

Greenhouse Tomato Growers' Glossary



Producing greenhouse tomatoes, like many endeavors, has its own world of terminology. But because of the integration of many different fields—horticulture, botany, plant physiology, plant pathology, entomology, and others—there are more terms in this field than perhaps any other agricultural pursuit. Also, greenhouse tomato production is rooted in European and Asian countries and was well established in Holland, England, and Japan, before being transported to Canada and eventually to the United States. So, some words have a more international base.

For all of these reasons, this Greenhouse Tomato Growers' Glossary was assembled to help growers with learning the language of hydroponics and greenhouse tomato production. For more specific information, refer to other Mississippi State University Extension Service publications. All of these publications are online at <http://extension.msstate.edu/publications>, or you may get copies from your local MSU Extension office:

Publication 1828 *Greenhouse Tomato Handbook*

Publication 2766 *Budget for Greenhouse Tomatoes*

Publication 1879 *Environmental Control for Greenhouse Tomatoes*

Publication 1861 *Greenhouse Tomatoes: Pest Management in Mississippi*

Publication 1995 *Starting Vegetable Transplants*

Publication 2037 *Fertigation: The Basics of Injecting Fertilizer for Field-Grown Tomatoes*

Publication 2975 *Tomato Troubles: Common Problems with Tomatoes*

Helpful Terms to Know

abiotic: non-living.

bacterial streaming: the movement of bacteria out of plant tissues into water; this phenomenon is used as a test to determine if bacteria are present in symptomatic plant tissues.

bacterium: a microscopic, one-celled organism that reproduces by fission and lacks chlorophyll; many different bacteria are capable of causing disease in tomatoes; diseases caused by bacteria include bacterial canker, bacterial wilt, pith necrosis, bacterial speck, and bacterial spot.

biocontrol: see **biological control**.

biological control: the use of an organism to help manage pathogens and/or pests.

biotic: living.

blade: the extended, flat part of a leaf, not including the petiole.

blossom-end rot: a disorder characterized by a sunken, leathery brown or black spot on or near the bottom of a tomato fruit; usually from lack of water or not enough calcium in the fruit.

bullish: a very vegetative plant with thick, leathery, dark-green leaves and little or no fruit; may be caused by overfertilization with nitrogen or genetic off-type.

calyx: the green, pointed structures beneath flower petals and at the top of the fruit; composed of individual sepals.

canker: a sunken, discolored area of diseased plant tissue that may be dry and corky in texture.

chlorosis: yellowing of normally green tissue caused by the lack of chlorophyll; can be caused by disease, lack of nutrients, shading, age, or other factors.

cluster: a group of flowers or fruits that set at the same point on the plant.

compound: a type of leaf composed of many parts or leaflets; non-compound leaves are called simple.

condensation: water droplets accumulate on the inside of the plastic covering the greenhouse and then drip onto plants, resulting in artificial rain on the crop; can also form on leaf and fruit surfaces, promoting disease.

cool pad: see **wet wall**.

corolla: all of the flower petals considered together.

diagnosis: identification of the cause of an abnormality; the first step in disease management.

disease: an abnormality in a plant resulting from infection by a pathogen.

disinfectant: an agent that kills or inactivates pathogens on greenhouse or plant surfaces.

disorder: an abnormality in a plant caused by an abiotic agent such as air pollution, drought, herbicides, nutritional deficiencies or toxicities, and pH problems; disorders are not infectious

dissemination: movement of inoculum from diseased plants.

drench: a pesticide treatment that is applied to the soil, or medium, in which a plant is growing.

efficacious: provides effective control.

electroconductivity (EC): a measurement of how much electrical current a solution can conduct; corresponds to amount of fertilizer dissolved in solution.

emitter: device that puts water/fertilizer mixture directly into the growing medium.

epidemic: widespread, severe outbreak of disease.

fertigation: mixing or putting fertilizer into the irrigation water so fertilizer is delivered with irrigation water.

foliar spray: a pesticide treatment that is sprayed on the leaves of plants.

fruit: the tomato that is eaten.

fruiting bodies: fungal reproductive structures in which spores are produced.

fungicide: a chemical or biological product applied to plants to prevent or stop infection by fungal pathogens.

fungus: an organism that lacks chlorophyll and the ability to manufacture its own food and typically produces mycelium; many fungi are capable of causing disease in tomatoes; diseases caused by fungi include Botrytis gray mold, leaf mold, target spot, and timber rot.

glazing: the covering over a greenhouse; this can be polyethylene, polycarbonate, glass, or other transparent materials.

hand: see **cluster**.

head: the top of a plant.

honeydew: a sugary substance deposited on leaves after insects such as aphids and whiteflies feed on the plant. Often a "sooty mold" grows on the honeydew.

host: a plant variety or species that is capable of being infected or fed upon by a particular pathogen or insect when favorable environmental conditions are present.

hot spot: a small group of plants in one location in the greenhouse with a noticeable problem, such as whiteflies or russet mites.

hydroponic: using water to grow plants without soil; soil-less culture.

hyphae: threadlike fungal growth that forms the mycelium of a fungus.

infection: when a pathogen establishes a parasitic relationship with a host.

inoculum: any part of a pathogen that is capable of infecting a host.

insecticide: a chemical or product used to control insect pests.

internode: the part of the stem between leaves.

integrated pest management (IPM): the use of a variety of methods to manage an insect or disease rather than relying only on one method, such as releasing only one biological control agent or only treating with a pesticide.

IPM: see **integrated pest management**.

leaflet: the subdivisions of a leaf; the tomato leaf is compound, so it is made up of many leaflets.

lean and lower: leaning plants over and dropping them when they are taller than the support wire; it is important to lean when lowering to avoid stem breakage; this needs to be repeated every 2 weeks or so in mature plants.

lesion: a localized area of symptomatic plant tissue.

liquid concentrate: a formulation of pesticide sold in concentrated liquid form; it must be diluted with water before being applied.

media: material in which plants are grown, such as perlite, pine bark, and peat moss.

medium: singular form of **media**.

mho, millimho, micromho: units of electrical conductance used to estimate fertilizer concentration to determine how strong a fertilizer solution has been mixed; there are 1,000 millimhos in a mho, and 1,000,000 micromhos in a mho.

mycelium: a mass of fungal hyphae.

necrosis: death of plant tissue; tissue generally turns brown or black.

nematode: a microscopic worm-like animal; many nematodes are capable of causing damage to plants.

NFT: see **nutrient film technique**.

node: the point on the stem where a leaf is attached.

nutrient film technique (NFT): using plastic sheeting and water to grow plants hydroponically.

oedema (edema): a blistered appearance on the lower leaf surface due to excess water that the plant cannot use, resulting in enlarged plant cells that burst; this can also appear on stems. This tissue eventually becomes corky.

OMRI: see **Organic Materials Review Institute**.

oomycete: a fungus-like organism commonly called a water mold capable of causing disease; diseases caused by oomycetes include *Phytophthora* and *Pythium* root rot.

Organic Materials Review Institute (OMRI): a national nonprofit organization that determines which products are suitable for use in organic production; www.omri.org.

parasite: an insect or other organism that searches for a pest species and deposits its eggs into that species; the immature parasites develop within the pest, eventually killing it.

parts per million (ppm): the concentration of a fertilizer or any other material in water. *Note: 10,000 parts per million = 1%.*

pathogen: a living organism that can infect a plant and cause disease; disease-causing plant pathogens include various species of bacteria, fungi, nematodes, oomycetes, and viruses.

pedicel: the "flower stalk" that holds a single flower.

peduncle: the "fruit stalk" that holds a cluster of fruit.

petiole: the "stem" of a leaf; attaches the plant stem to the leaf blade.

pH: measurement of how acidic or basic (alkaline) a solution is; less than 7 is acidic; more than 7 is basic.

phloem: food-conducting vascular tissues of a plant.

pollinate (pollination): transfer of pollen from anther (male flower part) to stigma (female flower part); with greenhouse tomatoes, this is done with an electric pollinator or with bumblebees.

predator: an insect or other organism that actively searches for and eats a pest species, helping to control or limit its population.

relative humidity (RH): the amount of water in the air divided by the amount of water the air could hold if saturated, at a particular temperature; expressed as a percentage.

root or root ball: the belowground portion of a plant; a mass of roots at the base of the plant that can fill the container (bag, bucket) in which plants grow.

sanitation: the removal and/or destruction of plant debris from the greenhouse and the cleaning and decontamination of tools and greenhouse structures/surfaces.

sclerotia: compact masses of hyphae, usually in the form of a hard, round or irregularly shaped structure, which can survive adverse conditions.

scouting: regularly checking a crop for insect and disease infestations to determine pest population levels.

seedling: a very young plant.

sepal: the individual parts of a **calyx**; green, pointed structure beneath the flower petal and at the top of the fruit.

sign: the visible presence of a plant pathogen; examples include mushrooms, fungal mycelia, sclerotia, and bacterial ooze.

solubility limit: the most fertilizer that can be dissolved in water at a given temperature; the solubility limit increases as water warms.

spindly: a plant with thin stems, small leaves, and long internodes; leggy; opposite of stocky.

spore: a reproductive structure of a fungus (like a seed).

stem: the main trunk of the plant; has roots attached at the base and leaves, flowers, and fruit attached to aboveground portion; tomatoes are usually pruned to one main stem.

symptom: indications of a plant abnormality due to an abiotic or biotic agent; in the context of disease, a plant's reaction to a pathogen; examples include cankers, chlorosis, leaf deformation, lesions, necrosis, rots, and wilts.

systemic: a pesticide that is absorbed by the plant, either through the roots or leaves, and translocated to other plant parts, where it controls insect or disease pests; also refers to a pathogen, such as a virus, that spreads inside the plant.

toxicity: a compound's ability to injure a plant, such as too much of a nutrient or chemical.

transpiration: the flow of water from the plant to the atmosphere, such as evaporation of moisture from the plant through the leaf surfaces.

transplant: a young plant past the seedling stage; replanting a small plant to a larger container.

truss: see **cluster**.

turgid: the stiffness of a plant caused by internal water pressure; opposite of wilted; it is best to remove shoots (suckers) or leaves when plants are turgid so you can easily snap off shoots or leaves.

vapor pressure deficit (VPD): the difference between the actual water vapor pressure and the saturation of water vapor pressure at a particular temperature; at a low VPD, transpiration may be too low; at a high VPD, transpiration may be too high; you can manipulate VPD to make plants more vegetative or more generative.

vascular discoloration: black, brown, or reddish-brown coloration of the xylem and phloem tissues evident upon splitting the stem of the plant; often associated with wilt diseases.

virus: a microscopic organism made up of a strand of nucleic acid surrounded by a protein coat; many viruses are capable of causing disease in tomatoes; diseases caused by viruses include tomato yellow leaf curl, tobacco mosaic, and tomato mosaic.

water-soluble package: a formulation of pesticide sold in water-soluble packages that have a premeasured amount of dry, water-soluble insecticide or fungicide; the package dissolves when you put it in water, releasing the pesticide it contains.

wet wall: an evaporative cooling system, also called cool pad system; cools by pulling water-saturated air into the greenhouse that vaporizes, absorbing heat in the process; the exhaust fans then remove the warmed vapor.

wettable granule: a formulation of pesticide sold as a dry granule that must be dissolved in water before being applied.

wettable powder: a formulation of pesticide sold as a dry powder that must be dissolved in water before being applied.

wilt: loss of turgidity in plant tissue; may be caused by a lack of water, too much water, or infection by certain pathogens.

xylem: water-conducting vascular tissues of a plant.

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