

# Glossary

## A

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**acclimation** Preparation of the new plant for existence outside of the culture.

**acre inch/feet** Water is measured in acre feet.

**adventitious** chance or unplanned.

**adjuvant** Herbicide performance enhancer

**adenosine diphosphate (ADP)** It is converted to ATP for the storage of energy during cell metabolism.

**adenosine triphosphate (ATP)** The universal energy-transfer molecule.

**aeroponics** Roots are hung in air and sprayed with nutrient solution.

**aflatoxin** Highly poisonous substance produced by fungi in grain.

**aggregate culture** Growing in sand, gravel, marbles.

**aggregate fruit** Developed from a single flower with many ovaries.

**aggregation** Mixture of first or primary soil particles into compound particles.

**allelopathy** One plant emits chemicals from the roots that suppress growth of other plants.

**anaerobic** Absence of free oxygen.

**anaphase** Mitosis continuing - where pairs of identical chromosomes separate from each other.

**annuals** Complete life/growing cycle in less than one year and must be planted again.

**anther** Holds pollen sacs.

**apex** Tip of the leaf.

**aquaponics** Plants grown in water containing dissolved nutrients, often in combination with fish culture.

**asexual** Without sexual means.

**autotrophic** Plants having the ability to "produce" their own energy directly, being self-sufficient.

## B

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**bacteria** Microscopic, single-celled organisms.

**bactericides** May inhibit bacterial multiplication, or cause their death.

**bagasse** Fiber of the cane plant after crushing and extraction.

**banding** Material applied in a row.

**base** Bottom of the leaf and attaches to the petiole.

**beneficial insects** Help man by pollinating, providing food and other helpful materials.

**best management practices (bmp)** Making the most efficient use of animal manures without inflicting damage on the environment.

**biennials** Complete growing cycle in two growing seasons, not necessarily two years but more than one year.

**bioinformatics** Study of the inherent structure of biological information and biological systems.

**biotechnology** Application of molecular biology and genetic engineering for industrial, medical and agricultural advances or improvements or to solve problems.

**biplane** Early type of aircraft with two pairs of wings, one above the other.

**blackstrap molasses** Syrup that remains after as much sugar as possible has been extracted from sugar cane.

**blade** Main body of a leaf.

**blight** Disease or injury of plants marked by the formation of lesions, withering and death of parts.

**boll** Fruit of the plant.

**border** Irrigation used where the land is level.

**broadcast** Material distributed uniformly over the field.

**broad-leafed** Having a net-like pattern of veins in the leaves.

**budding** A bud with bark is removed from the desired plant and placed on the rootstock.

**byproduct** An incidental or secondary product made in the manufacture or synthesis of something else.

## C

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**calibrate** Mark with a gauge or instrument with a standard scale of readings.

**callus** First form of growth of a tissue culture.

**cambium** Provides diameter growth in the stem.

**cane fruit** Blueberries, strawberries and raspberries.

**capillary water** Used by plants and moves freely in the soil.

**C:N ratio** A carbon-to-nitrogen ratio of the mass of carbon to the mass of nitrogen in a substance.

**catkin** Slim, cylindrical flower cluster, with inconspicuous or no petals, usually wind-pollinated.

**cell plate** Forms the wall between the two new daughter cells in a dividing cell.

**cell wall** Made of hemicellulose and secondary cell walls made of cellulose, lignin, suberin and cutin.

**cell** Basic structural and physiological unit of crop plants, within which chemical reactions of life occur providing metabolites for plant life and for human use.

**check** Area bounded by levees [an embankment] running down slope.

**chemical** A compound or substance that has been purified or prepared, especially artificially.

**chlorophyll** A green pigment, present in all green plants and in cyanobacteria, responsible for the absorption of light to provide energy for photosynthesis.

**chloroplast** Double-membrane plastids with chlorophyll, used in photosynthesis, storing starch, and contain genetic information (DNA).

**chlorosis** Loss of normal green coloration of plant leaves.

**chlorotic** Lack green color; without chlorophyll.

**cholinesterase** Enzyme in the body that breaks down acetylcholine, which makes nerves fire, which makes the rest of the body work.

**citric acid cycle** Also known as the tricarboxylic acid cycle (TCA cycle) or the Krebs cycle; is a series of enzyme-catalyzed chemical reactions, which is of central importance in all living cells, especially those that use oxygen as part of cellular respiration.

**clay** Soil separate consisting of particles less than .002 mm in diameter.

**clones** Plants regenerated through tissue culture.

**combustion** Release of energy all at one time, like a fire or an explosion.

**complete flower** Flower that contains both male and female structures.

**compost** Organic residues or a mixture of organic residues and soil that have been allowed to biologically decompose to increase plant nutrient availability from organic materials.

**composting** Piling organic materials under conditions that cause rapid decay. Reduces the carbon-nitrogen ratio and destroys many weed seeds and disease organisms.

**compound leaf** A leaf that consists of several leaflets.

**conifer** A tree that bears cones and evergreen needlelike or scale-like leaves.

**continuous flow system** A system where nutrient solution flows constantly over plant roots; used mostly for commercial production.

**cossette** A strip or slice of a sugar beet

**cotyledon** Embryonic leaves that serve as food storing organs or develop into photosynthetic structure as the seed germinates.

**cover crop** A crop planted to prevent erosion on a soil. Cover crops can be planted on soils not currently being farmed, between crop rows, or after main crop harvest.

**clarification** Application of lime, carbon dioxide and eventually sulfur dioxide to a sugar solution.

**cristae** Each of the partial partitions in a mitochondrion formed by infoldings of the inner membrane.

**crop rotation** Practice of growing a series of dissimilar types of crops in the same space in sequential seasons for numerous benefits.

**crystallization** Juice concentrated by boiling.

**cuttings** A portion of a plant that is removed and made to form roots.

**cytoplasm** Cell contents other than the nucleus.

## **D**

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**damping-off** Plant disease occurring in excessively damp conditions, in particular the collapse and death of young seedlings as a result of a fungal infection.

**dark reaction** A light independent process that occurs when the products of the light reaction are used to form carbon-to-carbon (C-C) covalent bonds of carbohydrates.

**daughter cells** Have the same genetic makeup as parent cells.

**day-neutral** A plant that may flower under any day length.

**deadheading** Removal of old blooms.

**defoliate** Removal of green leaves to prevent staining during harvest.

**defoliation** Loss of leaves.

**degree day** Maximum temperature + minimum temperature in a day divided by 2 minus 50.

**dehiscent** Fruit that opens naturally and releases seeds when mature.

**dicot** A flowering plant with two-seed leaves or cotyledons, with xylem and phloem cells separated into zones and nonparallel venation in leaves.

**distribution system** Canals, ditches, pumps and pipelines that deliver water to an individual farm.

**divisions** How plants are ordered concerning their characteristics;

**dormant** Condition of live trees (or some plants) at rest in winter.

**dose** Refers to the dose (amount) in "milligrams per kilogram" that will kill 50% of a test group of animals.

**drip irrigation** A method of irrigation that conserves water by slowly releasing small amounts of water through emitters near the plant.

**drop spreader** An inverted triangle-shaped hopper is mounted between two wheels and usually pulled by a tractor or pickup truck.

**drupe** A fruit with a large hard seed called a stone.

**dusting** Sprinkling flowers or plants with pesticides to protect them from insects and rodents.

## E

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**electrical conductivity** Ability of the soil solution to conduct an electrical current.

**element** A simple form of matter that cannot be decomposed by ordinary chemical means. Nitrogen (N), phosphorus (P), potassium (K), carbon (C), and the like, are examples of elements.

**emitters** In drip or trickle irrigation systems, they are the water delivery mechanisms or outlets.

**endoplasmic reticulum** Structure extending throughout the cytoplasm of a cell. It functions in the transport of cell products and as a surface for protein synthesis by the ribosomes.

**energy** Capacity for doing work and for overcoming inertia.

**entomology** The study of insects.

**enzyme** A protein that catalyzes a specific chemical change without being used up in the reaction.

**epicotyl** The part of the axis of an embryo above the region of attachment of the cotyledons.

**epidemic** Any increase of disease in a population.

**epidermis** The outer layer of cells on all parts of a young plant and on some parts of older plants-for example, the leaves and fruits.

**erosion** The removal of soil material by wind or water moving over the land; erosion is a natural process. Most hills and valleys are the result of very slow erosion by water.

**ethyl acetate** Finger nail polish remover.

**eukaryote** Genetic information or DNA contained in the nucleus like most organisms.

**explants** Small pieces of plant tissue.

## F

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**Fertilization** (1) Practice of adding nutrients to soil or plants for use by plants (2) The union of the egg and sperm.

**fertilizer grade** Guaranteed minimum analysis (in percent) of the major plant nutrient elements contained in a fertilizer (refers to percent of N,  $P_2O_5$ ,  $K_2O$ , and S).

**fertilizer number** Refers to a ratio of nitrogen (N) to phosphorus (P) to potassium (K) and reflects the percentage of nutrients in the material.

**fibrous root** A type of root system characterized by many branches of fine roots.

**field capacity**-Amount of water a soil can hold against gravity; expressed as a percentage of the dry weight of a soil.

**filament** The thin stalk that attaches the anther to the rest of the flower.

**firming** Once sown, seeds should be pressed into firm contact with the medium (soil) using a tamp.

**first aid** Assistance given to a person exposed to pesticides before professional help is available.

**flagella**

**flood irrigation** On level land, water enters through a head ditch or biplane and is released into the individual checks (areas bounded by levees running downslope) by siphons, gates, or valves.

**forage crops** Feedstuffs from the leaves and stocks of plants and usually eaten by animals. These could be grasses, legumes, or other cultivated crops.

**frost susceptibility** Likely to be influenced or harmed by frost.

**fruit** A fleshy, ripened ovary of a tree, shrub, or woody vine eaten raw or cooked.

**fumigation** Pest control through gaseous pesticides.

**fungi** Microscopic plants that lack chlorophyll and conductive tissues.

**fungicide** A chemical used for controlling fungi.

**furrow irrigation** Water runs down the furrows between plant rows. Water moves to all parts of the soil by capillary action or gravity.

## **G**

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**gate** Door or valve controlling water passage.

**genetic engineering** Alteration of the genetic components of organisms by human intervention.

**genomics** Study of an organism's entire genome. The field includes intensive efforts to determine the entire DNA sequence of organisms and fine-scale genetic mapping efforts.

**glycolysis** The breakdown of glucose by enzymes, releasing energy and pyruvic acid; part of the metabolic process.

**GMO** Genetically modified organisms.

**golgi apparatus** Cell organelle, important for glycosylation and secretion in cells.

**grafting** A shoot or scion is removed from the desired plant and grafted onto the cambium layers of the scion.

**grasses** Hardy plants that require nitrogen fertilizer.

**gravity water** Water in excess of capillary water.

**green initiatives** Actions taken to reduce energy use or support the use of alternative energy sources, reduce greenhouse gas emissions and global warming or to minimize the environmental impact of a business.

**green manure** A crop grown to be turned under while still green to improve the soil.

**greensand** Sandy rock or sediment containing a high percentage of the green mineral glauconite and has a very slow K release rate.

**guaranteed analysis** The nutrient content of commercially available fertilizer is expressed as a percent.

**guard cell** Openings in the stomata during the daylight hours to permit the free exchange and release of water vapor, and the release of oxygen (O<sub>2</sub>).

## H

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**hardening off** Treatment of tender plants to enable them to survive a more adverse environment.

**harmful insects** Compete with man for food.

**hay** Cut and dried to contain a low level of moisture.

**hazard** A danger or risk.

**head** A compact mass of flowers at the top of a stem.

**herbicide** A phytotoxic chemical used for killing or preventing plant growth.

**heterotrophic** Organisms that derive their sustenance from other living creatures.

**horizon** Soil layer.

**hydroponics** Cultivation of plants in water.



**hygroscopic water** Water that bonds to the soil particles.

## I

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**immobilization** Converting an element from inorganic to organic forms in microbe or plant tissues, immediately rendering the nutrient temporarily unavailable. As nutrients recycle, elements may be released for plant uptake.

**imperfect flower** A flower missing the stamen or pistil.

**incomplete flower** Flowers that lack one or more of the four regular parts of a complete flower.

**indehiscent** Fruit that remains closed at maturity.

**inflorescence** Groups of flowers arising from a single stem.

**insoluble** A chemical compound that does not readily dissolve in water.

**inspection** Careful examination or scrutiny.

**internode** The region of the stem between any two nodes.

**interphase** The first step during mitosis called the Resting Stage - This is the period between one division and the next. Individual chromosomes are not visible but the nuclear membrane is visible.

**invertebrate** Signifies animals without backbones (no vertebrae).

**irrigation** Applying water to crops in such a way as to keep them wet but not too wet. Different irrigation methods depend on the land, sources of water, work involved and so on.

## J-K-L

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**langbeinite** Potassium-magnesium sulfate. This material ( $K_2SO_4 \cdot MgSO_4$ ) is allowed as a nutrient source if it is used in the raw, crushed form without any further refinement or purification.

**larvae** The active immature form of an insect.

**layering** A vegetative method of propagating new plants by producing adventitious roots before the new plant is cut from the parent. A portion of an attached shoot is partially buried underground where roots develop.

**LD50** Refers to the dose (amount) in "milligrams per kilogram" that will kill 50% of a test group of animals.

**legume** Plants with the characteristic of forming nitrogen-fixing nodules on their roots, in this way making use of atmospheric nitrogen.

**leucoplasts** Organelles in cells, used for the storage of oil, starch, and proteins.

**levee** Earthen dike used to enclose water.

**light reaction** Occurs in the grana when light strikes chlorophyll a in such a way as to excite electrons to a higher energy state. In a series of reactions, the energy is converted (along an electron transport-like process) into ATP and NADPH. Water is split in the process, releasing oxygen as a by-product of the reaction.

**long-day** Plants that require a day longer than its critical day length in order to flower; also called short-night plants.

## M

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**macronutrient** Chemical element necessary in relatively larger amounts (usually greater than 500 parts per million in the plant) for plant growth. These elements are C, H, O, N, P, K, S, Ca and Mg.

**margin** The edge of the leaf.

**marketing** The act or business of promoting and selling products.

**meal** The usually coarsely ground seeds of a cereal grass or pulse like cornmeal; a product resembling seed meal especially in particle size or texture like soybean meal.

**mechanical shaker** A machine designed to shake a tree causing fruit or nuts to fall off.

**media** Growing materials in which plants can be started that are loose, well drained, fine textured, low in nutrients, and free of diseases.

**meristem** A region of a plant where cells are not fully differentiated and are capable of repeated mitotic divisions.

**mesophilic** Organisms whose optimum temperature for growth is an intermediate range, between 59 and 95 degrees. Dominant microorganisms in early and late stages of composting.

**metamorphosis** In an insect or amphibian, the process of transformation from an immature form to an adult form in two or more distinct stages.

**metaphase** The third step during cell division, between prophase and anaphase, during which the chromosomes become attached to the spindle fibers.

**micronaire** A measure of fiber fineness and maturity.

**micronutrient** Chemical element necessary in relatively small amounts (usually less than 100 parts per million in the plant) for plant growth. These elements are B, Cl, Cu, Fe, Mn, Mo, and Zn.

**microtubules** Organelles made from tubulin which compose centrioles and cilia.

**midrib** The large central vein down the middle of the leaf.

**mineralization** Decomposition or oxidation of the chemical compounds in organic matter into plant-accessible forms.

**mitochondria** Cell organelles composed of an outer membrane and a winding inner membrane. A series of chemical reactions that occur on the inner membrane convert the energy of oxidation into the chemical energy of ATP.

**mitosis** The division of cells in which the genetic material of the cell is duplicated exactly.

**molasses** Syrup that remains after as much sugar as possible has been extracted from sugar cane.

**mollusk** An invertebrate of a large phylum that includes snails, slugs, mussels, and octopuses. They have a soft, unsegmented body and live in aquatic or damp habitats, and most kinds have an external calcareous shell.

**molt** Shed old feathers, hair, or skin, or an old shell, to make way for a new growth.

**monocot** A flowering plant with one seed leaf or cotyledon, xylem, and phloem contained within bundles, and parallel venation in leaves.

**mottled** Spotted or blotched leaves.

**mulch** Materials such as straw, sawdust, leaves, plastic film, and the like, spread upon the surface of the soil to protect the soil and plant roots from the effects of raindrops, soil crusting, freezing, evaporation, and so on. Apply protective materials to the soil surface.

**multiple fruit** A classification of fruit with flowers that are separated but closely clustered such as in mulberry, fig and pineapple.

## N

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**narrow-leafed** Grasses, sedges, rushes and cattails, which all have parallel veins in their leaves.

**necrotic** The death of most or all of the cells or tissue due to disease.

**nematodes** Microscopic roundworms, usually living in soil, many of which feed on plant roots. They cause galls on roots, cause root lesions, injure root tips, and sometimes cause excessive root branching. Nematodes reproduce by eggs.

**neutron moisture probe** Measures soil water content using a radioactive source.

**nitrogen cycle** Sequences of transformations in N forms among gaseous, inorganic, and organic compounds. These transformations occur in cycles and involve numerous compounds, organisms, or reactions.

**node** The region of the stem where one or more leaves are attached. Buds are commonly borne at the node.

**no-till** Planting a crop directly into an unprepared seedbed. The tillage involved in planting is nothing more than opening the soil for the purpose of placing seed at the intended depth. This usually involves opening a small slit or punching a hole into the soil. Usually no cultivation occurs during crop production. Weed control is achieved entirely by surface applied and contact herbicides. Also referred to as zero tillage or slot planting.

**nucleus** A membrane-bounded cellular body that contains the principal hereditary material.

**nut crop** Hard, bony, one-seeded fruit of a woody plant.

**nutrient availability** Amount of soil or fertilizer nutrient supply that can be immediately used by plants.

**nutrients** Fertilizer, particularly phosphorus and nitrogen-the two most common components that run off in sediment.

## O

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**organelles** The inside parts of a cell such as the golgi apparatus, nucleus, Ribosomes, microtubules and storage particles.

**organic** Chemical compounds of carbon combined with other chemical elements and generally manufactured in the life processes of plants and animals. Most organic

compounds are a source of food for bacteria and are usually combustible; derived from living organisms (plants and animals).

**organic farming** Pest and nutrient management are achieved with nonchemical methods.

**organic matter** Partially decomposed plant and animal residues in soil and soil humus.

**organic soil** Soil that contains a high percentage of organic matter or materials (greater than 15-20 percent) throughout the soil profile.

**organic standards** A framework of guidelines and regulations that govern the production of organic crops.

**ovary** Enlarged, bulbous, basal part of the pistil that bears the ovules-the egg-containing units that, after fertilization, become the seeds attached either to its central axis or to its inner wall.

**ovule** Contains the female gametes.

**oxidative phosphorylation** A series of chemical reactions occurring on the inner membrane that convert the energy of oxidation into the chemical energy of ATP. In this process the predominant energy transfer molecule is ATP.

## P-Q

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**palisade cells** Cells within the leaf may be formed into two layers: the upper, tightly packed with elongated palisade cells; and the lower, loosely packed with spongy tissue.

**palmate** In leaves, the principal veins extend from the petiole near the base of the blade similar to the bones in the hand.

**panicle** Loose, branching cluster of flowers, as in oats.

**parenchyma** Cells with thin cell walls and with large vacuoles. In leaves, parenchyma cells contain chloroplasts for photosynthesis.

**parent cells** Daughter cells having the same genetic makeup as parent cells.

**parent material** Unconsolidated and somewhat chemically weathered mineral or organic matter from which soils are derived by natural soil development processes.

**parts per million (ppm)** A ratio similar to percent, the number of parts in one million parts; percent is the number of parts in one hundred parts.

**pasture** Land covered with grass and other low plants suitable for grazing animals, especially cattle or sheep.

**pathogens** Disease-causing organisms.

**perennial** A plant or plant part that lives for more than two years.

**permanent wilting point (PWP)** Point at which no more water is available to the plant.

**peroxisomes** Organelles in the plant cell that use oxygen to carry out catabolic reactions.

**pesticide** A chemical substance used to kill or control pests such as weeds, insects, fungi, mites, algae, rodents, and other undesirable agents.

**petiole** Stalk of the leaf.

**pH, soil** Negative logarithm of the hydrogen ion concentration of a soil [ $\text{pH} = -\log (W)$ ]. Degree of acidity or alkalinity as determined by an electrode or indicator at a specified soil moisture content and expressed in terms of the pH scale (1-14); a low pH indicates acid soil, a pH of 7 is neutral, and a high pH indicates an alkaline soil.

**phloem** One of the two components of the vascular system whose primary function is the transport of manufactured products.

**photoperiod** Length of daylight.

**photoperiodism** Response of the plant to the length of daylight.

**photosynthates** Products of photosynthesis are carbohydrates such as sugars and starches (CHOs) and other complex compounds referred to collectively.

**photosynthesis** Process in a plant of making sugars for growth and respiration from the raw products of water, carbon dioxide, and, sunlight releasing oxygen.

**phototropism** Tendency of plants to "lean" in the direction of the greatest light intensity.

**pinnate** In the leaf, the secondary veins extend from the midrib, like the divisions of a feather.

**pistil** Female portion of the flower responsible for the formation of seeds.

**plasmolemma** Plasma membrane or cytoplasmic membrane.

**plumule** Young shoot.

**pollen** Microscopic grains discharged from the male part of a flower or from a male cone and contains the male gametes.

**pollination** Act of placing pollen from the male reproductive organ onto the female reproductive organ of a flower; often is carried out by bees or wind.

**pome** Fruits that have a core and embedded seeds.

**post-emergence** Application of an herbicide after weed or plant has emerged (and is usually visible) from the soil.

**post-emergent** Occurring or applied after emergence of a plant from the soil and before full growth.

**pre-emergent** Of or pertaining to seedlings before they emerge or appear above ground:

**pre-plant** Before planting.

**prophase** The second stage of cell division, before metaphase, during which the chromosomes become visible as paired chromatids and the nuclear envelope disappears.

**protective equipment** Must be worn when handling, mixing or applying the pesticide.

**proteomics** Study of genetics which refers to all the proteins expressed by a genome; involves the identification of proteins in an organism and the determination of their role in physiological functions.

**protoplast** Refers to the inside of the cell or the cellular contents.

**pruning** Removing all the old wood and leaving growth that will produce next year's crop.

**pull-type spreader** Consists of a bin mounted on a two- or four-wheeled trailer frame and pulled by a tractor or truck.

**pulp** Squeezed shreds.

**pupa** Inactive immature form of an insect.

## **R**

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**raceme** A flower cluster with the separate flowers attached by short equal stalks at equal distances along a central stem.

**receptacle** Where the apex of the pedicel upon which the organs of a flower are developed.

**radicle** Root.

**ratoon** Second harvest.

**regulations** Establish the format for pesticide labels and prescribe what information they must contain.

**remote sensing** Science of getting information about an object by acquiring data with a device not in contact with that object.

**residues** Crop materials, including roots and tops, that remain on the soil following harvest.

**respiration** Process of converting sugars into carbon dioxide, water, and energy. Often, the energy is in the form of heat.

**rhizomes** Underground stems.

**ribosomes** Where the RNA goes for translation into proteins.

**rolling** Levels the land for mowing and compacts the soil surface.

**root cap** Conductive tissue involved in plant growth.

**root hairs** Specialized cell extensions that penetrate into the openings between soil particles.

**rootbound** Restricted roots.

**rootstock** That part of a tree that becomes the root system of a grafted or budded tree.

**runners** New plants are formed at nodes by runners, which are stems from old plants. The stems grow along the ground.

**runoff** That portion of precipitation or irrigation water that flows off a field and enters surface streams or water bodies; water that flows off the surface of the land without sinking into the soil.

## **S**

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**sand** Small coarse-grained pieces of rock.

**saprophytes** Organisms that live on dead or decaying matter.

**saturation** When all of the pore (voids) spaces in the soil are full of water.

**scion** A piece of last year's growth with three or four buds; the part inserted on the understock.



**sclerenchyma cells** Thick cell walls, which make plant fibers.

**secondary growth** Follows primary growth in some plants and results in an increased girth as layers of woody tissue are laid down. Monocots and herbaceous dicots typically exhibit only primary growth.

**seed** Unit of dispersal for the new plant. It provides some protection from injury and drying and some nourishment for the young plant until it can make its own food.

**seed coat** Ovule walls develop from the seed coat.

**seedbed** Soil prepared to receive seeds.

**self-pollination** Process by which pollen is transferred from an anther to a stigma of the same flower or another flower of the same plant or cultivar.

**segmentation** Parts of an insect body.

**senescence** condition or process of deterioration with age; loss of a cell's power of division and growth.

**separation** A form of propagation by which plants that produce bulbs or corms multiply.

**shoot bud** A bud on the aboveground portion of a plant.

**short-day** Plants requiring a day shorter than its critical day length or a night longer than its critical dark period in order to flower; also called long-night plants.

**side dressing** Apply fertilizer to the side of a row for best growth results.

**sieve tube cells** Long, slender tubes with porous ends (occur only in angiosperms).

**signal word** WARNING, DANGER, CAUTION, etc.

**silage** Chopped green forage that has been allowed to ferment in the absence of air.

**silt** A very soft and flour-like soil separate (particle size).

**siphon** Tube used to convey liquid upwards

**slag** A byproduct of steel manufacturing.

**slow-release** Slowly available: Do not go readily into solution in water but will release slowly with time.

**sod** Grass that has soil and roots attached.

**sodic** Containing excessive amounts of sodium. Sodic soil contains sufficient exchangeable sodium to interfere with plant growth (ESP greater than 15 percent).

**soil** The upper layer of earth in which plants grow, a black or dark brown material typically consisting of a mixture of organic remains, clay, and rock particles.

**soil aeration** Exchanges soil and atmospheric air to maintain adequate oxygen for plant roots.

**soil air** Underground, plant roots and soil organism's use up oxygen and emit carbon dioxide resulting in soil air that has less oxygen and more carbon dioxide than the atmosphere.

**soil classification** Soils based on three dimensional entities that can be grouped together according to their similar physical, chemical, and mineralogical properties.

**soil conservation** Protection of the soil from erosion or chemical deterioration. Prevention of excessive loss of fertility by either natural or artificial means. A combination of land use and management methods that safeguard the soil against depletion or deterioration by natural or human-induced factors. A division of soil science concerned with soil conservation by preventive action.

**soil erosion** The movement of soil particles from one place to another under the influence of water or wind.

**soil profile** Refers to the arrangement and properties of the various soil layers.

**soil separates** Mineral soil particles defined by specified size limits: sand (2.0-0.05 mm), silt (0.05 mm-0.002 mm), and clay (less than 0.002 mm).

**soil solution** Water held by soils and the nutrients it contains.

**soil test** Analysis of nutrient-supplying properties of a soil sample to determine the capacity of that soil to support crop growth.

**soluble** Able to be dissolved.

**solvent** A liquid capable of dissolving. Water is the universal solvent.

**spike** A flower head made up of a central stem with the flowers growing directly on it.

**staking** Keeping plants in the correct growing position by using wires, wooden posts, or similar supports.

**stamen** Male part of a flower; it produces pollen.

**stem** Forms the major aboveground structural part of the plant; also is the attachment point for leaves, flowers, and fruit. It also contains the water and food distribution system.

**stigma** Tip of the style or pistil, especially adapted to receive the pollen grains, which is expanded into a bulb or disk or divided into two or more slender parts.

**stolons** Above ground stems.

**stomata** Pores on the bottom of a leaf through which carbon dioxide enters the plant and water vapor exits.

**strip cropping** Practice of growing crops that require different types of tillage, such as row and sod, in alternate strips, along contours or across the prevailing direction of wind.

**stunting** A virus in leaves causing a yellow mosaic pattern.

**style** Elongated stalk or neck connecting the ovary with the stigma.

**subsoil** The layer of soil just under the topsoil.

**sustainable agriculture** Agriculture that, over the long-term, enhances environmental quality and the resource base on which agriculture depends; provides for basic human food and fiber needs; is economically viable; and enhances the quality of life for farmers and society.

## T

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**taproots** Prominent primary roots from which all other lateral rootlets or secondary roots grow. They may divide, become fleshy, and often penetrate deeply into the soil.

**taxonomy** Organizational system for descriptive classification of plants.

**telophase** The final phase of cell division, between anaphase and interphase, in which the chromatids or chromosomes move to opposite ends of the cell and two nuclei are formed.

**tensiometer** Consists of a porous cup filled with water that can be buried to a desired depth in the soil in the vicinity of roots.

**terminal** When flowers or clusters of flowers are carried on the ends of the axis or branches.

**terraces** Low dams or dikes built across slopes to catch runoff water and eroded soil before they leave the field.

**thermophilic** The description of an organism that thrives at high temperatures.

**tillers** First side shoots in small grains.

**tilth** Physical condition of soil related to its ease of tillage, fitness as a seedbed, and degree of impedance to seedling emergence and root penetration.

**tissue** Large groups of organized cells of similar structure to perform specific functions in the plant. The two generalized types of tissues are meristematic and permanent.

**tissue culture** Process or technique of making plant or animal tissue grow in a culture medium outside the organism.

**tonoplast** A membrane that bounds the chief vacuole of a plant cell.

**top dressing** Uniformly apply fertilizer over the field, generally with P on established forage and N on small grains during the growing season.

**topography** Slope of the land and the position on the landscape, such as the top of a hill, a hillside, or the foot of a slope.

**top soil** Layer of soil moved in normal cultivation.

**toxic** Poisonous.

**tracheids** Elongated, conductive cells, the contents of which are non-living.

**translocation** Movement of water and dissolved compounds through the plant.

**transpiration** Process of water exiting the plant through the stomata.

**turf grasses** Collection of grass plants that form a ground cover that requires regular maintenance; for example a golf course.

**tuber** Edible portion of the plant, and botanically, stems not roots. They are stems because they contain all the morphological features of stems.

**turgid** Condition in which a cell or plant is fully expanded by hydrostatic pressure exerted on the cell wall by the protoplast.

**turgor** Stiffness in the cells.

## U

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**umbel** Type of inflorescence

## V

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**vacuole** A space or vesicle within the cytoplasm of a cell, enclosed by a membrane and typically containing fluid.

**variety** A plant group different in the wild from the general species. It is often used for varieties named from the general species.

**vector** Carrier of disease.

**vegetable** A plant or part of a plant used as food.

**vegetative** Period when the plant grows vigorously and rapidly.

**vertebrate** Signifies animals without backbones (no vertebrae).

**vesicle** Air-filled swelling in a plant.

**viruses** pathogenic particles that infect cells of plants and animals.

**volatile** Evaporates rapidly, as in chemical.

**volatilization** Diffusion into the atmosphere.

**volatilize** Cause (a substance) to evaporate or disperse in vapor.

**volunteer plants** Plants that may grow following harvest or the next season without being planted.

## W

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**warm-season** Refers to plants that are usually killed by frosts and require much warmer temperatures to grow properly. They are planted later in the spring.

**water erosion** Erosion by water is caused by raindrops, surface flow and gully flow. Water erosion is a selective process in which the organic matter and finer soil particles are removed first. This selective feature of soil erosion rapidly destroys productivity of cultivated lands.

**water holding capacity** Ability of a soil to hold water.

**water-logged soil** A condition of poor soil aeration with an oxygen level around zero.

**watershed** Surrounding land area that drains into a lake, river, or river system.

**weed** A plant growing where it is not wanted.

**whorl** Three or more leaves at each node.

**wilt** When plants lose water more rapidly than they take it up, they wilt. Life processes slow, and growth may even stop.

**wilting point (WP)** Plant will not revive unless immediately irrigated.

**wind** The perceptible natural movement of the air, especially in the form of a current of air blowing from a particular direction.

**wind erosion** Erosion by wind is common in dry areas where soils are often bare of vegetation and high wind velocities are common.

## X

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**Xeric** Referring to the tropical zone.

**xylem** One of two components of the vascular system whose primary function is to transport water and soil nutrients.

## Y

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**yield** Amount of crop produced in response to cultural practices.

**yield potential** Level of crop productivity that can be obtained under specific physical, chemical, and environmental conditions.

## Z

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**zygote** Cell formed by the union of the male and female gametes, the new organism developing from this cell.