

Glossary

A

- abaxial** - directed away from the stem of a plant; pertaining to the lower surface of a leaf
- ability** - ability is what you are doing with what you have
- abiotic** - non-living; of non-biological origin
- abnormal** - different in some manner from other specimens in the taxon
- abscission** - the shedding of leaves or other parts as the result of physical weakness in a specialized layer of cells (abscission layer) that develops at the base
- acid soil** - a description of the soil's pH. Acidic soils have a pH below 7.0
- acorn** - the nutlike fruit of oaks
- acropetal** - describes the development of structures or movement of materials in succession from the base towards the apex
- actinomyce** - (literally "ray fungi") any member of the order Actinomycetales; the name is often used to refer specifically to those species which form mycelium
- acuminate** - tapering to a point
- acuminose** - rather less gradual than acuminate
- acute** - ending in a sharp point (usually of leaves); tapering without curvature to a point; forming an angle of less than 90 degrees
- acute symptoms** - see shock symptoms
- adjuvant** - material added to improve some chemical or physical property (e.g., of a plant protectant) or a biological property (e.g., to improve antibody response to an antigen)
- adventitious** - not assimilated or yet established
- adventitious bud** - latent or dormant bud on a stem or root
- aerobe** - an organism that requires free oxygen for respiration
- aerobic** - with the qualities of an aerobe
- agent of disease** - an organism or abiotic factor that causes disease; a pathogen
- aggressiveness** - of a plant pathogen: relative ability to colonize and cause damage to plants
- alkaline soil** - with a pH value of more than 7.0
- alternate** - arising from different points and on opposite sides, of an axis. Only one leaf per node
- alternate host** - one of two kinds of plants on which a parasitic fungus (e.g., a rust) must develop to complete its life cycle
- anaerobic** - not requiring free, molecular oxygen for respiration

anatomy - anatomy is the science of the orderly structure, shape, or construction of an organism and its parts

angiosperms - plants that have covered seeds such as oaks and maples

anion - an anion is a negatively charged particle

annual - A plant that completes its life cycle (from seed to seed) within a single growing season

antagonism - an ecological association between organisms in which one or more of the participants is harmed or has its activities limited

antagonist - an agent or substance that counteracts the action of another

anther - The pollen bearing terminal part of a stamen

anthracnose - any of various plant diseases, particularly those caused by fungi of the Melanconiales, in which discrete, dark-colored, necrotic lesions develop on the leaves, stems, and/or fruits

antibiotic - substance used to inhibit the growth of micro-organisms, including bacteria and fungi

apex - (pl. apices) the top or tip of a structure, such as a leaf or stem

apical - of the apex

apical bud - The bud at the tip of a stem

apical dominance - controlling influence of the apical bud over the growth of a stem, which restricts the development of lateral buds. If the tip is removed apical dominance is broken, and lateral shoots below will grow more vigorously, competing to become the new leader

appressorium - An enlargement on a hypha or germ tube that attaches itself to the host before penetration takes place. (Pl. appressoria.)

attenuate - narrowing gradually to a point

attenuated - diminishing in width

auricle - an ear-shaped structure

auriculate - ear-shaped; with the leaf base composed of two rounded lobes

avirulent - Not exhibiting virulence; nonpathogenic

avoidance - Principle of plant disease control marked by deliberate actions to take advantage of environmental factors and time unfavorable for disease development

axial - belonging to, around, in the direction of, or along an axis

axial parenchyma - The symplast is the network of connected living cells; axial and radial parenchyma in wood, the cambial zone, living cells in the inner phloem, phloem rays, and the phellogen. Axial parenchyma are cells aligned vertically.

axis - the central shoot of a compound leaf, cone, inflorescence, root, etc.

B

bactericide - a substance that kills bacteria

bacteriostatic - able to inhibit the growth and reproduction of at least some types of bacteria

balled and burlapped (B&B) - a field plant whose root system has been balled and burlapped for transplanting

bare root - a plant dug as bare root for transplanting

bark - the surface layer of the trunk and branches of woody plants. Bark is made up of an outer periderm and an inner phloem.

basal - originating from the base

basipetal - successive from apex to base

berry - a fleshy indehiscent pulpy, succulent fruit with immersed seeds

bicrenate - crenate with the teeth also crenate

binomial - a binomial means two names, a genus and a species. (See "taxonomy")

biocontrol - see biological control

biological control - the deliberate use by humans of one species of organism to eliminate or control another

biotic - living agents, (e.g., insects, fungi, bacteria, etc.)

bipinnate - doubly or twice pinnate. (bipinnately compound)

biserrate - serrate with the teeth also serrate

blade - the broad, flat part of a leaf

blight - a disease characterized by rapid and extensive death of plant foliage. A general term applied to any of a wide range of unrelated plant diseases. (e.g., chestnut blight, fireblight, late blight, halo blight)

blotch - a disease characterized by large, and irregular in shape, spots or blots on leaves, shoots, and stems

bract - a modified leaf, usually at the base of a flower which resembles a petal

branch collar - the thickened ring at the base of a branch

broadcast application - application by spreading or scattering on the soil surface

broom - in plant pathology: A symptom in which lateral branches proliferate in a dense cluster on the main branch (witches'-broom)

brown rot - decay caused by a group of fungi that digest primarily cellulose

bud - a condensed shoot containing an embryonic leaf, leaf cluster, or flower

buffer - organic matter or a carbonate and phosphate compound in the soil or water that preserves hydrogen-ion concentrations and resists change in pH value.

C

callus - a mass of thin-walled, undifferentiated plant cells, developed as the result of wounding

calyx - a protective structure around a flower formed by the sepals collectively

cambium layer - the layer of tissue capable of producing new cells to increase the girth of stems and roots

canker - an imprecise term usually used for a plant disease characterized (in woody plants) by the death of cambium tissue and resulting loss and/or malformation of bark, or (in non-woody plants) by the formation of sharply delineated, dry, necrotic, localized lesions on the stem. The term "canker" may also be used to refer to the lesion itself, particularly in woody plants

canopy cover - a measurement of how much of an area is covered by the leaves in the crown of its trees

capacity - capacity is what you have as a result of your genetic code; a potential source for some future action or product

capsule - thin walled dry fruit containing 2 or more seeds and usually dehiscent

carrier - an organism that bears an infectious agent internally but shows no marked symptoms of the disease caused by that agent

catkin - compact usually pendulous spike of unisexual flowers, as in birches, willows, poplars, oaks, walnuts

causal agent of disease - that which is capable of causing disease

cell - the structural unit of an organism

cellulose - a substance in plants made up of long, twisting chains of glucose molecules

central leader - The central, usually upright, stem of a plant.

chlorophyll - green substance in leaves and other plant parts that can trap the energy of the sun and create carbohydrates through photosynthesis

chlorosis - the loss of chlorophyll from the tissues of a plant, resulting from microbial infection, viral infection, the action of certain phytotoxins, the lack of light, to magnesium or iron deficiency, etc. Chlorotic tissues commonly appear yellowish

clay - a minute soil particle less than .002 mil. in diameter

cleft - a leaf cut in about halfway to the midrib as in maple, liquidambar, and sycamore

clone - a plant produced by asexual reproduction, e.g.: from cuttings

clustered - multiple leaves, flowers or fruits seemingly arising from a common juncture; crowded, cannot easily determine if they are alternate or opposite in orientation

CODIT – acronym for Compartmentalization Of Decay In Trees. CODIT is a model of compartmentalization.

codominant leaders - competing stems of roughly equal size

commensalisms - symbiosis in which neither organism is injured; one or neither may be benefited

compartmentalization - the processes that result in isolation of wounded or diseased xylem from normal xylem by the formation of chemically and anatomically specialized tissue around the damaged zone

compound leaf - leaf whose blade is divided into two or more leaflets

compression wood – wood in conifers that is strengthened on the lower side of the lean or the problem

cone - conical woody fruit consisting of seed-bearing, overlapping scales around a central axis
conical - cone-shaped
conifer - cone-bearing tree (gymnosperm) with needle-like, linear, or scale-like leaves
conk - the basidiocarp (fruiting structure) of a wood-decaying fungus, usually a polypore
conoidal - imperfectly conical
contact parenchyma - connect axial and radial parenchyma.
cordate - a leaf base that extends in a curving, dual lobe-like fashion below the top of the petiole; heart-shaped
core-skin hypothesis - Dr. R.C. Hardwick termed the core-skin hypothesis, which states that as new growth increments or "new trees" grow over old increments or "old trees," the "young trees" become "skin" over the aging "core." As trees age, the ratio of "core" to "skin" increases.
cork - outer bark containing suberin, which is long chains of fatty acid
cotyledon - an embryonic leaf within or newly emerged from a seed
crenate - having rounded teeth at the leaf margins
crispate - curly, in the manner of parsley
cristate - in the form of a crest; irregularly notched
crotch - The angle between two branches, or between a branch and a trunk
crown - parts of the tree above the trunk, including leaves, branches and scaffold, limbs
crown spread - the area covered by the branches and foliage of a tree
cultivar - a cultivated plant variety or cultural selection
cuneate - wedge-shaped; triangular, with narrow part at point of attachment
cuspidate - tapering evenly to a hard point
cuticle - a thin, waxy layer on the outer wall of epidermal cells consisting primarily of wax and cutin
cv – see cultivar
cytokinins - phytohormones that stimulate metabolism and cell division

D

decay - the gradual decomposition of dead organic matter. (1)
deciduous - trees that shed their leaves regularly. They may be cold-deciduous and drop their leaves when the weather becomes cool (as in Autumn) or drought-deciduous, dropping their leaves when the water supply is low
decurrent - running down the stem; facing downwards
decurrent habit -plant form typical of angiosperm trees and shrubs which are more round-headed and spreading, lacking a main leader to the top of the plant
defoliation - loss of leaves

dentate - having marginal sharp teeth which are roughly perpendicular to the margin

desiccate - to dry out

diagnostic - a distinguishing characteristic important in the identification of a disease or other disorder

dicots - having two seedleaves

dieback - progressive death of shoots, branches and roots generally starting at the tip

diffuse-porous - angiosperms such as maple, birch, poplar and cherry, which have vessels of about equal size and diameter arranged at about equal distances from each other throughout the growth increment

dioecious - having male and female flowers on separate plants (e.g. holly)

disease cycle - of a disease caused by a biotic agent: the cyclical sequence of host and parasite development and interaction that result in disease, in reproduction or replication of the pathogen, and in the readying of a new generation of the parasite for infection

disease - an abnormal condition of a plant in which its physiology, morphology, and/or development is altered under the continuous influence of a biotic or abiotic agent

dispersal - spread of a pathogen within an area of its geographical range

dissemination - see dispersal

dormancy - the state of temporary cessation of growth in plants

dormant buds - on some trees, smaller buds form to the sides of larger buds. The smaller buds may remain dormant for several growing periods

dorsal - back or upper surface. (7)

doubly serrate leaves - large teeth and small teeth alternating

downy mildew - plant disease caused by certain members of the Peronosporales. Downy mildews are characterized by the formation of superficial hyphal growth in which, typically, individual spore-bearing structures can be distinguished

drupe - (stone fruit) a fleshy one-seeded fruit which contains a single stone which in turn contains the seed

dynamic mass - the part of the tree containing living cells (symplast)

E

earlywood - in cross section, earlywood or springwood is the xylem in the growth increment that formed in the spring.

ectomycorrhizae - type of mycorrhizae caused by the infection of the outermost cells of a tree root by mycorrhizal fungi (e.g. oak, pine, and hickory)

ectoparasite - a parasite that remains external to the host's cells or tissues

elements - see "essential elements"

elliptical - having a relatively broad middle and tapering at both ends

emarginated - having a shallow notch at the apex

endemic - restricted to a certain geographical location

endocarp - the innermost layer of the pericarp

endomycorrhizae - type of mycorrhizae caused by the infection of the internal cells of a tree root by mycorrhizal fungi (e.g. magnolia, maple, apple, birch, ash, elm)

endoparasite - a parasite that lives intracellularly or within the tissues of the host

entire - having a smooth margin (without teeth); may or may not be lobed

enzyme - a protein produced by living cells that can catalyze a specific organic reaction

epidemic - a change in the amount of disease in a population in time and space

epidemiology. 1. The study of the interrelationships between a given pathogen, the environment, and groups or populations of the relevant hosts. 2. The study of epidemics.

epidermis - the outer layer of cells on a plant structure

epiphyte - an epiphytic organism.

epiphytic - growing on other plants (usually trees,) without deriving or contributing nutritional benefit from them

eradication - control of plant disease by eliminating the pathogen after it is established or by eliminating the plants that carry the pathogen

escape - failure of inherently susceptible plants to become diseased, even though disease is prevalent

esophagus. In nematodes: The portion of the alimentary canal between the buccal capsule, or stoma, and the anterior portion of the intestine

essential elements - the 17 chemical elements essential for healthy growth of trees: Carbon, Hydrogen, Oxygen, Nitrogen, Phosphorus, Potassium, Calcium, Sulfur, Magnesium, Copper, Chlorine, Boron, Nickel, Molybdenum, Zinc, Iron, Manganese

etiology - the study of cause; that phase of plant pathology dealing with the causal agent and its relations with the susceptible plant

evaporative cooling - the absorption of heat from the atmosphere during evapotranspiration.

evapotranspiration - the loss of water through a plant's leaves, where it evaporates. One large tree can release hundreds of gallons of water into the atmosphere in one day!

evergreen - plants that retain foliage throughout the year

exclusion - the principle of plant disease prevention in which the pathogen is prevented from entering a given region

excurrent habit - the cone-shaped form typical of many conifers and a few angiosperms with a clearly identified central leader and growing point at the top of the plant

exfoliate - peeling bark from a branch or trunk

exudates - material that has passed from within a plant structure to the outer surface or into the surrounding medium; as in leaf exudate, root exudate, etc.

F

facultative parasite - an organism that normally lives as a saprophyte but under certain conditions can live as a parasite

facultative saprophyte - a mainly parasitic organism with the ability to survive for a part of its life cycle as a saprophyte and be cultured on artificial media

falcate - sickle shaped; asymmetric.

family - a group of related genera taxonomically classified within an order

fascicle - a tight bundle or cluster, as in the needle leaves of pines

fibers - thick, tough cells that are vertically aligned in wood and provide strong mechanical support for trees

filament - the part of the stamen that supports the anther; a thread-like structure

fireblight - a bacterial disease that results in blackened blossoms and stems

fissure - bark that is furrowed and ridged, or splitting lengthwise

fitness - the ability of an organism to survive and reproduce; the ability of an organism to pass its genes to the next generation

flabellate - fan-shaped

flush cut - improper pruning cut that removes the branch collar

fruit - the seed-bearing organ

fruiting body - any multi-hyphal structure that bears or contains spores

fumigant - a gas or volatile substance that is used to disinfest certain areas of various pests

fungicide - a chemical or physical agent that kills or inhibits the growth of fungi. (Note some substances termed "fungicides" are fungistatic in their action)

fungistat - a substance that prevents fungal growth without killing the fungus

fungus - a eukaryotic, heterotrophic organism whose usually walled, threadlike cells absorb nutrients (Pl. fungi.)

fusiform - spindle-shaped; tapering at each end

G

gall - an abnormal plant structure formed in response to parasitic attack by certain microorganisms (bacteria, fungi, viruses) or insects. Galls may develop either by localized cell proliferation or increase in cell size

genus - a taxonomic rank above species and below family; the generic name of an organism is the first of the binomial (Pl. genera.)

gibberelic acid - a plant hormone that stimulates the growth of shoots and leaves

glabrous - smooth; hairless

gland - a secreting cell or group of cells on the surface of a plant structure

glaucous - having a bluish gray waxy surface

graft union - the region where rootstock and scion come together; there can be slightly deformed growth at the union that is noticeable
growth increment - an increment of growth, either in elongation or girth, of dicot plants.
growth regulator – agent that regulates the growth of a tree
growth - an increase in mass.
gummosis - a plant disease in which the lesions exude a sticky liquid
gymnosperms – plants (conifers) with naked seeds

H

haustorium - a specialized branch of a hypha formed inside a host cell by certain plant-parasitic fungi (especially obligate parasites) in order to obtain nutrients. (Pl. haustoria.)
health - the ability to resist strain
heartwood - age-altered wood that has a greater protection capacity than sapwood
hemicelluloses – component of wood that is made up of shorter chains of sugars than cellulose.
herbaceous - non-woody plant, having the characteristics of an herb
hormone - a chemical produced by organisms to trigger or regulate certain processes
host - a plant that supports the growth and development of the parasite that has infected it
hybrid - a specimen produced by the sexual reproduction of 2 plants of different species or subspecies
hypersensitivity - the expression of extreme reactivity by a plant in response to a potential parasite or pathogen, the plant's response commonly serving to limit or prevent parasitization/disease
hypha - filamentous part of a fungus, usually septate and consisting of several cells in linear succession. (Pl. hyphae.)

I

imbricate - overlapping in a tile-like manner
immune - cannot be infected by a given pathogen
incised - intermediate between toothed (dentate or serrate) and lobed, being a sharply inward cut leaf (the inward cuts are called incisions)
increment borer - A tool used to extract a core of wood from a tree. Using this technique, the age and condition of trees can be determined without destroying the tree.

incubation period - the period of time between penetration of a host by a pathogen and the first appearance of symptoms on the host
indehiscent - not opening to release its contents
infect - to begin or continue an interactive, usually pathogenic, relationship with the host
infection court - a site in or on a host plant where infection can occur
infection - the interaction of parasite with host; the beginning of that interaction
inflorescence - the flowering part of a plant
inoculate - to introduce a microorganism into an environment suitable for its growth; to bring a parasite into contact with a host
inoculum - the population of microorganisms introduced in an inoculation; the units of a parasite capable of initiating an infection
intercellular - between cells
internodal - pertaining to sections of stem between leaves or buds
internode - section of stem between leaves or buds
intracellular - within or through the cells
ion - a charged particle.

J

juvenile - chronologically speaking, it is an organ or tissue that is not fully developed; developmentally speaking, a plant that is unable to produce flowers (reproduce); contrast with mature which is able to reproduce

L

lanceolate - tapering in shape, like a spear-head; elliptical with a length:breadth ratio of between 3:1 and 6:1

latent infection - infection unaccompanied by visible symptoms

latent period - The period between infection and the appearance of new inoculum

latewood - in cross section, latewood or summerwood, is the xylem in a growth increment which has become lignified (became wood) in the summer

leader - the main, usually central, stem of a plant

leaf - usually flattened, usually green plant structure being most often the primary organ of photosynthesis

leaf bud - a bud from which only leaves and stems develop

leaf scar - point on a stem where a leaf was attached

leaf spot - a self-limiting lesion on a leaf

leaflet - a segment of a compound leaf

legume - a dry pod-like fruit, belonging to member of the Pea Family, usually dehiscent, opening along longitudinal suture.

lenticel - a small, usually corky area on a stem or other part of a plant, which acts as a gas exchange pore

lesion - a localized area of diseased or damaged tissue

lichen - a thallus consisting of an alga and fungus intermixed and living in a symbiotic relationship

life cycle - the complete succession of changes undergone by an organism during its life. A new cycle occurs when an identical succession of changes is initiated

lignify - become woody

lignin - a component of cells that adds strength and rigidity

linear - narrow with untapering margins and a length:breadth ratio between 6:1 and 3:1

lingulate - strap-shaped; longer than linear but shorter than fasciarate, with a length:breadth ratio of between 6:1 and 12:1

loam - textural class name for soils having moderate amounts of sand, silt and clay

lobe - a portion of a leaf that projects outward and divides the leaf into distinct parts, but not enough to make them separate leaflets; lobes may be rounded or pointed

local infection - an infection affecting a limited part of a plant

lunate - crescent-shaped; half-moon shaped

M

margin - the edge of a leaf blade

mature - chronologically speaking, it is an organ or tissue that is fully developed; for example, ripe; developmentally speaking, a plant that is able to produce flowers (reproduce); contrast with juvenile which is unable to reproduce

meristem - a parenchyma cell that has the ability to divide and differentiate (growing point)

mesophyll - cells in-between tissues of a leaf

microorganism - a living individual of microscopic size, such as a bacterium or protozoan

midrib - the central rib of a leaf

mildew - a fungal disease of plants in which the mycelium and spores of the fungus are seen as a whitish growth on the host surface

monocots - possessing only one cotyledon (seedleaf)

monoecious - a plant bearing separate male and female reproductive organs on the same plant.

motile - capable of movement

mottle - a diffuse form of the mosaic symptom in plant leaves in which the dark and light green are less sharply defined. This term is frequently used interchangeably with mosaic

mulch - a protective covering that is spread on the ground around plants to inhibit evaporation and weed growth, control soil temperature, enrich the soil, or prevent the dispersal of pathogens.

multistemmed - tree or shrub with several main stems arising from the ground

mushroom - a fleshy fruiting body of a fungus, especially of a basidiomycete of the family Agaricaceae

mycelium - a mass of hyphae, often used to denote all hyphae comprising a thallus (Pl. mycelia.)

mycology - the study of fungi

mycoplasma - a wall-less prokaryotic microorganism of the class Mollicutes

mycoplasma-like organism - see phytoplasma

mycorrhizae - a specialized root structure resulting from a symbiotic relationship between a fungus and a higher plant (Pl. mycorrhizae.)

N

necrosis - localized death of cells or tissues

necrotic - dead

needle - a slender, leaf usually in the shape of a needle or awl commonly found in some conifers, such as Junipers; contrast with scale-like

nematicide - a chemical compound or physical agent that kills nematodes

nematode - more or less elongate, spindle-shaped, worm-like animals ranging in size from less than a millimeter to several meters in length, living as saprophytes in soil or water or as parasites of plants or animals

nitrogen fixation – conversion of nitrogen from the air to a soluble ionic form by the action of the bacteria and actinomycetes within the nodules on the roots

node - the point on a stem from which leaves, shoots or flowers arise

nomenclature - a system of names, or naming, as applied to the subjects or study in any art or science, especially in botany and zoology

normal - typical of its taxon; of features held in common between specimens in the taxon

nut - A dry, usually large, indehiscent fruit with a thick, hard shell, usually one-seeded, and edible

nutrient - a substance that contains an element with an energy source (e.g. carbohydrate) and an element without (e.g. nitrogen)

O

- obligate parasite** - an organism that is incapable of living as a saprophyte and must live as a parasite
- oblique** - (usually of a leaf) having unequal sides; almost (but not quite,) symmetrical as in the leaf bases of elm and hackberry
- oblong** - broadly elliptical with blunt ends
- obovate** - inversely ovate, broader at the tip, narrow near the stalk.
- obtuse** - terminating in a blunt, unpointed end; forming an angle of more than 90 degrees
- oedema** - intumescence or blister formation because of an increase in intercellular water (also edema.)
- opposite** - leaf arrangement in which leaves arise in pairs at each node; not alternate or whorled
- orbicular** - circular or globed, as in the shape of a leaf
- order** - a group of related families taxonomically classified within a class
- organ** - a specialized plant structure performing a particular function
- oval** - broad-elliptic, about 1 1/2 times as long as broad and round at the ends
- ovary** - a hollow organ at the base of the carpel of a flower in which the female plant's gametes are produced
- ovate** - egg-shaped; oval, with one end more pointed than the other
- ovoid** - egg-shaped; ovate
- ovule** - the part of the ovary of seed plants that contains the gamete; an unfertilized seed

P

- palmate** - three or more leaflets radiating fan-like from a common base (for example, Horsechestnut)
- palmately compound** - see palmate
- panicle** - a branching cluster of flowers esp. where formed by a series of racemes branching from a main axis
- parasite** - an organism living in or on another living organism (host) from which it extracts nutrients
- parenchyma** - a tissue composed of living, thin-walled cells that can continue to divide even when mature; parenchyma cells usually leave intercellular spaces between them
- pathogen** - an agent (biotic or abiotic) that causes plant disease
- pathogenicity** - the capability of a pathogen to cause disease
- pathology** - 1. The study of disease. 2. The abnormal condition that constitutes disease
- peduncle** - the stalk of a flower, inflorescence or fruit

peltate - shield shaped, with the stalk attached near the middle instead of the base or margin

pendulous - hanging or drooping, can refer to plant form or parts, like branchlets or inflorescences

penetration peg - in some plant parasitic fungi: The peg-like hypha emerging from an appressorium that penetrates the epidermal cell wall

perennial - a plant that normally lives more than two growing seasons and, after an initial period, produces flowers annually

perfect - a flower having both male and female parts (bisexual)

pericarp - the part of a fruit formed from the wall of a ripened ovary

periderm - outer bark or periderm is mostly dead cells lined with suberin or cork. Periderm is made up of a phellogen, phelloderm, and phellem.

petal - the floral modified leaves of a flower that comprise the corolla

petiole - leaf stalk connecting leaf blade to the stem

petiolule - in compound leaves, the attachment structure between a leaflet and the stem-like structure of the compound leaf (rachis)

pH - The reciprocal of the hydrogen ion concentration of a medium. A value on a scale of 0 to 14 gives a measure of the acidity or alkalinity of a medium; pH values of 0 to 6.5 indicate acidic conditions, a pH value of 7.0 is neutral and pH values greater than 7.0 are alkaline.

phellogen - also known as the bark cambium, is the outer most part of the symplast

phenology - the study of periodic biological processes, or the timing of natural processes and phenomena, such as onset of growth, bud swelling, leaf formation, cambial growth, wood and bark growth, root growth, and development of non-woody roots, the timing of root-fungus associations, shedding of leaves and non-woody roots, etc

phenols - basic molecules in angiosperms that polymerize to form protection substances

phloem - food-conducting tissue, consisting of sieve tubes, companion cells, phloem parenchyma, and fibers that transports nutrients from sources to sinks

photosynthesis - the process whereby sunlight is converted into energy by chlorophyll (involving chlorophyll, light energy, carbon dioxide and water)

physiology - the science of the orderly functions, activities, and intrinsic characteristics of an organism and its parts

phytoplasma - prokaryotic, plant parasitic microorganism resembling a mycoplasma but not yet isolable in pure culture or characterized taxonomically

phytotoxic - toxic to plants

pinna (pl. pinnae) - the primary division of a compound leaf

pinnate (pinnately compound) - leaflets or venation arranged on either side of a central axis, resembling a feather.

pistil - the stigma, style and ovary collectively; the female reproductive organs

pith - tissue in the center of trunks, branches, and twigs, made up of large cells

plasmodesma - fine protoplasmic thread connecting two protoplasts and passing through the wall separating the two protoplasts (Pl. plasmodesmata.)

pod - dry, 1 celled fruit, splitting along natural grooved lines, with thicker wall than a capsule, see legume

pollination - the process of fertilization whereby pollen is transferred from the stamen to the stigma

polymorphic - of very variable shape

pome - fleshy indehiscent fruit from a compound ovary

primary infection - the first infection of a plant by a pathogen emerging from a dormant stage in its life cycle (overwintering or oversummering)

primary inoculum - the overwintering or oversummering pathogen or its propagules that cause primary infection

propagule - any disseminative unit of an organism (e.g., a spore, a mycelial fragment a sclerotium)

prostrate - lying horizontally

protectant - any chemical agent that interacts with a pathogen on the plant surface to inhibit infection before it takes place. Non systemic

protection - a principle of plant disease control in which a barrier is placed between susceptible and pathogen (e.g., the use of protective chemical dusts or sprays)

pterate - winged, e.g.: dipterate - 2-winged, tripterate - 3-winged

puberulous - somewhat pubescent

pubescent - covered with short sort hair.

pyriform - pear-shaped; more elongated than turbinate

R

raceme - a flower cluster composed of individual florets equally spaced along a stem - often cymose

rachis - the stem or petiole-like central axis of a pinnately compound leaf, connecting the petiolules to the petiole

radial parenchyma - living cells arranged perpendicularly in wood

rams horns - woundwood that curls inward on tree cavities; commonly causes cracks

reaction wood - specialize wood formed in response to a defect or a lean

reniform - kidney-shaped; an oval with the ends curved around in the same direction

resistance - the ability of an organism to exclude or overcome, completely or in some degree, the effect of a pathogen or other damaging factor

respiration - a process where the energy produced through photosynthesis is released in cells to run the processes of life

reticulate - forming a network (often of leaf-veins); multiply divided

retuse - a rounded termination with a small notch forming two small lobes; slightly emarginate

rhizome - an underground plant structure from which both roots and shoots emerge directly

rhizomorphs - a macroscopic, typically rope-like strand of compacted tissue formed by certain higher fungi. Rhizomorphs often are enduring structures that can remain dormant under adverse conditions

rhizosphere - an environment regarded, variously, as (a) that region of the soil modified as a result of the uptake and deposition of substances by a growing root, (b) the root itself, together with that volume of soil which it influences, (c) the root surface together with that region of the surrounding soil in which the microbial population is affected by the presence of a root

rib - a leaf-vein; a ridge of plant-tissue thicker than its surrounding

ring-porous - wood in angiosperms (e.g. oak and elm) that have large diameter vessels in the first portion of the growth increment and vessels of smaller diameter later in the growth increment

rouging - the removal of diseased plants in order to prevent the spread of the disease

root - a plant structure usually providing a plant with anchorage and the ability to absorb water and nutrients from the soil

root ball - the clump of soil containing the roots of a transplanted tree

rootstock - the portion of a grafted plant that provides the root; grafted plants typically consist of a scion, which develops into the shoot or crown and a rootstock that provides the root system; rootstocks may include a significant length of stem, called standards, commonly used for weeping trees or shrubs

rosette - an abnormal condition in which the leaves form a radial cluster on the stem

rot - the softening, discoloration, and often disintegration of a succulent plant tissue as a result of fungal or bacterial infection

rust - 1. Fungus of the class Urediniomycetes. 2. Any of various plant diseases caused by members of the Urediniomycetes or by species of *Albugo*. The diseases are called "rusts" because many of the causal agents form rust-colored spores on affected plants

S

sagittate - arrowhead-shaped, with the basal lobes turned downward

samara - a dry, one-seeded fruit bearing a single wing

sanitation - principle of plant disease control involving removal and burning of infected plant parts and decontamination of tools, equipment, hands, etc.

saprobe - an organism that obtains its nutrients from non-living organic matter (commonly dead and decaying plant or animal matter) by absorbing soluble organic compounds. (Also saprotroph.)

saprophyte - see saprobe

Sapwood - (xylem) the living wood (symplast) of pale color next to the bark. it is formed from the cambium and conducts water and minerals from the roots to the leaves.

scab - any of a wide range of unrelated plant diseases having a roughened, crustlike diseased area on the surface of a plant organ (e.g., apple scab)

scaffold branches - the main framework branches on a tree

scald - a necrotic condition in which tissue is usually bleached and has the appearance of having been exposed to high temperatures

scale-like - small appressed leaf or bract; contrast with needle-like

scion - the shoot portion of a rootstock-scion graft

scorch - "burning" of leaf margins as a result of infection or unfavorable environmental conditions

scribing – trimming away damaged tissue around a wound to enhance wound closure

secondary infection - any infection caused by inoculum produced as a result of a primary or a subsequent infection; an infection caused by secondary inoculum

seed - the sexually-produced embryo and associate protective and nutritive structures capable of developing into a plant

semi-evergreen - having some leaves deciduous and some leaves persistent throughout the winter, with the degree of persistent leaves determined by the harshness of the winter season

senescence - decline or degeneration, as with maturation, age, or disease stress

serrate – (saw-toothed) having marginal teeth that lean toward the tip of the leaf; margins can be singly or doubly serrated

serrulate - minutely serrate

sessile - without an obvious attachment structure, such as a leaf attached to a stem without an obvious petiole

shot hole - a symptom in which small, diseased fragments of leaves fall off, leaving small holes in their place

sieve plate - perforated wall area between two phloem sieve cells through which they are connected

sieve tube - a series of phloem cells forming a long cellular tube through which food materials are transported

sign - visible manifestation of a causal agent of plant disease (e.g., fungal spores or other fungal structures, bacterial ooze)

simple - a leaf with a single blade, undivided, unbranched, not compound

sink – the location where a substance is used or incorporated and cannot move further (e.g. growing twigs that use photosynthates)

sinuate - lyrate, but with the lobes more equally sized

sinus - the space between two lobes of a leaf

soil - a substrate made up of sands, silts, clays, decaying organic matter, air, water and living organisms

sooty mold - a fungus of the family Capnodiaceae and of certain other families of the order Dothideales. The organisms grow epiphytically, utilizing honeydew, and form dark, spongy, hyphal mats on the surfaces of certain plants

source - the position of origin of a substance (e.g. leaves that produce photosynthates)

spatulate - spoon-shaped

species - a taxonomic category of similar individuals capable of interbreeding to produce offspring classified within the same species; The second word of a species name (e.g., *virginiana* in the species *Quercus virginiana*).

spore - a discrete sexual or asexual reproductive unit, usually enclosed by a rigid wall, capable of being disseminated

sporulate - to produce spores

sporulation. The process of producing spores

spur - a short shoot or branchlet bearing flower buds

stamen - the male part of a flower, consisting of a threadlike filament and a pollen-bearing anther

staminate - of a male flower possessing stamens but not pistils

starch - the major energy storage material of trees

static mass - the dead expanding core (apoplast) of trees

stellate - star-shaped

stigma - the female organ that receives and is fertilization by pollen

stipule - an appendage at the base of the petiole, often in pairs and sometimes called auricles (ears)

stoma - aperture (leaf pore) in the epidermis of a leaf, stem, or fruit, bound by two guard cells and functioning in gas exchange (Pl. stomata.)

strain - when a system operates beyond the means in which it was designed

stress - a condition where a system, or its parts, begins to operate near the limits for which it was designed

striate - having longitudinal lines, such as bark

suberin - cork - phellem

sucker - a shoot that arises at or below ground level from a plant's root or underground stem

susceptibility - the inability of a plant to resist the effect of a pathogen or other damaging factor

symbiosis - a mutually beneficial association of two or more different kinds of organisms

symplast - a network of highly ordered, connected living axial and radial parenchyma cells in sapwood and inner bark

symptom - a visible abnormality in a plant that results from disease

symptomatology - the study of symptoms of disease and signs of pathogens for the purpose of diagnosis

synergism - the concurrent parasitism of a host by two pathogens in which the symptoms or other effects produced are of greater magnitude than the sum of the effects of each pathogen acting alone

systemic - of a chemical or a pathogen: Spreading internally throughout the plant body.

T

taxon - taxonomic group of any rank

taxonomy - the science of classifying organisms in established categories; giving organisms a name, a binomial, based on their characteristics

tension wood - reaction wood that is formed on the upper side of a lean or defect in hardwoods

terminal - at the tip of a stem or branch

thorn - one of various sharp and pointed outgrowths of plants that can arise from stems, leaves, or fruits; botanically, a modified twig which has tiny leaf scars and buds and is usually pointed and sharp; other sharp structures are prickles and spines which are technically different from thorns and each other, but which have the same overall effect

tissue - a group of cells of similar structure which performs a special function

tolerance - the ability of a plant to sustain the effects of a disease without dying or suffering serious injury or crop loss

tomentose - covered in tomentum

tomentum - matted woolly threads on the surface of leaves and stems

toothed - the condition of a margin broken into small projecting segments, either serrations, dentations, or crenations

toxicity - the capacity of a compound to produce injury or death

transpiration - the loss of water vapor from the surface of leaves and other aboveground parts of plants

trees - highly compartmented, shedding, woody, perennial, are usually tall, single-stemmed, and long-lived.

tridentate - forked into three points

truncate - with a flat base or apex, perpendicular along the margin to the midrib

trunk flare - widening at the base of the trunk due to trunk taper and buttress roots

turgid - swollen

tylosis. A balloon-like outgrowth from a xylem parenchyma cell that expands into and blocks the lumen of a xylem vessel or a tracheid (Pl. tyloses.)

U

undulate - wavy along a margin

V

var. - variety

variegated - marked with various colors

vector - a living agent that transmits a pathogen from an infected plant to an uninfected one

vegetative -referring to non-reproductive structures or growth

vegetative reproduction - asexual reproduction

vein -a vascular tube in a leaf, typically referring to any within the blade except for the midrib

venation - the arrangement of veins within a leaf

vernation - the arrangement of leaves within a leaf bud

vessel - a xylem element or series of such elements whose function is to conduct water and mineral nutrients

vigor - the capacity to resist strain; a genetic factor

virulence - the degree of pathogenicity of a given pathogen

virulent - capable of causing a severe disease; strongly pathogenic

virus - infectious units comprising either RNA or DNA enclosed in a protective coat

vitality - the ability to grow under the present conditions; dynamic action

W

waxy - having a thick cuticle

wetwood - wood infected by bacteria (usually anaerobic)

white rot – wood decay caused by fungi that typically degrade lignin

whorl - a ring of leaves etc. around a stem

wilt - a disease (or symptom) characterized by a loss of turgidity in a plant (e.g., vascular wilt)

witches' broom - an abnormal form of plant growth, most common in woody plants, in which there is a profuse outgrowth of lateral buds to give a "witches' broom" appearance. The shoots may be thickened and may bear abnormal leaves

wood - a highly ordered connection and arrangement of living, dying and dead cells that have walls of cellulose, hemicelluloses and lignin

X

xylem - a plant tissue consisting of tracheids, vessels, parenchyma cells, and fibers; functions in conduction of water and minerals and in structural support of the plant

Y

yellowing - a symptom characterized by the turning yellow of plant tissues that were once green

yellows - any of a wide variety of plant diseases in which a major symptom is a uniform or non-uniform yellowing of leaves and/or other plant components. Yellowings may be caused by fungi (e.g., celery yellows), viruses (e.g., sugar beet yellows virus), bacteria (e.g., coconut lethal yellowing), protozoa (e.g., hartrot), spiroplasmas or phytoplasmas

Z

zoospore - an asexual, motile spore that bears one or two flagella