

Ornamental Glossary

Abdomen: The posterior of the three main body divisions of insects.

Abiotic: Without life or ever being alive.

Absorption: The process by which an herbicide passes from one system into another, e.g., from the soil solution into a plant root cell or from the leaf surface into the leaf cells.

Acid equivalent (ae): The theoretical yield of parent acid from a pesticide active ingredient that has been formulated as a derivative. For example, Roundup Pro contains 4 pounds per gallon of the isopropylamine salt form of glyphosate but 3 pounds per gallon of the parent acid.

Acid soil: Soil with a pH value less than 7.0.

Activation: The process by which a surface-applied herbicide is moved into the soil where it can be absorbed by emerging seedlings. This is normally accomplished by rainfall, irrigation, or tillage. Activation does not imply any chemical change in the active ingredient.

Active ingredient (ai): The chemical in an herbicide formulation primarily responsible for its phytotoxicity and which is identified as the active ingredient on the product label.

Adjuvant: Any substance in an herbicide formulation or added to the spray tank to modify herbicidal activity or application characteristics.

Adsorption: The process by which an herbicide associates with a surface, e.g., a soil colloidal surface.

Adsorption characteristics (K_{oc}): The K_{oc} describes the relative affinity or attraction of the pesticide to soil material and, therefore, its mobility in soil. Pesticides with small K_{oc} values are more likely to leach than those with high K_{oc} values.

Aestivation: Period of insect inactivity (dormancy) during the summer months.

Alkaline soil: Soil with a pH greater than 7.0.

Allelopathy: The adverse effect on the growth of plants or microorganisms caused by the

action of chemicals produced by other living or decaying plants.

Alternate host: A plant used by the pest to complete its life cycle other than the primary host. Example: One of two kinds of plants on which a parasitic fungus (e.g., rust) must develop to complete its life cycle.

Antagonism: An interaction of two or more chemicals such that the effect when combined is less than the predicted effect based on the activity of each chemical applied separately.

Anthracnose: A disease that appears as irregular dead areas on leaves and is caused by a fungus.

Asexual: Reproducing without mating (no union of sperm and egg).

Bactericide: A chemical compound that kills or inhibits bacteria.

Band treatment: Applied to a linear restricted strip on or along crop rows rather than continuous over the field area.

Bioaccumulation: The storage or accumulation of materials in the tissues of living organisms.

Bioassay: Quantitative or qualitative determination of herbicide by use of sensitive indicator plants or other biological organisms.

Biological control of weeds: Control or suppression of weeds by the action of one or more organisms, through natural means or by manipulation of the weed, organism or environment.

Biological control: Suppression or destruction of pest populations by other living organisms (e.g., parasites, predators, microorganisms) other than the host or man.

Biotic: Relating to living things.

Biotype: A population within a species that has a distinct genetic variation.

Blight: A disease characterized by general and rapid killing of leaves, flowers, and stems.

Blotch: A disease characterized by large, irregular-shaped spots or blots on leaves, shoots, and stems.

Boot or Booting: A growth stage of grasses (including cereal crops) when the upper leaf sheath swells due to the growth of the developing spike or panicle.

Broadcast treatment: Applied as a continuous sheet over the entire field.

Brood: Individuals that hatch from the eggs laid by one mother (or the individuals that hatch and mature about the same time).

Canker: A necrotic, often sunken lesion on a stem, branch, or twig of a plant.

Carcinogenic: A property that makes a material more likely to cause cancer in humans or animals that are exposed to that property.

Carrier: A gas, liquid, or solid substance used to dilute or suspend an herbicide during its application.

Caterpillar: The larvae of a butterfly or moth.

Chemical name: The systematic name of a chemical compound according to the rules of nomenclature of the International Union of Pure and Applied Chemistry (IUPAC), Chemical Abstracts Service, or other organization.

Chlorosis: Yellowing of normally green tissue due to chlorophyll destruction or failure of chlorophyll formation.

Cocoon: The silken case in which a pupa develops.

Common name: A generic name for a chemical compound. Glyphosate is the common name for Roundup.

Compatibility: The characteristic of a substance, especially a pesticide, of being mixable in a formulation or in the spray tank for application in the same carrier without undesirably altering the characteristics or effects of the individual components.

Competition: The active acquisition of limited resources by an organism that results in a reduced supply and consequently reduced growth of other organisms in a common environment.

Concentration: For herbicides, the quantity of active ingredient or parent compound equivalent expressed as weight per unit volume (such as pounds per gallon for liquids). Dry herbicide concentrations are expressed as percent by weight.

Contact herbicide: An herbicide that causes injury to only the plant tissue to which it is applied, or an herbicide that is not appreciably translocated within plants.

Contact pesticide: A pesticide that kills on contact.

Cornicles: Projections (tailpipe-like appendages) on the posterior part of the abdomen of certain aphids.

Crawlers: The immature, active-moving stage of scale insects.

Degradation: Degradation occurs due to sunlight, soil microorganisms, and chemical reactions in the soil. Soil temperature and moisture can greatly affect degradation. Degradation rate is quantified in terms of degradation half-life, the time required for 50 percent of the pesticide to decompose to products other than the original pesticide. The EPA considers a pesticide with a soil half-life of greater than 21 days as having a potential for causing ground water concerns due to the pesticide's longevity.

Diapause: Similar to hibernation or the period of rest in the life of an insect (no growth and suspended activity) during the winter or colder months.

Dicot: Abbreviated term for dicotyledon; preferred in scientific literature over broadleaf to describe plants.

Dicotyledon (dicot): A member of the Dicotyledoneae; one of two classes of angiosperms usually characterized by having two seed leaves (cotyledons), leaves with net venation and root systems with tap roots.

Dieback: Progressive death of shoots, twigs, branches, terminal growth, and/or roots generally starting at the tip.

Diluent: Any gas, liquid, or solid material used to reduce the concentration of an active ingredient in a formulation.

Directed application: Precise application to a specific area or plant organ such as to a row or bed or to the leaves or stems of plants.

Disease: Any malfunctioning of host cells and tissues that results from continuous irritation by a pathogenic agent or environmental factor and leads to development of symptoms.

Dispersible granule: A dry granular formulation that will separate or disperse to form a suspension when added to water.

Dormancy: The state of inhibited seed germination or growth of a plant organ when in an environment normally conducive to growth.

Ecotype: A population within a species that has developed a distinct morphological or physiological characteristic (e.g., herbicide resistance) in response to a specific environment and that persists when individuals are moved to a different environment.

Emergence: The event in seedling establishment when a shoot becomes visible by pushing through the soil surface.

Emulsifiable concentrate (EC): A single-phase liquid formulation that forms an emulsion when added to water.

Encapsulated formulation: Herbicide enclosed in capsule or beads of material to control the rate of release of active ingredient and thereby extend the period of activity.

Epidermis: The outermost layer of cells of the leaf and of young stems and roots.

Epinasty: That state in which more rapid growth on the upper part of a plant organ or part (especially leaf) causes it to bend downward.

Exoskeleton: The external skeleton (hard shell covering) of insects and other arthropods.

Exuviae: The cast-off skin (or molt residue) of insects or other arthropods.

Flowable: A two-phase formulation containing solid herbicide suspended in liquid and that forms a suspension when added to water.

Formulation: (1) A pesticide preparation supplied by a manufacturer for practical use. (2) The process, carried out by manufacturers, of preparing pesticides for practical use.

Frass: Insect excrement (fecal material) typically mixed with plant fragments (often associated with boring insects).

Fruiting body: A complex fungal structure containing spores.

Fungicide: A compound toxic to fungi.

Gall: The abnormal growth of plant tissues caused by the stimulus of an insect, mite, nematode, or microorganism/pathogen.

Generation: The period from the beginning of one life cycle (birth) until the end of that life cycle (death).

Granular: A dry formulation consisting of discrete particles generally $<10 \text{ mm}^3$ and designed to be applied without a liquid carrier.

Ground water: A region within the earth that is wholly saturated with water.

Head or heading: A growth stage of grasses (including cereal crops) when the spike or panicle is emerging or has emerged from the sheath.

Herbaceous plant: A vascular plant that does not develop persistent woody tissue above ground.

Herbicide: A chemical substance or cultured biological organism used to kill or suppress the growth of plants.

Herbicide resistance: The trait or quality of a population of plants within a species or plant cells in tissue culture of having a tolerance for a particular herbicide that is substantially greater than the average for the species and that has developed because of selection for naturally occurring tolerance by exposure to the herbicide through several reproductive cycles.

Honeydew: A sweet, sticky, shiny secretion of aphids, whiteflies, scales, and mealybugs. It is a favorable medium for the growth of black, sooty mold (fungi).

Host range: The various kinds of host organisms that may be attacked by a parasite.

Host: An organism that is invaded by another organism and from which the invading organism obtains its nutrients.

Hypha: A single thread of fungus mycelium.

Incorporate: To mix or blend an herbicide into the soil.

Infection: The establishment of a parasite within a host plant.

Infectious disease: A disease that is caused by a pathogen that can spread from a diseased to a healthy plant.

Inoculum: The pathogen or its parts that can cause infection. That portion of individual pathogens that are brought into contact with the host.

Instar: The stage of an insect between molts.

Interference: For plants, the total adverse effect that plants exert on each other when growing in a common ecosystem. The term includes competition, allelopathy, biotic interference, and other detrimental modifications in the community or environment.

Label: The directions for using a pesticide approved as a result of the registration process.

Larva(e): The active, immature stage of an insect with complete metamorphosis (four life stages – egg, larva, pupa and adult), e.g., caterpillars, maggots and grubs.

Latent infection: The state in which a host is infected with a pathogen but does not show any symptoms.

Lateral movement: Movement of an herbicide through soil, generally in a horizontal plane, from the original site of application.

Leaching: (1) The removal of materials in solution from the soil. (2) The downward movement of material(s) into a soil profile with soil water (material may or may not be in true solution and may or may not move from soil).

Leaf spot: A self-limiting lesion on a leaf.

Lesion: A localized area of discolored, diseased tissue.

Life cycle: The changes in the form of an insect, beginning with the egg and ending with the adult reproductive stage (one complete life cycle equals one generation).

Metamorphosis: Changes in form as insects grow and develop.

Mildew: A fungal disease of plants in which the mycelium and spores of the fungus are seen as a whitish growth on the host surface.

Molt: The shedding of the exoskeleton (resulting in an exuviae) by an insect as it grows and develops.

Monocot: Abbreviated term for monocotyledon; preferred in scientific literature over grass to describe plants.

Monocotyledon (monocot): A member of Monocotyledoneae; one of two classes of angiosperms, usually characterized by the following: one seed leaf (cotyledon), leaves with parallel venation, root systems arising adventitiously and usually diffuse (fibrous).

Mosaic: Symptom of certain viral diseases of plants characterized by intermingled patches of normal and light green or yellowish color.

Mottle: An irregular pattern of indistinct light and dark areas.

Mycelium: The hypha or mass of hyphae that make up the body of a fungus.

Mycoplasmalike organisms: Microorganisms found in the phloem and phloem parenchyma of diseased plants and assumed to be the causes of the disease; they resemble mycoplasmas in all respects except that they cannot yet be grown on artificial nutrient media.

Necrosis: Death of tissue (characterized in plants by browning and desiccation).

Necrotic: Dead and discolored.

Nematicide: A chemical compound or physical agent that kills or inhibits nematodes.

Nematode: Microscopic, wormlike animals that live saprophytically in water or soil, or as parasites of plants and animals.

Noninfectious disease: A disease that is caused by an environmental factor, not by a pathogen.

Nonselective herbicide: An herbicide that is generally toxic to all plants treated. Some selective herbicides may become nonselective if used at very high rates.

Nontarget species: A species not intentionally affected by a pesticide.

Nymph: The immature stage (resembling the adult) of an insect that develops through three stages (egg, nymph, adult) or the term for the young insects with gradual metamorphosis.

Overtop application: A broadcast or banded application applied over the canopy of crops such as by airplane or a raised spray boom of ground equipment.

Overwintering stage: The life stage/form of an insect that diapauses to survive winter weather.

Ovipositor: The egg laying apparatus/structure of a female insect.

Parasite: An organism living on or in another living organism (host) and obtaining its food from the latter.

Pathogen: An entity that can incite disease.

Pathogenicity: The capability of a pathogen to cause disease symptoms.

Pelleted formulation: A dry formulation consisting of discrete particles usually larger than 10 cubic millimeters and designed to be applied without a liquid carrier.

Persistence: The ability of a substance to remain in its original form without breaking down.

Persistent herbicide: A herbicide that, when applied at the recommended rate, will harm susceptible crops planted in normal rotation after harvesting the treated crop, or that interferes with regrowth of native vegetation in noncrop sites for an extended period of time. See residual herbicides.

Pesticide interaction: The action or influence of one pesticide upon another and the combined effect of the pesticide(s) on the pest(s) or crop system.

Pheromone: A biochemical substance produced by insects to communicate with the same species through the sense of smell. An insect sex pheromone is a chemical produced by the females to attract males.

Phloem: The living tissue in plants that functions primarily to transport metabolic compounds from the site of synthesis or storage to the site of use.

Phytotoxic: Injurious or lethal to plants.

Plant growth regulator: A substance used for controlling or modifying plant growth processes without severe phytotoxicity.

Postemergence (POST): (1) Applied after emergence of the specified weed or crop. (2) Ability to control established weeds.

Predaceous: Feeding on another organism, usually killing it.

Preemergence (PRE): (1) Applied to the soil before emergence of the specified weed or crop. (2) Ability to control weeds before or soon after they emerge.

Preplant application: Applied before planting or transplanting a crop, either as a foliar application to control existing vegetation or as a soil application.

Preplant incorporated (PPI): Applied and blended into the soil before seeding or transplanting, usually by tillage.

Prolegs: The fleshy abdominal legs of caterpillars and sawfly larvae.

Pupa(e): The resting/transformation stage between the larva and adult in insects with complete metamorphosis.

Pustule: Small, blister-like elevation of epidermis created as spores form underneath and push outward.

Rate: For herbicides, the quantity of active ingredient expressed as weight per unit area of treated surface or per unit volume of the treated environment for aquatic applications.

Registration: The process designated by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and carried out by the Environmental Protection Agency (EPA) by which a pesticide is legally approved for use in the U.S.

Residual herbicide: An herbicide that persists in the soil and injures or kills germinating weed seedlings for a relatively short period of time after application. See persistent herbicide.

Residual: A pesticide persisting for several days, weeks, or longer after application in amounts sufficient to kill.

Residue: That quantity of an herbicide or metabolite remaining in or on the soil, plant parts, animal tissues, whole organisms and surfaces.

Resistance: Chemical, structural or other mechanisms that retard, degrade or render a pesticide ineffective to an organism, or the possession of qualities that hinder the development of a given pathogen, resulting in little or no infection. **Note: (1)** Resistance in insects or mites where a pesticide does not kill the pests is not immunity. Insecticide resistance is the ability of some individuals of a pest population to survive exposure to an insecticide that would be fatal to others because of some genetic (inheritable) difference between them and the other individuals. It tends to occur in pest populations where they are regularly exposed to an insecticide. Pests with high reproductive rates and short life cycles (resulting in more generations produced in the shortest period of time) provide the greatest potential for the occurrence of resistance. **(2)** There is no general agreement as to the distinction between herbicide tolerance and herbicide resistance in plants.

Resting spore: A sexual or other thick-walled spore of a fungus that is resistant to extremes in temperature and moisture and which often germinates only after a period of time from its formation.

Ringspot: A circular area of chlorosis with a green center; a symptom of many virus diseases.

Rot: The softening, discoloration, and often disintegration of a succulent plant tissue as a result of fungal or bacterial infection.

Rust: A disease giving a “rusty” appearance to a plant and caused by one of the Uredinales (rust fungi).

Safener: A substance that reduces toxicity of herbicides to crop plants by a physiological mechanism.

Scab: A roughened, crustlike diseased area on the surface of a plant organ. A disease in which such areas form.

Scorch: “Burning” of leaf margins as a result of infection or unfavorable environmental conditions.

Selective herbicide: A chemical that is more toxic to some plant species than to others.

Senescent: The growing old and dying back of plant tissue.

Sessile: Term describing certain stages of an insect that are normally immobile (as stationary to an area and feeding), e.g., scale insects after the crawler stage.

Seta(e): Hairlike sensory structures found on the exoskeleton of insects and other arthropods.

Shot-hole: A symptom in which small disease fragments of leaves fall out and leave small holes in their place.

Sign: The pathogen or its parts or products seen on a host plant.

Skeletonize: Describing the feeding pattern of certain leaf-feeding insects that remove the tissue from leaves except for the veins.

Slope and landscape: Areas with high runoff capability will have less of an impact on water infiltration than areas that are flat or have a concave slope. Landscape that encourages runoff will minimize leaching. Landscape that holds water may increase leaching potential or may provide organic matter which assists in “holding” the pesticide.

Soil organic matter: Soil organic matter helps to bind pesticides, especially those with high K_{oc} values, and promotes degradation.

Soil permeability: Permeability is a function of soil texture, structure, and pore space. Highly permeable, coarse, sandy soils have large pores that allow water and pesticides to move rapidly between soil particles during rainfall or irrigation. In medium- and fine-textured soils, water moves more slowly, allowing more time for pesticide adsorption and degradation. Each layer of soil can have a different permeability, but the most restrictive layer determines the overall permeability. Soil permeability can be enhanced by the presence of macropores – large channels produced by plant roots, earthworms, soil cracks, and the burrowing of smaller animals.

Soil pH: The pH of the soil is a measure of its degree of acidity or alkalinity. The pH affects the degradation rate of pesticides and the adsorption characteristics and mobility of ionic pesticides.

Soil texture: Texture is determined by the reactive proportion of sand, silt, and clay. Permeability and chemical adsorption are both affected by soil texture.

Soluble concentrate (SC): A liquid formulation that forms a solution when added to water.

Soluble granule (SG): A dry granular formulation that forms a solution when added to water.

Soluble powder: A dry formulation that forms a solution when added to water.

Solution: A homogeneous or single-phase mixture of two or more substances.

Spore: The reproductive unit of fungi consisting of one or more cells; it is analogous to the seed of green plants.

Sporulate: To produce spores.

Spot treatment: An herbicide applied to restricted area(s) of a whole unit; i.e., treatment of spots or patches of weeds within a larger field.

Spray drift: Movement of airborne spray from the intended area of application.

Surfactant: A material that improves the emulsifying, dispersing, spreading, wetting or other properties of a liquid by modifying its surface characteristics.

Susceptibility: (1) The sensitivity to or degree to which a plant is injured by an herbicide treatment. (2) The inability of a plant to resist the effect of a pathogen or other damaging factor.

Susceptible: Lacking the inherent ability to resist disease or attack by a given pathogen; nonimmune.

Suspension: A mixture containing finely divided particles dispersed in a solid, liquid, or gas.

Symptom: The external and internal reactions or alterations of a plant as a result of a disease.

Systemic: Synonymous with translocated herbicide, but more correctly used to describe the property of insecticides or fungicides that are absorbed into a plant

(through roots or leaves) and translocated to other tissue.

Tank-mix combination: Mixing of two or more pesticides or agricultural chemicals in the spray tank at the time of application.

Thorax: The middle body region of an insect (where the legs and wings are attached).

Tiller or Tillering: A growth stage of grasses when additional shoots are developing from the crown.

Tolerance: (1) Ability to continue normal growth or function when exposed to a potentially harmful agent (there is no general agreement as to the distinction between herbicide tolerance and herbicide resistance in plants). (2) The concentration of a pesticide residue that is allowed in or on raw agricultural commodities as established by the Environmental Protection Agency.

Toxicity: The quality or potential of a substance to cause injury, illness, or other undesirable effects.

Toxicology: The study of the principles or mechanisms of toxicity.

Trade name: A trademark or other designation by which a commercial product is identified.

Translocated herbicide: An herbicide that is moved within the plant. Translocated herbicides may be either phloem mobile or xylem mobile. However, the term frequently is used in a more restrictive sense to refer to herbicides that are applied to the foliage and move downward through the phloem to underground parts.

Vapor drift: The movement of pesticides as vapor from the area of application after the spray droplets have landed on the target.

Vascular: Term applied to a plant tissue or region consisting of conductive tissue; also refers to a pathogen that grows primarily in the conductive tissues of a plant.

Virulence: The degree of pathogenicity of a given pathogen.

Virulent: Capable of causing a severe disease; strongly pathogenic.

Virus: A submicroscopic obligate parasite consisting of nucleic acid and protein.

Volatilization: Volatilization or evaporation reduces the total amount of pesticide available for movement to water. Volatilization increases with air temperature and the vapor pressure of the pesticide formulation. It occurs more rapidly in wet than in dry soils.

Water solubility: A pesticide's water solubility is often viewed as an indicator of its mobility in water. Water solubility and adsorption to soil particles, for most compounds, are inversely related. However, as with most rules, there are exceptions. Water solubility greater than 30 ppm indicates that significant mobility is possible if the K_{oc} value is low (less than 300 -500). The EPA considers pesticides with solubility greater than 30 ppm and K_{oc} values less than 100 to be a concern in sandy soils. Pesticides with solubilities of 1 ppm or less are believed to have a higher likelihood of runoff. Likewise, pesticides with high K_{oc} values have a higher likelihood of runoff than leaching. Pesticides with K_{oc} values of 1,000 or higher have a strong attachment to soil. Solubility is measured in mg/l of the pesticide in water at room temperature (20 or 25°C). It is generally the solubility of the pure (active ingredient) that is measured, not the formulated product.

Water table: The upper limit of the saturated level of the soil.

Weed: Any plant that is objectionable or interferes with the activities or welfare of man.

Weed control: The process of reducing weed growth and/or infestation to an acceptable level.

Weed eradication: The elimination of all vegetative plant parts and viable seeds of a weed from a site.

Wettable powder (WP): A finely divided dry formulation that can be readily suspended in water.

Wetting agent: (1) A substance that serves to reduce the interfacial tensions and causes spray solutions or suspensions to make better contact with treated surfaces (see surfactant). (2) A substance in a wettable powder formulation that causes it to wet readily when added to water.

Wilt: Loss of rigidity and drooping of plant parts generally caused by insufficient water in the plant.

Xylem: The nonliving tissue in plants that functions primarily to conduct water and mineral nutrients from roots to the shoot.

Zoospore: A spore bearing flagella and capable of moving in water.