weren't directly exposed at application. Systemic
45 fungicides move within plants and have toxic effects on pathogens within plant cells and
46 tissues. Systemic insecticides move within plants or in the blood stream of vertebrates to kill
47 sucking insects.

48 [10]

49
50 **(526)Systemic acquired resistance (SAR)**

51 Activation of defenses in uninfected parts of a plant. As a result, the entire plant is more
52 resistant to a secondary infection. *SAR* is long lasting and often confers broad-based

1
2
3
4 resistance to different pathogens. Salicylic acid may be a signalling compound involved
5 in transmission of the defense response throughout the plant to produce SAR
6 [52]

7
8 **(527)systemic effect**

9 Consequence that is either of a generalized nature or that occurs at a site distant from the
10 point of entry of a substance.
11 [3]

12
13 **(528)target, biological**

14 Organism, organ, tissue, cell or cell constituent, e.g. enzyme that is subject to the action of a
15 pesticide or its residue.

16
17 **(529)technical material**

18 Commercial grade of the pesticide as it comes from the manufacturing plant comprising the
19 active ingredient and associated impurities. It may also contain small quantities of additives
20 necessary for stability.

21
22 **(530)Teratogen**

23 Substance capable of producing structural abnormalities of prenatal origin, present at birth or
24 manifested shortly thereafter
25 [10]

26
27 **(531)test guideline**

28 *Guideline* published by an appropriate authority for the order or conduct of certain tests.
29

30 **(532)test portion (analytical portion)**

31 *Subsample*, of proper size for a chemical analysis or other test, removed from the *test*
32 *sample*.
33 After [29]

34
35 **(533)test sample (analytical sample)**

36 Homogenous sample, prepared from the *laboratory sample* by mixing, grinding, blending,
37 fine-
38 chopping etc., from which *test portions* are removed for analysis with minimal sampling error.
39 After [29]

40
41 **(534)test substance**

42 Pesticide as a chemical substance or mixture which is under investigation in a *GLP Study*.
43

44 **(535)test system**

45 Each system (animal, plant, microbial, other cellular, subcellular; chemical, or physical
46 combination thereof) used in a study.
47

48 **(536)theoretical maximum daily intake (TMDI)**

49 A prediction of the maximum daily intake of a pesticide residue, assuming that residues are
50 present at the *MRLs* and that average daily consumption of foods per person is represented
51 by regional diets. It is calculated for the various regional diets and it is expressed in milligrams
52 of residue per person per day.
53 [28]

1
2 **(537)Thermionic detector (TID)**

3 Gas chromatographic detector based on the phenomenon that a metal anode will emit
4 positive
5 ions when heated in a gas. A detector commonly used in gas chromatography for the
6 selective

7
8
9 determination of organic compounds containing nitrogen and phosphorous atoms. The *TID*
10 evolved from the earlier alkali flame ionisation detector (*AFID*) and is also known a nitrogen
11 and phosphorous detector (*NPD*)

12 [53]

13
14 **(538)threshold**

15 Dose or exposure concentration of a pesticide in an organism below which a stated effect is
16 not observed or expected to occur.

17 After [7]

18
19 **(539)Thin layer chromatography (TLC)**

20 *Chromatography* carried out in a layer of *adsorbent* on a support e.g. a glass plate.

21 [3]

22
23 **(540)tolerable daily intake (TDI)**

24 Analogous to Acceptable Daily Intake (ADI). The term '*Tolerable*' is used for pesticides or
25 agents which are not deliberately added, such as contaminants in food.

26 [7]

27
28 **(541)tolerance, residue**

29 See also *maximum residue limit*.

30
31 **(542)Total diet study**

32 *Pesticide residue monitoring* to establish the pattern of residue intake by a person consuming
33 a defined diet. Primary sampling is as for a *market basket survey* but the samples are further
34 processed as for domestic consumption i.e. further trimming and cooking as appropriate to
35 local practice.

36
37 **(543)Total terminal residue**

38 Summation of levels of all the compounds comprising residues of a pesticide in a food.

39 See also *pesticide residue*.

40
41 **(544)toxicology**

42 Scientific discipline involving the study of the actual or potential danger presented by the
43 harmful effects of substances on living organisms and ecosystems, of the relationship of such
44 harmful effects to exposure, and of the mechanisms of action, diagnosis, prevention and
45 treatment of intoxications.

46 [6]

47
48 **(545)Toxic equivalency factor (TEF)**

49 Ratio of the toxicity of a chemical to that of another structurally related chemical (or index
50 compound) chosen as a reference.

51
52 **(546)toxicity**

1 1. Capacity to cause injury to a living organism defined with reference to the quantity of
2 substance administered or absorbed, the way in which the substance is administered and
3 distributed in time (single or repeated doses), the type and severity of injury, the time
4 needed to produce the injury, the nature of the organism(s) affected and other relevant
5 conditions.

6 [3]

7 2. Adverse effects of a substance on a living organism defined with reference to the quantity
8 of
9 substance administered or absorbed, the way in which the substance is administered

10
11
12 (inhalation, ingestion, topical application, injection) and distributed in time (single or
13 repeated doses), the type and severity of injury, the time needed to produce the injury, the
14 nature of the organism(s) affected and other relevant conditions.

15 [3]

16 3. Measure of incompatibility of a substance with life: this quantity may be expressed as the
17 reciprocal of the absolute value of median lethal dose (1/LD 50) or concentration (1/LC 50)

18 [3]

19 4. Inherent property of an agent to cause an adverse biological effect.

20 [7]

21
22 **(547)toxicity exposure ratio (TER)**

23 Ratio of the measure of the effects (e.g., LD 50, LC 50, NOEC) to the estimated exposure.

24 Note: It is the reciprocal of a *risk quotient* or *hazard quotient*.

25
26 **(548)toxification**

27 See *bioactivation*.

28
29 **(549)transformation product**

30 Chemical species resulting from environmental, chemical or metabolic processes on a
31 pesticide.

32 See also *degradation product*, *metabolite*.

33
34 **(550)translocation**

35 Movement of a substance within the *test system* or organism.

36 Note: Most often used for plants.

37
38 **(551)transpiration**

39 Evaporation of water from a leaf into the air.

40
41 **(552)treated solution**

42 Test solution that has been subjected to reaction or separation procedures prior to
43 measurement of some property.

44
45 **(553)Transferable residue**

46 See *dislodgeable foliar residue*.

47
48 **(554)trigger value**

49 Numerical value for a property of a pesticide, set by regulatory authorities, which determines
50 the sequence and type of tests in a tiered assessment scheme.

51 See also *cut-off value*.

52
53 **(555)trophic level**

1 Functionally similar organisms such as algae and plants as primary producers are grouped
2 into trophic levels based on similarities in the patterns of food production and consumption.

3
4 **(556)ultra low volume (ULV) spray**

5 Signifies that the total volume rate of spray application is very low (5 litres per hectare or less).
6 ULV pesticide formulations are generally specially developed for the purpose and are applied
7 Undiluted.

8
9 **(557)ultraviolet absorption detector (UVD)**

10 Detector commonly used with *high performance liquid chromatography (HPLC)* for the
11 analysis

12
13
14 of organic chemicals with molecular structures containing a chromophore. It is designed to
15 measure the loss in intensity of monochromatic ultraviolet light as it passes through the
16 solution exiting an HPLC column. The loss in intensity is expressed as *Absorbance (A)* and it
17 is linear in relation to concentration as per Beer's Law: $A = \epsilon bc$. Where ϵ is molar absorptivity,
18 b is the path length of the cell and c is the concentration of the analyte.

19 From [48] with modification

20
21 **(558)uncertainty factor**

22 Reductive factor by which an observed or estimated no-observed-adverse effect level
23 (NOAEL) of a pesticide is divided to arrive at a criterion or standard that is considered safe or
24 without appreciable risk.

25 [7]

26
27 **(559)uncertainty of measurement**

28 Parameter, associated with the result of a measurement, that characterizes the dispersion of
29 the values that could reasonably be attributed to the quantity of the pesticide or agent being
30 measured.

31 After [3]

32
33 **(560)validation**

34 1. Process by which the reliability and relevance of a particular approach, method, process
35 or assessment is established for a defined purpose.

36 [7]

37 2. In pesticide residue analysis, the process for establishing that analytical methods or
38 equipment will provide reliable and reproducible results.

39
40 **(561)Vapor pressure**

41 Pressure exerted by a saturated vapor above its own liquid in a closed container. Units of
42 measure are usually, mm Hg or Pa at a temperature of 20 C unless otherwise stated.

43 [23]

44
45 **(562)vehicle**

46 See *carrier*.

47
48 **(563)Very long chain fatty acid (VLCFA's) biosynthesis inhibitors**

49 In higher plants, VLCFA's are the main constituents of hydrophobic polymers present in the
50 leaf surface lipids, storage lipids in seeds, components of membranes, etc. Most herbicidal
51 inhibitors of this process affect the fatty acid elongase enzymes (FAEs) that allow the
52 production of VLCFAs. Example herbicides include the chloroacetamides (e.g., acetochlor,
53 metolachlor), acetamides (e.g., diphenamid) oxyacetamides (e.g., flufenacet) and

1 tetrazolinones (e.g., fentrazamide).

2 [9]

3

4 **(564)Virucides**

5 Substances used for the control of viruses.

6 [14]

7

8 **(565)volatilization**

9 1. Conversion of a solid or liquid to a gas or vapour by application of heat, by reducing
10 pressure, by chemical reaction or by a combination of these processes.

11 [3]

12 2. Evaporation of pesticides during and after application.

13

14

15 **(566) Voltage dependent sodium channel blockers**

16 Insecticidal compounds that prevent closure of and prolong current flow through sodium
17 channels in peripheral, sensory, and motor nerves and in interneurons within the nervous
18 system of insects. Examples include DDT and its analogues as well as synthetic and natural
19 pyrethroids.

20 [27]

21

22 **(567)Volume median diameter (VMD)**

23 Median diameter in a distribution of spray particles such that half of the volume of spray
24 contains particles greater than the *VMD* and half the volume contains particles less than the
25 *VMD*.

26

27 **(568)watershed**

28 See *catchment*.

29

30 **(569)water dispersible granule (WG)**

31 1. Formulation containing granules which readily disperse in water to form a suspension.

32 [2]

33 2. Granular formulation, possibly in dry flowable form that forms a suspension in water for
34 application as a spray

35 [14]

36

37 **(570)water dispersible powder (WP)**

38 Pesticide in a dry form with surfactant, often mixed with, or coated on, a fine solid carrier, for
39 dispersion in water to form a suspension.

40 [2]

41

42 **(571)water soluble powder**

43 Powder formulation to be applied as a true solution of *active ingredient* after mixing with
44 water,

45 but which may contain insoluble *inert ingredients*.

46 [2]

47

48 **(572)wetable powder**

49 See *water dispersible powder*.

50

51 **(573)wetting agent**

52 *Surfactant* for use in spray formulations to assist dispersion of a powder in the *diluent* or
53 spreading of spray droplets on surfaces. May also incorporate functions of a *sticker*.

1
2 **(574)withholding period**

3 Minimum permissible time between the last application of a pesticide to a crop (including
4 pasture) and harvesting for human consumption or grazing with livestock. The minimum
5 permissible time between the final application of a pesticide to an animal and the collection of
6 eggs or milk, or slaughter, for human consumption.

7 See also *pre-harvest interval*.

8
9 **(575)Wood preservative**

10 Products applied to wood that prevent deterioration caused by various wood-destroying pests.
11 Various categories of these products are defined by their use areas, e.g. lumber-anti-sapstain,
12 pressure treatments, joinery products, ground-line treatments and stains.

13 [14]

14
15
16
17 **(576)xenobiotic substance**

18 Compound with a chemical structure foreign to a given organism.

19 *Note:* the term is normally restricted to man-made compounds.

20 [6]

21
22 **(577)xylem**

23 Part of the plant's vascular system adapted to the transport of water and solutes from the
24 roots
25 to aerial parts.

26 [12]

27
28 **(578)zero tolerance**

29 Situation in which any residues of a pesticides at or above the *limit of detection (LOD)* are
30 deemed to be illegal when no *maximum residue limits, (MRLs)*, have been established.

31
32
33
34 **ANNEX 1. LIST OF ABBREVIATIONS OF NATIONAL AND INTERNATIONAL BODIES**

35
36

37 AAEE	American Academy of Environmental Engineers
38 AOAC	Association of Official Analytical Chemists
39 APVMA	Australian Pesticides and Veterinary Medicines Authority
40 ASTM	American Society for Testing and Materials
41 BBA	Biologische Bundesanstalt fur Land und Forswirtschaft (Germany)
42 CAC	Codex Alimentarius Commission
43 CAS	Chemical Abstracts Service
44 CCPR	Codex Committee on Pesticide Residues
45 CIPAC	Collaborative International Pesticide Analytical Council
46 CLI	CropLife International
47 COLEACP	Comite de Liaison Europe, Afrique, Caribes, Pacifique
48 DG SANCO	The Health and Consumer Protection Directorate General (European 49 Commission)
50 DPR	Department of Pesticide Regulation (California, USA)
51 ECB	European Chemicals Bureau
52 ECPA	European Crop Protection Association

1	EFSA	European Food Safety Authority (European Commission)
2	EPA	Environmental Protection Agency (USA)
3	EPPO	European and Mediterranean Plant Protection Organisation
4	EUREP	Euro-Retailer Produce Working Group
5	EXTOXNET	The Extension Toxicology Network
6	FAO	Food and Agriculture Organization of the United Nations
7	GCPF	Global Crop Protection Federation
8	GEMS	Global Environmental Monitoring System
9	GIFAB	Groupement International des Associations Nationales de Fabricants de Produits Agrochimiques
10		
11	IAEA	International Atomic Energy Agency of the United Nations
12	IAPPS	International Association for the Plant Protection Sciences
13	IARC	International Agency for Research on Cancer, World Health Organization
14	INFOCRIS	Food Contaminant and Residue Information System
15	IPCS	International Programme on Chemical safety, World Health Organization
16	ISO	International Organisation for Standardisation
17		
18		
19	IUPAC	International Union of Pure and Applied Chemistry
20	JMPR	Joint FAO/WHO Meeting on Pesticide Residues
21	JMPS	FAO/WHO Meeting on Pesticide Residues
22	MAFF	Ministry of Agriculture, Forestry, and Fisheries (Japan)
23	OECD	Organisation for Economic Co-operation and Development
24	PAN	Pesticide Action Network
25	PMRA	Pest Management Regulatory Agency (Canada)
26	PSD	Pesticides Safety Directorate (UK)
27	SCFCAH	Standing Committee on the Food Chain and Animal Health (European Commission)
28		
29	SETAC	Society of Environmental Toxicology and Chemistry
30	UNEP	United Nations Environment Programme
31	USDA	United States Department of Agriculture
32	USEPA	United States Environmental Protection Agency
33	USFDA	United States Food and Drug Administration
34	WHO	World Health Organization of the United Nations
35	WHOPES	Pesticide Evaluation Scheme, World Health Organization

ANNEX 2: SOURCES

Note: This Annex lists all of the publications quoted and cited in the text as well as most of the additional glossaries that were consulted to assess current usage of the terms defined.

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