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# Glossary

**AG – (Anastomosis Group)** A sub-grouping of a fungal species based on the ability of closely related isolates to exchange nuclear material via the fusion of fungal strands (anastomosis). The seedling disease pathogen, *Rhizoctonia solani* is divided into anastomosis groups – AG4 affects cotton while AG8 affects wheat.

**APOTHECIA** - A cup-shaped spore-bearing structure produced by some fungi. The apothecia of the pathogen that causes Sclerotinia boll rot of cotton are small (5-8mm across), 'golf tee'-like structures that grow at the soil surface out of buried fungal survival structures called sclerotia.

**ASCOSPORES** - Sexual spores produced by a particular group of fungi. The ascospores produced in apothecia are forcibly ejected and then dispersed by wind.

**ASEXUAL SPORES** – Spores produced vegetatively (ie. 'without sex'). The spores and the 'parent' organism are genetically identical.

**ASYMPTOMATIC** - Without symptoms. An asymptomatic infection is one where the pathogen is present but there are no apparent symptoms indicating its presence.

**BIOCIDES** – A broad term for man-made chemicals that are used to control pests, weeds, insects and diseases caused by fungi or bacteria. Pesticides, herbicides, fungicides, insecticides, bactericides, rodenticides etc. may all be referred to as biocides.

**BIOFUMIGATION** – The use of toxic gases produced naturally in the soil by plant roots or decaying plant residues to control the spores of disease-causing fungi that are present in the soil.

**CHLAMYDOSPORES** – Thick-walled, single-celled, asexual spores produced by some fungi to aid survival in the soil and/or between seasons.

**CONIDIA** – Asexual spores produced by fungi. Conidia are often produced in large numbers and may be single-celled or multi-celled. They are often short-lived and adapted for wind or splash dispersal.

**CORTEX** – The outer tissues of the stem or root between the vascular bundles and the epidermis.

**DEW PERIOD** – The time period or number of consecutive hours, during which there is free water ('dew') on the leaf surface.

**DISEASE** – A set of symptoms incited by a biological agent (a pathogen). Symptoms of a disease may include death, destruction or discolouration of host tissue or abnormal growth or differentiation.

**DISPERSAL** – The means of spread or transfer of the cause of a disease (the inoculum of the pathogen) from one area to another or from one host plant to another host plant.

**EPIDERMIS** – The outermost, single-celled layer of tissue ('a skin') covering all plant parts.

**EPIPHYTES** – Non-parasitic or parasitic organisms such as bacteria, fungi, yeasts and algae that live and multiply on plant surfaces.

**FORMAE SPECIALES** – (f.sp.) A sub-grouping (special form) of a fungal species based on specificity for a particular host plant. (See Fov)

**FOV** – A convenient abbreviation for the full name of the fungus that causes Fusarium wilt of cotton – *Fusarium oxysporum* f.sp. *vasinfectum*

**GIRDLING** – Encircling. An infection that girdles a stem or root is one that completely encircles the stem or root.

**HYPERVIRULENT** – More virulent than all previously identified races or strains. The hypervirulent races of the bacterial blight pathogen are able to overcome a combination of several resistance genes in the plant whereas all previously identified races are only able to overcome single resistance genes.

**IMMUNE** – Completely resistant to infection by a plant pathogen. Immunity is normal as most plants are immune to most pathogens.

**INCIDENCE** – The proportion (%) of plants or bolls that are affected by a particular disease as opposed to

disease severity which is a measure of the mean intensity or extent of the symptoms on each plant or boll.

**INOCULUM** – Infective material or spores. That part of a pathogen that is produced on or in infected host tissue and is able to infect a new host or healthy host tissue. Inoculum is usually in the form of spores or sclerotia but may also be in the form of bacteria or fungal fragments growing and surviving in plant residues or seed.

**LESION** – An area of dead or dying host tissue.

**METABOLITE(S)** – Chemicals that are end-products resulting from a natural sequence of biochemical reactions. Breakdown products.

**MICROSCLEROTIA** – See Sclerotia.

**MOTTLE** – A pattern of light and dark areas across a leaf as seen in leaves of plants affected by Verticillium wilt.

**MYCORRHIZA** – A mutually beneficial association between a fungus and the roots of a plant. The fungi that form a mycorrhiza grow throughout the cortex of the plant roots and out into the surrounding soil where they function as an extension of the plant's root system. The plant provides a source of carbohydrate for the fungus while the fungus assists plant uptake of the less mobile nutrients such as phosphorus. Most plant species require mycorrhizal associations for normal healthy growth. (See VAM)

**PATHOGEN** – An organism that can cause disease symptoms to develop. A parasite. Fungi are the most common plant pathogens but plant diseases can also be caused by bacteria, nematodes, viruses, phytoplasmas, etc.

**PHYTOPLASMA** – A class of microorganisms that can cause disease in some plants. A phytoplasma has no organised nucleus and no true cell wall. Several diseases once thought to be caused by a virus have been shown to be caused by a phytoplasma. Phytoplasmas can only grow inside other organisms and require an insect vector to move them from plant to plant.

**RACE** – A genetically identical, sub-grouping of a pathogen species based on an ability to overcome a particular gene, or set of genes, for resistance in a plant host.

**RESISTANT VARIETY** - The infection process, colonisation and/or the production of spores by the pathogen is impeded by some aspect of the host plant's anatomy and/or physiology. Plant resistance may be manifest as smaller spots, fewer spots/leaf, reduced spore production, etc.

**RHIZOSPHERE** – The biologically active zone surrounding plant roots that includes the root surface and the adjacent soil. A 3-dimensional site of intense microbial activity stimulated by substances exuded from the root.

**ROGUE** – To remove and destroy infected or abnormal plants from within a crop or plot in order to prevent either further spread of the disease to nearby healthy plants or increased contamination of the site.

**SAPROPHYTE** – An organism that lives and multiplies on dead or dying organic matter.

**SCLEROTIA** - Thick-skinned, survival structures (usually black), produced within or on infected tissue by some fungi. Sclerotia vary in size from a few cells (microscopic microsclerotia) up to 5 to 10cm across and enable the fungus to survive for long periods in the soil or in crop residues or during adverse weather conditions.

**SECONDARY INFECTION** – Colonisation of an established lesion by saprophytic organisms that grow rapidly and reproduce abundantly on the dead and/or dying plant tissue produced as a result of pathogen activity.

**SENESCE / SENESCENCE** – Yellowing or reddening and death of plant tissue as a result of advanced maturity / old age.

**SEVERITY** - The intensity or extent of symptoms or the proportion of tissue with symptoms, on each plant or boll. The severity of leaf spot diseases may be expressed as the percentage of leaf area affected. Disease severity may also be described and assessed using an arbitrary scale eg. A scale of 0 –5 where 0 =no symptoms, 1 = minor symptoms, 2 = obvious symptoms, 4 = severe symptoms and 5 = complete death.

**SPORE** – A single-celled or multi-celled reproductive unit that is capable of infecting host tissue. Spores may be produced sexually, asexually or vegetatively and many fungi produce two or more spore types.

**STEP-POINT METHOD** – A method for randomly selecting plants within a field. While walking at an angle across the field select the plant nearest the right foot at the completion of a pre-selected number (eg 30) of steps. Continue across the field until the required number of plants has been assessed/sampled.

**STRAIN** – A sub-grouping of a pathogen species based on genetic uniformity. Derived from a single spore.



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**SURVIVAL** – Longevity. Ability to remain viable or infective over time when exposed to seasonal and/or environmental influences. A pathogen may be adapted to survive in soil, in or on crop residues or in seed. Some pathogens produce spores that only remain viable for a few hours while others produce spores or survival structures that remain viable for many years. Some pathogens are able to survive as saprophytes in the absence of a susceptible host.

**SUSCEPTIBLE** – Having no resistance to infection by the pathogen. The infection process, colonisation and production of spores by the pathogen is relatively unimpeded by the host plant.

**SYMPTOMS** – The set of visible signs indicating a deviation from normal, healthy growth, appearance and productivity. Symptoms may include death, destruction or discolouration of host tissue or abnormal growth or differentiation. Symptoms may be caused by (i) infection by a biological agent such as a fungus, bacteria, nematode, insect or virus, (ii) a nutritional imbalance such as a deficiency or toxicity, (iii) the impact of adverse environmental conditions such as frost, lightning, drought, waterlogging etc, or (iv) the impact of unwise decisions by the grower such as incorrect fertiliser placement, root pruning during cultivation, sowing depth, herbicide usage at planting, etc.

**SYSTEMIC** – Active throughout the plant despite application, or induction, to only a part of the plant. Active in a part of the plant remote from the point of application. Distributed throughout the host plant via the vascular system.

**TOLERANT / TOLERANCE** – Plant growth and/or productivity relatively unaffected by the presence of disease.

**TRANSECT** – An identified or fixed path across a field allowing representative sampling or assessment that may be repeated over time.

**VAM** – A convenient abbreviation for Vesicular Arbuscular Mycorrhiza. A particular type of mycorrhiza that is characterised by the production of vesicles and arbuscules by the fungus in the cortex of the plant root. (See MYCORRHIZA)

**VASCULAR SYSTEM** – The system of vessels that carries water and mineral salts within the plant ie from the roots to the leaves and shoots and from the leaves to the fruiting structures. A VASCULAR WILT is an infection of the vascular system.

**VECTOR** – An organism that carries a pathogen from an infected plant to a healthy plant. Insects, nematodes, man, parasitic plants, etc. may act as vectors for plant pathogens while remaining unaffected by their presence.

**VEGETATIVE COMPATIBILITY GROUP (VCG)** – A sub-grouping of a fungal species based on the ability of closely related isolates to exchange nuclear material via the fusion of fungal strands (hyphae).