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Aquatic Weed Terms, Definitions and Abbreviations ¹

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ABSORPTION: The process by which a 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 the active ingredient content of a formulation.

ACTIVATE: The process by which a surface applied herbicide becomes phytotoxic after a rainfall. Activation results from movement of the herbicide into the soil where it can be absorbed by seeds of weed seedlings, and not from any chemical change in the active ingredient.

ACRE-FOOT: One acre of water which is one foot in depth.

ACTIVE INGREDIENT (ai): The chemical(s) in a formulated product that is (are) principally responsible for the herbicidal effects and that is (are) shown as active ingredient(s) on herbicide labels.

ACUTE TOXICITY: The quality or potential of a substance to cause injury or illness shortly after exposure to a relatively large dose. (See chronic toxicity.)

ADJUVANT: Any substance in a herbicide formulation or added to the spray tank to improve herbicidal activity or application characteristics.

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

ALGAE: Photosynthetic plants that contain chlorophyll, have simple reproductive structures, and whose tissues are not differentiated into true roots, stems, or leaves.

ALGAL BLOOM: Excessive, or dense growths, of a single or several species of algae. Usually of relatively short duration but may persist for extended periods.

ALGICIDE (ALGAECIDE): A chemical compound that kills algae.

ALLELOPATHIC SUBSTANCES: Chemical compounds produced by plants (and microorganisms) that affect the interactions between different plants (and microorganisms).

ANTAGONISM: An interaction of two or more chemicals such that the effect, when combined,

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is less than the predicted effect based on the activity of each chemical applied separately.

ANTIDOTE: (1) A chemical applied to prevent the phytotoxic effect of a specific herbicide on desirable plants. (Synonymous with protectant.) (2) A substance used as a medical treatment to counteract herbicide poisoning.

APOPLAST: The total, non-living continuum in a plant including cell walls, intercellular spaces, and the xylem vessels that forms a continuous, permeable system through which water and solutes may move.

AT EMERGENCE: Treatment applied during the visible, emerging phase of the specified crop or weed.

BAND TREATMENT: Applied to a continuous, linear restricted area such as on or along a crop row rather than over the entire field area.

BASAL TREATMENT: Applied to encircle the stem of a plant above and at the ground such that foliage contact is minimal. A term used mostly to describe treatment of woody plants.

BED: (1) A ridge of soil formed for planting crops above furrows on each side, (2) An area in which seedlings or transplants are grown for planting in the field later.

BENTHIC: Of aquatic habitats, those organisms that live on, or in the sediments; bottom dwelling.

BIOASSAY: Quantitative determination of herbicide concentration by use of sensitive indicator plants or other biological agents.

BIOCONTROL 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.

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

BLIND CULTIVATION: Cultivation before seeded crops emerge.

BOTANICAL PLANT NAME (LATIN NAME): In the proper context, the scientific name of a plant is composed of two terms, a genus and species; but many times only the generic name is given. An exacting method of referring to a plant as opposed to a common name.

BROADCAST TREATMENT: Applied as a continuous sheet over the entire treated area.

BROADCAST RATE EQUIVALENT: For band treatments, it is the rate for a broadcast treatment that would be equivalent to the rate applied to the band area, or the weight of herbicide applied per unit area when only the band area is considered. All rates for band treatment should be expressed as the broadcast rate equivalent.

BRUSH CONTROL: Control of woody plants such as brambles, sprout clumps, shrubs, trees, and vines.

CARCINOGENIC: Capable of causing cancer in animals.

CARRIER: A gas, liquid, or solid substance used to dilute, propel, or suspend a herbicide during its application.

CHELATE: A combination of a metal ion and an organic molecule which results in making the metal ion less reactive with other chemical species in water or in a soil solution.

CHEMICAL NAME: The name applied to a herbicide active ingredient which describes its chemical structure according to rules prescribed by the American Chemical Society and published in the Chemical Abstracts Indexes.

CHEMOTYPE: A group of organisms that produce the same profile for a particular class of chemicals such as chalcones, aurones, flavanols, etc.

CHLOROSIS: Loss of green color (chlorophyll) from foliage.

CHRONIC TOXICITY: The quality or potential of a substance to cause injury or illness after repeated exposure to small doses over an extended period of time. (See acute toxicity.)

COLONIAL ALGAE: Groups, or aggregations, of a few to many individual algal cells growing in association with one another.

COMMON NAME: An abbreviated name applied to a herbicide active ingredient usually agreed upon by the American National Standards Institute and the International Organization for Standardization.

COMPATIBILITY: Mixable in the formulation or in the spray tank for application in the same carrier without undesirably altering the characteristics or effects of the individual components.

CONCENTRATION: The amount of active ingredient or herbicide equivalent in a quantity of diluent expressed as percent, lb/gal, kg/L, etc.

CONTACT HERBICIDE: A herbicide that causes localized injury to plant tissue where contact occurs.

CRACKING: The time when the soil above the emerging crop seedlings is beginning to crack.

CULTIVATION: Mechanical soil agitation after crop emergence for the purpose of killing weeds.

DEFOLIANT: Any substance or mixture of substances for which the primary use is to cause the leaves or foliage to drop from a plant.

DESICCANT: Any substance or mixture of substances used to accelerate the drying of plant tissue.

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 lower leaves and stems of plants.

DISPERSIBLE GRANULE: A dry granular formulation which will separate or disperse to form a suspension when added to water.

DORMANCY: State of inhibited germination of seeds or plant organ growth in the presence of the required conditions for initiating growth.

EARLY POSTEMERGENCE: Applied after emergence during the cotyledonous growth phase of crop or weed seedlings.

ECOTYPE: A population within a species that has developed a distinct morphological or physiological characteristic (including herbicide resistance) as an adaptation to a specific environment and which persists when individuals are moved to a different environment.

EMERSED PLANT: A rooted or anchored aquatic plant adapted to grow with most of its leaf-stem tissue above the water surface and not lowering or rising with the water level.

EMERGENCE: The event in seedling or perennial growth when a shoot becomes visible by pushing through the soil surface.

EMULSIFIER: A surface active substance which promotes the suspension of one liquid in another.

EMULSIFIABLE CONCENTRATE (ec): A single phase liquid formulation which forms an emulsion when added to water.

EMULSION: The suspension of one liquid as minute globules in another liquid (for example, oil dispersed in water).

ENCAPSULATED FORMULATION: Herbicide enclosed in capsules (or beads) of thin polyvinyl or other material to control the rate of release of chemical and thereby extend the period of activity.

EPINASTY: That state in which more rapid growth on one side of a plant organ or part (especially leaf) causes it to bend or curl downward.

EXTENDER: A chemical which increases the longevity of a herbicide.

FILAMENTOUS ALGAE: Algae which grow as filaments, or strands of cells; the filaments can either be branched or unbranched.

FLOATING PLANT: A free-floating or anchored aquatic plant adapted to growth with most of its vegetative tissue at or above the water surface and lowering or rising with the water level.

FLOWABLE: A two-phase formulation that contains solid herbicide suspended in liquid, and which forms a suspension when added to water.

FOLIAR APPLICATION: Application of a herbicide to the leaves or foliage of plants.

FORMULATION: (1) A herbicidal preparation supplied by a manufacturer for practical use. (2) The process, carried out by manufacturers, of preparing herbicides for practical use.

GERMINATION: The process of initiating growth in seeds.

GRANULE OR GRANULAR: A dry formulation of herbicide and other components in discrete particles, generally less than 10 cubic millimeters, and designed to be applied without a liquid carrier.

GROWTH REGULATOR: A substance used for controlling or modifying plant growth processes without appreciable phytotoxic effect at the dosage applied.

GROWTH STAGES FOR CEREAL CROPS:

Tiller or Tillering - when additional shoots are developing from the crown;

Joint or Jointing - when stem internodes begin elongating;

Boot or Booting - when the upper leaf sheath swells due to the growth of developing spike or panicle;

Head or Heading- when the seed head is emerged from the sheath.

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

HERBICIDE: A chemical used to control, suppress, or kill plants, or to severely interrupt their normal growth processes.

HERBICIDE EQUIVALENT: The possible or theoretical yield of herbicidal compound from the active ingredient in a formulation (applied especially to compounds not derived from acids).

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; this tolerance having developed because of selection for naturally occurring tolerance by exposure to the herbicide through several reproductive cycles.

INCORPORATE: To mix or blend a herbicide into the soil.

INVERT EMULSION: The suspension of minute water droplets in a continuous oil phase.

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

LATE POSTEMERGENCE: Applied after the specified crop or weeds are well established.

LATERAL MOVEMENT: Movement of a herbicide through soil, generally in a horizontal plane, from the original site of application.

LAY BY APPLICATION: Applied and incorporated with or applied after the last cultivation of a crop.

LC50: The concentration of a chemical(s) in air (inhalation toxicity) or water (aquatic toxicity) that will kill 50% of the organisms in a specific test situation.

LD50: The dose (quantity) of a chemical(s) calculated to be lethal to 50% of the organisms in a specific test situation. It is expressed in weight of the chemical (mg) per unit of body weight (kg) of the test organism. The toxicant may be fed (oral LD50), applied to the skin (dermal LD50), or administered in the form of vapors (inhalation LD50).

MACROPHYTE: A large, or macroscopic, plant that is easily seen without aid of microscope.

METABOLITE: A compound derived from metabolic transformation of a herbicide by plants or other organisms.

MUTAGENIC: Capable of causing genetic changes.

NECROSIS: Localized death of tissue usually characterized by browning and desiccation.

NON-SELECTIVE HERBICIDE: A herbicide that is generally toxic to all plants without regard to species. This may be a function of dosage, method of application, timing of application, or other such factor. Some selective herbicides may become non-selective if used at very high rates.

NO-TILL: Planting crop seed directly into stubble or sod with no more soil disturbance than is necessary to get the seed into the soil.

NON-TARGET SPECIES: Species not intentionally affected by a pesticide.

NOXIOUS WEED: A weed specified by law as being especially undesirable, troublesome, and difficult to control. Definition will vary according to legal interpretations.

ONCOGENIC: Capable of producing or inducing tumors in animals, either benign (non-cancerous) or malignant (cancerous).

OVERTOP APPLICATION: Applied over the top of transplanted or growing plants such as by airplane or raised spray boom of ground rigs. A broadcast application above the plant canopy.

PARTS PER MILLION, WEIGHT (ppmw): One part of a substance in one million parts of another substance, by weight; for example, approximately 2.72 lbs of active ingredient applied to one acre-foot of water will give 1 ppmw.

PELLETED FORMULATION: A dry formulation of herbicide and other components in discrete particles, usually larger than 10 cubic millimeters, and designed to be applied without a liquid carrier.

PERSISTENT HERBICIDE: A herbicide which, when applied at the recommended rate, will harm susceptible crops planted in normal rotation after harvesting the treated crop, or which interferes with regrowth of native vegetation in non-crop 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 on the pest(s) or crop system.

PHYTOPLANKTON: The plant portion of the plankton community. They are usually microscopic and can grow as single cells, colonies, or filaments; some multicellular forms can be macroscopic.

PHYTOTOXIC: Injurious or lethal to plants.

PLANKTON: The community of organisms that drift or float in the water; some are capable of movement, but not against a current.

PLANT GROWTH REGULATOR: A substance used for controlling or modifying plant growth processes without appreciable phytotoxic effect at the dosage applied.

PHLOEM: The living tissue in plants which functions primarily to transport metabolic compounds from the site of synthesis or storage to the site of utilization.

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

PRECIPITATE: The formation of a solid substance that no longer will remain dissolved in water due to some physical or chemical process.

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

PREEMERGENCE INCORPORATED: Applied after seeding and incorporated in the soil above the seed.

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 tilled into the soil before seeding or transplanting.

RATE: The amount of active ingredient or acid equivalent applied per unit area or other treatment unit. Rates of formulation per area should not be used in scientific publications.

RECIRCULATING SPRAYER: A sprayer system with the nozzle aimed at a catchment device which recovers and recirculates herbicide that does not hit plants or weeds that pass between the nozzles and the catchment device.

REGISTRATION: The regulatory process designated by FIFRA and conducted by the EPA through which a pesticide is legally approved for use.

RESIDUE: That quantity of a herbicide remaining in or on the soil, plant tissue, animal tissue, whole organisms, and surfaces.

RESIDUAL HERBICIDE: A herbicide that persists in the soil and injures or kills germinating weed seedlings over a relatively short period of time. (See persistent herbicide.)

SAFENER: A substance which reduces toxicity of a specific herbicide to the crop.

SEED PROTECTANTS: A substance applied to seed before planting to control pests.

SELECTIVE HERBICIDE: A chemical that is more toxic to some plant species than to others (may be a function of dosage or mode of application).

SOFT AND HARD WATERS: Terms for classifying water which is based on hardness, a water quality parameter. Soft waters are those in which total hardness is less than 50 mg calcium carbonate per liter (parts per million); hard waters are those in which total hardness is greater than 100 mg calcium carbonate per liter; moderately hard waters are those between 50 and 100 mg calcium carbonate per liter.

SOIL APPLICATION: Applied primarily to the soil surface rather than to vegetation.

SOIL INJECTION: Placement of the herbicide beneath the soil surface with a minimum of mixing or stirring of the soil, as with an injection blade, knife, or tine.

SOIL LAYERED: Placement of the herbicide beneath the soil surface in a continuous layer with a minimum of mixing.

SOLUBLE CONCENTRATE: A liquid formulation which forms a solution when added to water.

SOLUBLE POWDER: A dry formulation which forms a solution when added to water.

SOLUBLE SOLID: A dry herbicide formulation that is soluble in the carrier liquid.

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

SPOT TREATMENT: A 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.

SUBMERSED PLANT: An aquatic plant adapted to grow with all or most of its vegetative tissue below the water surface.

SURFACTANT: A material which improves the emulsifying, dispersing, spreading, wetting, or other surface modifying properties of liquids.

SUSCEPTIBILITY: The sensitivity to or degree to which a plant is injured by a herbicide treatment. (See Tolerance.)

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

SYMPLAST: The total mass of continuous living cells in a plant connected by plasmodesmata and including the phloem.

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

SYSTEMIC HERBICIDE: Synonymous with translocated herbicide but more often used to describe the action of insecticides or fungicides.

TANK-MIX COMBINATION: Mixing of two or more pesticides or agricultural chemicals in the spray tank at the time of application.

TERATOGENIC: Capable of producing congenital malformations in the fetus (birth defects).

TILLAGE: Preparation of a seedbed involving soil disturbance or displacement.

TOLERANCE: (1) Capacity to withstand herbicide treatment without marked deviation from normal growth or function. (See susceptibility.) (2) The concentration of herbicide residue that will be allowed in or on agricultural products.

TOPICAL APPLICATION: Treatment of localized surface site such as a single leaf blade, petiole, or growing point.

TOXICITY: The quality or potential of a substance to cause injury or illness.

TOXICOLOGY: The study of the principles or mechanism of toxicity.

TRADE NAME: A trademark applied to a herbicide formulation by its manufacturer.

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

VAPOR DRIFT: The movement of chemical vapors from the area of application. Some herbicides, when applied at normal rates and normal temperatures, have a sufficiently high vapor pressure to change them into vapor form which may cause injury to susceptible plants distant from the site of

application. Note: Vapor injury and injury from spray drift are often difficult to distinguish.

VASCULAR PLANT: A plant (macrophyte) with specialized conductive tissue.

VOLATILE HERBICIDE: A herbicide having a sufficiently high vapor pressure that, when applied at normal rates and normal temperatures, its vapors may cause serious irreversible injury to desirable plants away from the site of application. Note: Vapor injury and injury from spray drift are often difficult to distinguish.

WATER DISPERSIBLE SLURRY: A two-phase concentrate that contains solid herbicide suspended in liquid which is capable of suspension in water.

WEED: A plant growing where it is not desired. Any plant that is objectionable or interferes with the activities or welfare of man.

WEED CONTROL: The process of reducing weed growth or infestations to an acceptable or adequate level with respect to aesthetic, economic, public health, or other reasons.

WEED ERADICATION: The elimination of all live plant parts and viable seeds of a weed from a site.

WETTING AGENT: (1) Substance which serves to reduce interfacial tensions and causes spray solutions or suspension to make better contact with treated surfaces. (See surfactant.) (2) A substance in a wettable powder formulation which causes it to wet readily when added to water.

WETTABLE POWDER (wp): A finely divided dry formulation that can be suspended in water.