GLOSSARY

**ABSORPTION**—Penetration of a substance from the surface to below the surface.

**ADSORPTION**—The adhesion in an extremely thin layer of molecules to the surfaces of solid bodies or liquids with which they are in contact.

**ACID EQUIVALENT**—The acid portion of the active ingredient. Rates of acid-based herbicides (2,4-D, dicamba, glyphosate, dalapon, picloram) should be expressed as acid equivalents per unit area.

**ACTIVE INGREDIENT (ai)**—The chemical in a formulated product responsible for herbicidal effects.

**ACUTE ORAL LD$_{50}$**—The dosage required to kill 50% of the test animals when given in a single oral dose in toxicity studies.

**ACUTE TOXICITY**—The amount of a substance, as a single dose, to cause poisoning in a test animal.

**ADJUVANT**—Any substance in a herbicide formulation that enhances the effectiveness of the herbicide.

**ADSORPTION**—Adherence of a substance to a surface.

**ANIONIC SURFACTANT**—A surface-active additive to a herbicide having a negative charge but not commonly used with herbicides.

**ANNUAL**—A plant that completes its life cycle in 1 year, i.e., germinates from seed, produces seed, and dies in the same season. Examples include pigweed, ragweed, mustard, foxtail, and crabgrass. A winter annual is one that germinates in the fall, lives over winter, then flowers and seeds the following spring and summer. Examples include pennyrroyal, hedge mustard, and pepper-grass are winter annuals. (Also see Winter Annual.)

**ANTAGONISM**—Opposing action of different chemicals such that the action of one is impaired or the total effect is less than that of one component used separately.

**ANTIDOTE**—A practical immediate treatment, including first aid, in case of poisoning.

**APOPLASTIC TRANSLOCATION**—Movement through the 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. Many apoplastic translocated herbicides are taken up by roots from the soil.

**AQUATIC PLANT**—A plant that grows in water. There are three kinds: Submergent—which grows beneath the surface; Emergent—which grows above the water (cattails and water lilies); and Floaters—such as water hyacinth.

**BAND OR ROW APPLICATION**—An application to a continuous restricted area, such as in, on, or along a crop row rather than over the entire field.

**BASAL TREATMENT**—An application to the stems of plants at and just above ground line.

**BERM**—Narrow shelf typically along the water’s edge of canals formed by deposited silt.

**BIENNIAL**—A plant that completes its life cycle in 2 years. The first year it produces leaves and stores food. The second year it blossoms and produces fruits and seeds. Examples include wild carrot, common mullein, bull thistle, and burdock.

**BIOASSAY**—The qualitative or quantitative determination of a substance by response measurements of treated living organisms as compared to measurements on the same untreated, check, or standard living organism.

**BROADCAST APPLICATION**—An application of spray over an entire area or field rather than only on rows, beds, middles, or individual plants.

**BROADLEAF PLANTS**—Botanically classified as dicotyledons. Plants have two cotyledon leaves in the seedling stage; true leaves are mostly broad and have netlike or reticulate veins.

**CARCINOGEN**—A substance capable of producing cancer.

**CARRIER**—A gas, liquid, or solid substance used to dilute, propel, or suspend a herbicide to facilitate its preparation, storage, shipment, or use. (See also Diluent.)

**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, and other organization.

**CHLOROSIS**—Loss of green color in foliage followed by yellowing on the tissue.

**CHRONIC TOXICITY**—Results produced in test animals exposed for long periods to chemicals.

**COMMON NAME**—A generic name for a chemical compound.

**COMPATIBLE**—Two compounds or products can be mixed without affecting each other’s performance.

**COMPETITION**—The active acquisition of limited resources by an organism which results in a reduced supply and, consequently, reduced growth of other organisms in a common environment.

**CONCENTRATION**—The amount of active ingredient or herbicide in a quantity of diluted expressed as percent, lb/gal, etc.

**CONTACT HERBICIDE**—A herbicide that is phytotoxic by contact with plant tissue rather than as a result of translocation. Only that portion of a plant contacted is directly affected. Young seedlings are killed, but perennials may recover from the uninjured parts below ground.

**CRP**—Conservation reserve program.

**CUTICLE**—Waxy, fatty material that covers plant surfaces such as leaves.

**CUT-SURFACE APPLICATION**—Treatments applied to frills or girdles that have been made through the bark into the wood of tree.

**DECIDUOUS PLANTS**—Plants that are perennial in habit but lose their leaves during winter.

**DEFOILANT**—A material that causes the leaves to fall from plants.

**DEGRADATION**—The process by which a chemical is decomposed or broken down into less complex compounds or elements.

**DEOXYGENATION**—Depletion of oxygen.

**DERMAL TOXICITY**—Measures the amount of a pesticide or poisonous...
material that can be absorbed through the skin of animals to produce toxic symptoms.

DESIICCANT—Any substance or mixture of substances used to accelerate the drying of plant tissue. Foliage often is killed by contact action and seed moisture is reduced.

DETERGENT—Any liquid or solid material that will remove residues from application equipment, such as dishwashing and laundry detergent.

DICOT—(dicotyledon)—A plant that has two seed leaves or cotyledons. Generally includes broadleaf plants.

DILUENT—Any liquid or solid material to dilute the technical toxicanent to field strength for adequate plant coverage.

DIRECTED APPLICATION—Precise application to a specific area or plant organ such as to a row or bed or to a specific part of the plant.

DISPERSING AGENT—A material that reduces the cohesive forces between similar particles.

DISSOLVE—Solids that form solutions where no residue remains.

DORMANCY—State of inhibited germination of seeds or growth of plant organs. A state of suspended development.

DORMANT SPRAY—Chemical applied in winter or very early spring before treated plants have started active growth.

DOSE (RATE)—The terms are the same; however, rate is preferred. Refers to the amount of active ingredient applied to a unit area regardless of percentage of chemical in the carrier.

DRIFT—The movement of airborne particles by air motion or wind away from the intended target area.

ECOSYSTEM—An ecological entity consisting of the biotic community and the nonliving environment functioning together in an inseparable interacting system.

EMERGENCE—The act of a germinating seedling’s breaking through the soil surface.

EMETIC—A material used to cause vomiting to rid stomachs of poisonous compounds.

EMULSIFIABLE CONCENTRATE (EC)—A concentrated herbicide formulation containing organic solvents and adjuvants to facilitate emulsification with water.

EMULSIFIER—A surface-active substance that promotes the suspension of one liquid in another.

EPINASTY—Twisting or curling of leaves and stems caused by uneven growth of cells. This is a characteristic reaction from treatment with 2,4-D and other growth regulators.

ESTER—A compound formed by reaction of an acid and an alcohol accompanied by the loss of water formed during the reaction.

FERTILIZER—Any organic or inorganic material of natural or synthetic origin that is added to the soil to supply one or more elements essential to the growth of the plants.

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

FORMULATION—A mixture containing the active pesticide, the carrier, diluents, and other additives required to make the material ready for application.

FRILL APPLICATION—Placement of a herbicide into a series of overlapping ax cuts made through the bark in a ring around the trunk of a tree.

FUMIGANT—Chemical used in the form of a volatile liquid or a gas to kill insects, nematodes, fungi, bacteria, seeds, roots, rhizomes, or entire plants; usually applied in an enclosure of some kind or in the soil with a plastic or water surface seal.

GPA—Gallons per acre.

GPM—Gallons per minute.

GRANULE OR GRANULAR—A dry formulation of herbicide in which the active ingredient is impregnated on small particles of carrier such as clay or ground-up corncobs.

GRASS—Botanically, any plant of the Gramineae family. Grasses are characterized by narrow leaves with parallel veins; by leaves composed of blade, sheath, and ligule; by jointed stems and fibrous roots; and by inconspicuous flowers usually arranged in spikelets.

GROWTH REGULATOR—A substance used for controlling or modifying plant growth processes.

HARD WATER—Water that contains certain minerals, usually calcium and magnesium sulfates, chlorides, or carbonates in solution in sufficient amounts to cause a curd or precipitate instead of a lather when soap is added. Generally defined as water containing 332 ppm of calcium carbonate. Very hard water may cause precipitates in some herbicidal sprays.

HAZARD—The probability that injury or detrimental effects will result if a substance is not used properly.

HERBACEOUS—A plant that remains soft or succulent and does not develop woody tissue.

HERBICIDE—A phytotoxic chemical used for killing or inhibiting (stunting) the development or growth of plants.

HIGH-VOLUME SPRAYS—Spray applications of more than 60 gallons per acre volume.

HORMONE—A naturally occurring substance in plants that controls growth or other physiological processes. It is used with reference to certain synthetic chemicals that require or affect growth activity.

HYDROSOIL—Soil at bottom of the body of water.

INCORPORATE INTO SOIL—The mixing of a herbicide into the soil, generally by mechanical means or with overhead water.

INERT INGREDIENT—That part of a compound without toxic or killing properties, sometimes called the carrier.

INHIBIT—To hold in check or stop; e.g., to inhibit or check seed germination or plant growth with herbicides.

INTERFERENCE—The effect that the presence of a plant has on its neighboring plants, the process includes competition, mutualism, commensalism, ammensalism, and parasitism.

INVERT EMULSION—The suspension of minute water droplets in a continuous oil phase, usually forming a thick, mayonnaise like mixture.

IONIC SURFACTANT—One that ionizes or dissociates in water.

LABEL—All written, printed, or graphic matter on or attached to pesticide containers as required by law.
LAY-BY APPLICATION—Applied with or after the last cultivation of a crop.

LC₅₀—The concentration of a substance in air (inhalation toxicity), water (aquatic toxicity) or continual exposure in diet that will kill 50% of the organisms in a specific test situation.

LD₅₀—The dose (quantity) of a substance that will 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) and the toxicant may be fed (oral LD₅₀), applied to the skin (dermal LD₅₀), or administered in the form of vapors (inhalation LD₅₀).

LEACHING—The downward movement of a substance in solution through the soil.

LEAF BLADE—Flat portion of a leaf.

LETHAL—Fatal or deadly.

LOW-VOLATILE ESTER (LVE)—An ester compound with a high molecular weight and a low vapor pressure such as butoxyethanol, isooctyl, or propylene glycol butyl ester.

LOW-VOLUME SPRAY—A spray application of 5 to 20 gallons per acre.

MECHANISM-OF-ACTION—The specific biochemical or biophysical event or events that express the herbicide effect.

MISCIBLE LIQUIDS—Two or more liquids capable of being mixed, which will remain mixed under normal conditions.

MODE-OF-ACTION—The entire chain of events from first contact of the herbicide to the final effect on the plant.

MONOCOT (monocotyledon)—A seed plant having a single cotyledon or seed leaf. Includes corn, grasses, lilies, orchids, palms, etc. Leaves are mostly parallel-veined.

MUTAGEN—A compound having the property to induce mutations.

NECROSIS—Localized death of living tissue as, for example, following desiccation, browning, and loss of function.

NICHE—The minimal resource needs of a plant, includes both spatial and temporal components.

NONIONIC SURFACTANT—Chemically inert and often used with herbicides.

NONSELECTIVE HERBICIDES—Chemicals or formulations that destroy or prevent plant life in general without regard to species.

NOXIOUS WEED—A weed arbitrarily defined by law as being especially undesirable, troublesome, or difficult to control.

OILS—Usually refers to aromatic or paraffinic oils used in formulating products, as diluents or carriers for herbicides or for direct use.

ONCOCGENIC—A substance capable of producing tumors.

ORAL TOXICITY—Toxicity of a compound when it is ingested.

PPM—Parts per million.

PELLET—A dry formulation of herbicide and other components in discrete particles usually larger than 10 cubic centimeters.

PERENNIAL—A plant that continues to live from year to year. In many cases, in cold climates the tops die down but the roots and rhizomes persist. (Examples—field bindweed, Canada thistle, quackgrass, dandelion.)

PERSISTENT HERBICIDE—A herbicide that, when applied at the recommended rate, will harm specific crops planted in normal rotation after harvesting the treated crop, or that interferes with regrowth of native vegetation in non-crop sites for an extended period of time.

PESTICIDE—Any substance or mixture of substances intended for controlling insects, rodents, fungi, weeds, and other forms of plant or animal life that are considered to be pests.

PESTICIDE TOLERANCE—The amount of pesticide residue that may legally remain in or on a food crop.

PHYTOPLANKTON—Microscopic plant life living suspended in water.

PHYTOTOXIC—Poisonous or injurious to plants.

POPULATION—A group of individuals of the same species occupying a habitat small enough to permit interbreeding.

POSTEMERGENCE TREATMENT—Treatments made after plants emerge above the soil surface; sometimes defined as early or late with respect to the crop.

POSTHARVEST—Application of a pesticide to the soil or plant after crops have been harvested.

PREEMERGENCE TREATMENT—Treatment made after a crop is planted, but before it emerges. (1) Contact preemergence—an application made after weed emergence, but before crop emergence. (2) Residual preemergence—an application that kills weeds as the seeds germinate or as they emerge, either before or after the crop has emerged. (Application is made before crop emergence.)

PREPLANTING TREATMENT—Treatment made before the crop is planted.

PREPLANTING SOIL INCORPORATED (PPI)—Applied and tilled into the soil before seeding or transplanting.

PUBESCENT—Hairy. Pubescence affects ease of wetting of foliage and also retention of spray on foliage.

PSI—Pounds per square inch.

RATE—The amount of active ingredient or acid equivalent applied per unit area or other treatment unit.

REGISTERED—Pesticides that have been approved for use by the Environmental Protection Agency.

RESIDUE—The amount of pesticide that is on or in the crop at the time an analysis is made.

RESIDUE TOLERANCE—The amount of pesticide residue that may legally remain in or on a food crop.

RESISTANT OR TOLERANT—Weed resistance determines the rates of herbicide or herbicide choices required for control.

RHIZOME—Underground rootlike stem that produces roots and leafy shoots.

ROSETTE—The basal or early leaves of a plant, before bolting.

SAFENER—A substance that reduces toxicity of herbicides to crop plants by a physiological mechanism.
within a few days or weeks after seed germination and emergence.

**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).

**SITE-OF-ACTION**—The location in the plant where herbicide exerts toxicity at the cellular level.

**SOFT WATER**—Water that does not contain those minerals that prevent free lathering when soap is added (see Hard Water).

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

**SOIL LAYERED**—Placement of the herbicide in a discrete horizontal zone under a lifted or tilled layer of soil.

**SOIL PERSISTENCE**—Length of time that a herbicide application on or in soil remains effective.

**SOIL RESIDUAL**—A herbicide that prevents the growth of plants when present in the soil. Soil residual effects may be temporary or relatively permanent.

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

**SOLUBILITY**—The amount of a substance that will dissolve in a given amount of liquid.

**SOLVENT**—A liquid such as water or oil used to dissolve other material such as herbicides.

**SPOT TREATMENT**—Application of sprays to localized or restricted areas.

**SPRAY DRIFT**—The movement of airborne spray particles from the intended contact area to other areas.

**SPREADING AGENT**—A substance used to improve the wetting, spreading, or possibly the adhesive properties of a herbicide spray solution.

**STAGES OF PLANT GROWTH**

- **Bolt**—A seedstalk forms following development of a rosette.

- **Cereals**—
  1) Tillering: Additional shoots are developed from the crown.
  2) Jointing: Stem internodes begin to elongate.
  3) Boot: Upper leaf sheath swells due to growth of a developing spike or panicle.
  4) Heading: Seed head is emerging from the sheath.

- **Crook**—As seedling emerges from the soil before stem becomes erect; used in beans and peas.

- **Flag**—In onions, cotyledon leaf must be free of the loop stage and before first true leaf appears; in cereals, the sheath and leaf have formed in which the head will emerge.

- **Lay-by**—Time of last cultivation.

- **Loop**—In onions, cotyledon leaf begins to emerge and before tip is free.

- **Spike**—In corn, at first emergence before first true leaf is readily observed.

**STOLON**—Aboveground runners or slender stems that develop roots and shoots and new plants at the tips or nodes as in the strawberry plant.

**STUNTING**—Retardation of growth and development of weeds or crops.

**SUBACUTE TOXICITY**—Results produced in test animals by long term exposure to repeated doses or concentrations of a substance.

**SURFACE TENSION**—Due to surface molecular forces, a drop of liquid tends to form an apparent membrane that causes it to ball up rather than to spread as a film.

**SURFACTANT**—A material used in formulations to impart emulsifiability, spreading, wetting, dispersibility, or other surface-modifying properties.

**SUSPENSION**—A liquid or gas in which very fine solid particles are dispersed but not dissolved.

**SYMPLASTIC TRANSLOCATION**—Movement of herbicide along with sugars in phloem or the phloem stream.

**SYNERGISM**—Complementary action of different chemicals so that the total effect is greater than the sum of the independent effects.

**SYSTEMIC**—A compound that moves freely within a plant so that application to one area will result in movement to all areas of the plant to exert its effect.

**TERATOGEN**—A compound having the property of causing congenital malformations in the fetus (birth defects).

**TOLERANCE** (pesticide)—The amount of pesticide chemical allowed by law to be in or on a plant or animal product sold for human consumption.

**TOLERANT**—Capable of withstanding effects. For example, grass is tolerant of 2,4-D to the extent that this herbicide can be used selectively to control broadleaf weeds without killing the grass.

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

**TOXIC**—Poisonous; injurious to animals and plants through contact or systemic action.

**TRADE NAME**—A trademark or other designation by which a commercial product is identified.

**TRANSLOCATION**—Transfer of sugars or other materials such as 2,4-D from one part to another in plants. (See Systemic.)

**VAPOR DRIFT**—The movement of vapors from the area of application to other areas.

**VOLATILE**—A compound is volatile when it evaporates or vaporizes (changes from liquid to a gas) at ordinary temperatures on exposure to the air.

**WATER DISPERSIBLE SLURRY**—A 2-phase concentrate that contains solid herbicide suspended in liquid that is capable of suspension in water.

**WATER SOLUBLE POWDER**—A finely ground herbicide powder that will dissolve in water.

**WEED**—A plant growing where it is not desired. Any plant that is a nuisance, hazard, or causes injury to humans, animals, or the desired crop.

**WEED CONTROL**—The process of limiting weed infestations or killing weeds for aesthetic, economic, public health, or other reasons.
**WEED ERADICATION**—The elimination of all live plants, plant parts, and seeds of a weed from a site.

**WEED MANAGEMENT**—A complete approach involving all appropriate weed control practices organized into a logical and effective plan for reducing detrimental aspects of weeds in cropping systems or situations.

**WETTABLE POWDER (WP)**—A finely divided dry herbicide formulation that can be suspended readily in water.

**WETTING AGENT**—A compound that, when added to a spray solution, causes the spray to spread over and wet surfaces more thoroughly.

**WINTER ANNUAL**—A plant that starts from seed germination in the fall, lives over winter, and completes its growth, including seed production, the following season. (Examples—vetch and chickweed.) Many plants commonly known as annuals can also be classified as winter annuals, depending on time of germination, etc. (Also see Annual.)

**WOODY PLANTS**—Plants that develop woody tissue.