

Tropical Forages

Glossary

A

a.e.: acid equivalent.

a.i.: active ingredient (= active constituent, or a.c.)

AAR: average annual rainfall.

abaxial: facing away from the axis (usually the lower side of a leaf surface). cf. adaxial

abscission: the normal shedding from a plant of an organ that is mature or aged, e.g. a ripe fruit, an old leaf. adj. abscissile, vb. abscise.

accession: a catalogue entry in the order of acquisition, e.g. BRA-xxxxx (Brazil), CPI xxxxx (Australia), PI xxxxx (USA).

acid soil: a soil whose pH is below 7 - in practice, often applied to soils of pH <6.5. See acidification. Soil is regarded as 'very acid' when the pH is <5.0.

acidification: a reduction in soil pH through leaching and various chemical processes. In extremes this reduces the availability of molybdenum, phosphorus and sulphur but increases the availability of the toxic elements, manganese and aluminium.

acropetal: arising or developing in a longitudinal sequence beginning at the base and proceeding towards the apex. cf. basipetal.

acuminate: tapering to a protracted point.

acute: terminating in a distinct but not protracted point, the converging edges separated by an angle less than 90 degrees.

adaxial: facing towards the axis (usually the upper side of a leaf surface). cf. abaxial.

ADF: acid detergent fibre - a laboratory estimate of the less digestible fibre in the plant, and includes cellulose, lignin, ADIN and acid-insoluble ash. ADF is highly correlated with cell wall digestibility. ADF is the best indicator of the fibre requirement for healthy rumen fermentation. cf. NDF.

ADIN: protein or nitrogen that has become chemically linked to carbohydrates to form an indigestible compound. Also referred to as an insoluble crude protein.

adventitious: arising in abnormal positions, e.g. roots arising from the stems; buds arising from other than axils of leaves.

aerenchyma: a parenchymatous tissue with large intercellular spaces within which gasses may be stored and diffused, commonly found in floating plants.

agroforestry: a farming system that integrates crops and/or livestock with trees and/or shrubs.

agronomy: the integration of soil and plant sciences in growing crops and pastures.

alkaline soil: a soil with a pH >7; in practice, often applied to soils of pH >7.5.

allelopathy: suppression of other species by production of phytotoxic chemicals that inhibit germination and growth of other plants. adj. allelopathic.

alley cropping: an agroforestry intercropping system in which crops are grown between rows of shrubs and trees, closely planted within the rows.

alley farming: see alley cropping.

allogamous: fusion of female and male gametes derived from genetically dissimilar individuals. cf. autogamous.

allopolyploidy: the multiplication of chromosomes through hybridization by two different species. i.e. the addition of dissimilar sets of chromosomes. e.g. an allotetraploid is a polyploid derived by the doubling of chromosomes in the hybrid of two diploid species. cf. autopolyploidy.

allotetraploid: see allopolyploidy.

alluvial soil: soils formed from sediments deposited on land by streams as in a river flood-plain.

amelioration: the action of making better; improvement, e.g. liming acid soils.

amphicarpic: of a plant when bearing both aerial and subterranean fruits. Also amphicarpous. cf. geocarpic.

amplexicaul: of a leaf base, stem -clasping.

andromonoecious: having bisexual and male flowers, on the same plant.

aneuploid: having a chromosome number that is not an exact multiple of the haploid number.

annual: a plant which completes its life cycle within one year. cf. perennial.

annulus: a ring.

anther: the pollen-bearing part of a stamen. The stamen comprises the anther and filament (stalk).

antimitotic: a chemical that inhibits or prevents mitosis. ® External web link.

apical: at the apex or tip.

apomict: a plant that produces viable seed through apomixis.

apomixis: clonal reproduction through asexual seed formation.

apospory: the development of 2n gametophytes, without meiosis and spores, from vegetative, or non-reproductive, cells of the sporophyte.

appressed: pressed closely against a surface.

arboricide: herbicide for controlling woody weeds.

arcuate: curved like a bow.

areole: a space marked out on the surface. adj. areolate: divided in distinct spaces.

aril: a fleshy outgrowth around the funicle on the seed coat (testa). adj. arillate.

article: of a pod , segment bounded by constrictions between the seeds.

articulate: jointed; having joints where separation may occur naturally.

ascending: growing upward after an oblique or semi-horizontal beginning.

asl: above sea level.

asymmetric: not divisible into similar halves in any plane.

attenuate: tapering gradually to a slender point.

AU: animal units. Considered to be one mature cow of approximately 450 kg, either dry or with calf up to 6 months of age, or their equivalent, based on a standardised amount of forage consumed. cf. DSE (dry sheep equivalent).

auricle: an ear-shaped appendage at the base of a leaf. adj. auriculate.

autogamous: fusion of female and male gametes derived from genetically similar sources, usually the same individual. cf. allogamous.

autopolyploidy: the replication of chromosomes by a pure-breeding line to a number of simple multiple of that basic to the species. e.g. an autotetraploid may be derived from a diploid parent by treatment with the alkaloid colchicine which has the effect of preventing the formation at mitosis of two nuclei, thus leaving in one nucleus the two double sets of chromosomes. cf. allopolyploidy.

awn: a bristle-like appendage, usually terminating an organ, e.g. on the tip or back of the lemma of a grass floret. adj. awned.

axil: the angle between a leaf or bract and the axis bearing it. adj. axillary.

B

basipetal: developing, in sequence, from the apex towards the base. cf. acropetal.

biosystematics: use of data (e.g. cytogenetic or biochemical) to assess taxonomic relations especially within an evolutionary framework.

bipinnate: of compound leaves, having primary and secondary rachises. cf. pinnate, tripinnate.

bisexual: = hermaphrodite ; bearing both male and female organs in the same flower.

blade plough: an implement comprising a very large sweep or wing blade used for the removal of tree regrowth by underground cutting of roots.

bole: the trunk of a tree up to the first branch. cf. canopy.

bract: a leaf-like or scaly structure subtending a flower or inflorescence.

bracteole: a small bract-like structure borne singly or in pairs on the pedicel or calyx of a flower.

browse: the foliage, tender branches or twigs of trees and shrubs, used as feed for cattle and other animals.

C

caducous: falling unusually early.

caespitose: growing in tufts.

calcareous: of soils, relating to a high content of free calcium carbonate, making the soil alkaline.

calyx: the sepals of a flower collectively, usually less conspicuous than the corolla.

calyx tube: a tube formed from the bases of sepals. cf. hypanthium.

cambium: the layer of cells in a plant from which growth of woody tissue and bark takes place (between the xylem and the phloem).

campanulate: bell-shaped.

canopy: the branches and foliage of a tree above the bole.

capitate: clustered together in a dense head.

carinate: keeled.

carpel: the structure that bears and encloses the ovules in flowering plants.

caryopsis: the fruit of a grass (grain).

CEC: Cation Exchange Capacity.

chartaceous: papery.

chasmogamous: pollinated when the flower is open. cf. cleistogamous.

chimera (chimaera): a tissue-complex of genetically distinct cells, the result of a mutation within certain cells of a meristem.

chromosome: a thread-like structure in the nucleus of a cell, containing a linear sequence of genes.

ciliate: fringed with fine hairs (cilia), as the margins of some leaves.

clay: soil particles <0.002 mm in diameter; also used to define a soil textural class. cf. sand, silt. Clayey soils have higher water retention capacity than sandy or loamy soils.

cleistogamous: self-pollinated, but the flowers never open. cf. chasmogamous.

climbing: growing upward, but not self-supporting.

conjugate: joined in pairs.

conservation: preservation of forages to provide feed when other feed is not available or of low quality, e.g. hay, haylage, silage.

coppicing: the cutting back of a tree or shrub to encourage numerous slender stems to develop from the cut stem.

cordate: heart-shaped (often applied to bases only).

coriaceous: leathery.

corolla: the petals of a flower collectively; usually soft and coloured conspicuously.

cover crop: a crop planted to prevent soil erosion and to suppress weeds; can also improve soil and/or provide forage.

CP: crude protein - an estimate of the protein value of a feedstuff, calculated by multiplying the nitrogen percentage in the dry matter by 6.25.

crenate: a leaf margin with small, rounded teeth; scalloped.

crocodile seeder: specialised planter used for sowing into a rough, unprepared seedbed. © External web link.

culm: the aerial stem of grasses, sedges and rushes, often terminating in an inflorescence.

cuneate: wedge-shaped. © Illustration.

cut and carry: systems where feed, crop residues and/or litter is cut and carried to penned or tethered livestock.

cyanobacteria: commonly called blue-green algae. A photosynthetic bacterium capable of nitrogen fixation in some species.

cyme: a determinate inflorescence in which each flower, in turn, is formed at the tip of a growing axis and further flowers are formed on branches arising below it. adj. cymose. cf. raceme.

cystolith: mineral concretions, usually of calcium carbonate on a cellulose stalk.

D

deciduous: falling seasonally, e.g. of the leaves or bark of some trees. cf. evergreen.

decumbent: reclining or lying flat on the ground but with the ends ascending.

definite: of an inflorescence, ending in a flower or an aborted floral bud. cf. determinate.

defoliation: strictly, the removal of plant leaves, but generally the removal of herbaceous material, e.g. by grazing, browsing, or cutting.

dehiscent: breaking open at maturity to release the contents.

deltoid: triangular, with the sides of about equal length.

determinate: of growth or branching, with a bud or flower terminating the growth of the main axis; of an inflorescence. cf. definite.

digitate: branching from the same point like the fingers of a hand.

dioecious: having the male and female reproductive structures on separate plants. cf. monoecious.

diploid: having two of the basic sets of chromosomes in the nucleus. cf. haploid, polyploid, triploid, tetraploid, etc.

diplospory: the formation of a diploid gametophyte from a sporogenous cell of an ovule with meiotic division either omitted or modified so that pairing and reduction of chromosomes do not occur. adj. diplosporous.

discolourous: when two surfaces of a leaf are unlike in colour.

distal: remote from the point of origin or attachment. cf. proximal.

dormancy: the resting or inactive phase of plants or seeds, due to the presence or absence of a growth factor, as of seed when influenced by a need for light or darkness, specific temperature, or after-ripening, or by possession of a coat impermeable to water.

dorsal: of a surface remote from its axis, as the under-surface of a leaf; syn. abaxial. cf. ventral.

drought: a prolonged period without precipitation during which the soil water content is reduced to such an extent that plants suffer from lack of water.

drought tolerance: this rates the ability of a species or strain to survive prolonged periods of dry weather. Ratings assume the species is well adapted to the normal environment, is being utilized each year and is under good management.

DSE: dry sheep equivalent. A measure based on the feed requirement of grazing animals, usually used to assess the capacity of land to carry livestock. The standard unit is represented by the ability to maintain a 45 kg wether at constant body weight from one year to the next. Other animals are rated in relation to this. cf. AU.

duodenum: the first part of the small intestine immediately below the stomach.

E

EC: Electrical Conductivity used to measure soil salinity. It measures the concentration of soluble salts in the soil solution to which plant roots are exposed. EC (L5) is the EC measured in a 1:5 soil to water suspension and expressed in units of decisiemens per metre (dS/m).

eglandular: without glands.

ellipsoid: a solid (3-dimensional) object elliptical in each rotational plane.

elliptic: oval in outline, widest at the centre. ® Illustration.

emarginate: having a broad, shallow notch at the apex.

endotrophic: deriving nutrient from within, e.g. of a mycorrhizal fungus.

epidermis: the outer layer of cells of a plant. adj. epidermal.

erect: vertical or upright.

eutrophication: a natural process in which nutrients from sediments are carried by runoff into surface waters such as lakes and bays, and provide nourishment for algae in the aquatic ecosystem.

evergreen: bearing green leaves throughout the year. cf. deciduous.

F

facultative: occasional; not essential. cf. obligate.

falcate: sickle-shaped. ® Illustration.

fallow: a farming system in which land is left without a crop for a given period to accumulate soil moisture and release nitrogen from organic matter.

fascicle: a bundle or cluster, as in grouping of *Cenchrus* spikelets. adj. fasciculate.

filament: the stalk of a stamen. The stamen comprises the filament and anther.

filiform: thread-like.

floret: a grass flower, together with the lemma and palea that enclose it. One or more florets comprise a grass spikelet.

foggage: decaying grass left after the cutting or grazing season.

foliate: -leaved, as in unifoliate (hence bearing a single leaf).

foliolate: -leafleted, as in trifoliate (hence bearing compound leaves comprising three leaflets).

foliole: a leaflet ; a small part resembling a leaf.

forage: edible parts of plants (other than separated grain) that can provide feed for grazing animals, or that can be harvested for feeding. Increasingly used to refer to the species planted to provide forage.

forb: a non-woody (herbaceous) plant other than a grass, sedge, rush, etc. cf. herb.

frost tolerance: relative ability to withstand the damaging effect of frost.

funicle: of a seed, a supporting attachment (seed stalk).

G

gametes: a reproductive cell (for Angiosperms, pollen and ova).

gametophyte: a plant which produces gametes. cf. sporophyte.

geniculate: bent like a knee.

geocarpic: bearing fruit which develops below the soil surface and remains there until germination, as the peanut of *Arachis hypogaea* . cf. amphicarpic.

gilgai: surface humps and hollows associated with the shrinking and swelling of clay soils. cf. vertisol.

glabrate: almost glabrous.

glabrescent: becoming glabrous.

glabrous: without hairs.

glaucous: becoming bluish-green or glaucous.

glaucous: having a waxy coating (or bloom) producing a white to blue coloring over the plant parts.

globose: nearly spherical.

glomerule: a small compact cluster.

glume: a bract enclosing the flower or spikelet , especially in grasses and sedges.

grass: member of the family Poaceae (Gramineae).

grazing pressure: an animal to forage relationship measured in terms of animal units per unit weight of forage at any instant.

green manure: any crop that is grown to add organic matter, nitrogen or other nutrients to the soil.

ground cover (soil blanketing): a plant, usually with a low-growing spreading habit, grown specifically to cover and protect the soil and control weeds.

growing season: that portion of the year when temperature and moisture favour plant growth.

gynodioecious: having bisexual flowers and female flowers on separate plants. cf. gynomonocious.

gynoecium: the ovule-bearing structure of a flower, made up of one or more carpels.

gynomonoecious: having bisexual and female flowers on the same plant. cf. gynodioecious.

gynophore: a stalk bearing the gynoecium above the level of insertion of the other floral parts. Sometimes applied incorrectly to the 'peg' in *Arachis* spp.

H

habit: the growth form of a plant, comprising its size, shape, texture and orientation.

haploid: having a single set of chromosomes in the nucleus (i.e. having each gene locus represented only once).

cf. diploid, polyploid, triploid, tetraploid , etc.

hardseededness: a physiological condition of seed in which a proportion of viable seeds do not immediately absorb water or oxygen, delaying germination. cf. dormancy.

hay: pasture or crop material that is conserved in a dried state.

haylage: pasture or crop material that is dried to about 50% moisture content and is preserved for feeding to animals. Usually the air has been evacuated forcefully, as in an airtight, glass-lined silo, rather than by compression of the stack. cf. silage.

hedgerows: a closely planted row of shrubs, trees or grass established on the contour through cropland for erosion control. They are often cut to provide feed for livestock, and degradable mulch for improving soil fertility. See "alley cropping".

herb: any vascular plant that does not produce a woody stem. cf. forb.

herbaceous: not woody; soft in texture.

herbivore: an animal that subsists principally or entirely on plants or plant materials.

hermaphrodite: = bisexual.

heterozygous: an organism in which the genes for a specific trait are different. cf. homozygous. (e.g. AaBb).

hilum: the scar on a seed coat (testa) at the place where it was attached to its stalk (funicle) during development.

hirsute: covered with long spreading hairs. cf. villous.

hispid: bearing erect , stiff, bristle-like hairs.

hispidulous: minutely hispid.

homozygous: an organism with identical pairs of genes (or alleles) for a specific trait. cf. heterozygous. (e.g. aaBB).

hyaline: translucent, almost transparent.

hybrid: an offspring of genetically different parents.

hypanthium: a cup-shaped extension of the margin of the receptacle to which sepals, petals and stamens are attached. cf. calyx tube.

hypertrophy: excessive growth or development due to an increase in the size of the cells.

imbricate: overlapping on the edges.

in sacco: = "in bag". Digestibility as measured by suspending a bag containing the feed in the rumen or caecum.

in vitro: literally, "in glass"; a biologic or biochemical process occurring outside a living organism. cf. in vivo .

in vitro digestibility: pertaining to the digestibility of a food in an artificial rumen.

in vivo: literally, "in life"; a biologic or biochemical process occurring within a living organism. cf. in vitro .

indehiscent: not opening at maturity; fruits not opening to release seeds.

indeterminate: of an inflorescence, when the floral axis is not terminated by a flower, i.e. a racemose inflorescence. cf. monopodial.

inflorescence: the group or arrangement in which flowers are borne on a plant.

inoculation: the artificial introduction of micro-organisms (often rhizobia or mycorrhizae) into a habitat to initiate the symbiosis in crop and pasture legumes.

inoculum: a liquid suspension, gel, or peat based material containing live microorganisms (rhizobia, mycorrhizal fungi) that is introduced by inoculation.

intercropping: growing two or more crops together, planted simultaneously or staggered, with or without a row arrangement.

introgression: backcrossing of hybrids of two plant populations to introduce new genes into a wild population.

inundation: flooding. In this context, refers to the periodic covering of the soil with water.

involucre: a group of bracts enveloping a condensed inflorescence, as in a *Cenchrus* fascicle.

irradiation: the exposure to a radiation, e.g. of wavelengths of light.

irrigated pasture: pasture receiving supplementary water to maintain growth.

IVDM: in vitro dry matter digestibility. A laboratory measure estimating the percentage of a feedstuff the animal can digest.

IVOMD: in vitro organic matter digestibility.

J

jugate: of a pinnate leaf when the leaflets are in opposite pairs (jugae). Usually prefixed to indicate the number of opposite pairs, as in uni-, bi-, trijugate.

K

keel: a ridge like the keel of a boat; in Fabaceae, a boat-shaped structure formed by fusion of the two anterior petals of a flower; in Poaceae, the raised midrib of the leaf sheath.

L

lamina: leaf blade; the expanded portion of a leaf.

lanceolate: lance-shaped; of a leaf, 3 or more four times as long as it is broad, broadest in the lower half and tapering towards both ends. © Illustration.

land rehabilitation: the process of returning land to some degree of its former self after it has been damaged by industry, natural disaster, etc.

langley: a measure of solar radiation; equal to one calorie per square centimetre.

lax: loose, not compact.

leaflet: one of the ultimate segments of a compound leaf.

legume: strictly, a fruit (pod) characteristic of the families Mimosaceae, Caesalpiniaceae and Fabaceae, but also used as a common name for a plant species in these families.

lemma: in a grass floret, the lower of the two bracts enclosing a flower.

lenticel: corky spots on young bark corresponding to epidermal stomata.

lenticular: like a doubly convex lens.

ley pasture: a pasture phase as part of a sequence of crops for soil nitrogen and organic matter replenishment, soil structure improvement and disease break.

lignified: woody, due to the deposition of lignin in cell walls.

lignin: a polymer in the secondary cell wall of woody plant cells that helps to strengthen and stiffen the wall, and a major component of certain plant materials, such as wood, hulls, straws, and over-ripe hays. This fraction is essentially indigestible by animals and is the substance that limits the availability of cellulose carbohydrates in the plant cell wall to rumen bacteria.

ligule: a small membranous, ciliate or hairy appendage on the adaxial surface of a leaf, especially in grasses, at the junction between sheath and blade. adj. ligulate.

linear: very narrow in relation to the length, and with the sides parallel. cf. lorate. © Illustration.

living fence: a closely planted row of shrubs, trees or tall grass grown along boundaries, primarily as a barrier but often used as a source of feed for livestock.

loam: a soil texture class with relatively equal amounts of sand and silt and somewhat smaller proportion of clay ; generally a desirable quality. May be subdivided into texture classes like 'sandy loam', 'silt loam' and 'clay loam'.

lomentum: a legume having distinct constrictions or lines of abscission between the seeds and breaking into one-seeded segments when mature, e.g. many *Desmodium* and *Aeschynomenes* spp.

long term pasture: grassland, natural or sown, used as grazing for domestic animals, maintained for a period of 4 or more years.

lorate: of leaves, strap-shaped (moderately long with the two margins parallel). cf. linear.

LSU: live stock unit. (see AU).

LWG: live weight gain.

M

meiosis: the two-stage division of a diploid nucleus to produce haploid gametes or sex cells.

meristem: a group of cells within which active division occurs to form new cells, e.g. apical meristem = growing tips.

metamorphic: of rocks when derived by changes in the properties of pre-existing rocks through forces (e.g. heat and pressure) within the earth's crust.

mitosis: the process of division of cells in which each daughter cell receives the same amount of DNA as the parent cell.

moniliform: cylindrical but constricted at regular intervals like a string of beads.

monoecious: having the male and female structures in separate flowers but on the same plant. cf. dioecious.

monogastric: animals with a single stomach e.g. pigs and poultry. cf. ruminant.

monopodial: of growth, with a persistent terminal growing point producing lateral organs successively. cf. indeterminate.

morphology: the form and structure of an organism or part of an organism; the study of form and structure.

mucilage: slimy material exuded by certain plants or plant organs. adj. mucilaginous.

mucro: a sharp terminal point.

mucronate: terminating abruptly in a sharp point.

mulch: a covering used to maintain soil temperature and moisture and to discourage the growth of weeds. e.g. thick layer of plant material.

mycoplasma: small free-living or parasitic micro-organisms in the order Mycoplasmatales, indeterminate in size between bacteria and viruses.

mycorrhiza: a symbiotic union between a fungus and a plant root; the term is often used in reference to the fungus.

N

NDF: neutral detergent fibre. The insoluble fraction containing all plant cell wall components left after boiling a feed sample in a neutral detergent solution. Contains the fibres in ADF (primarily cellulose and lignin) plus hemicellulose. NDF is used to predict ruminant feed intake.

nectary: a gland which secretes a sweet fluid (nectar).

neuter: sterile.

neutral soil: neither acid or alkaline; commonly pH 6.6-7.3. cf. acid, alkaline.

nitisol: defined by a significant accumulation of clay (30% or more by mass and extending as much as 150 cm below the surface) and by a blocky aggregate structure. Iron oxides and high water content are believed to play important roles in creating the soil structure. Also nitosol.

node: the portion of a stem from which a leaf or bract arises.

nodulate: the process of forming nodules, usually in reference to the symbiosis in legume roots.

nodule: of a root, a swelling caused by excessive development of tissue, e.g. the nodule of a legume when invaded by a nitrogen-fixing bacterium. Legume nodules assume various shapes specific to the host plant, e.g. aeschynomoid, desmodioid.

nomen illegitimum: a name which, at the time of its publication, was superfluous (because it included the type of an earlier name which should have been adopted) or had already been applied to another plant; abbrev. nom. illeg.

nomen nudum: a name published without a diagnosis or description of the entity to which it was applied, and without reference to either.

nyctinasty: the tendency of leaves or other parts of a plant to take up different positions at different times, usually in response to regular (esp. nightly) changes in light intensity or temperature. adj. nyctinastic.

O

oblanceolate: similar in shape to lanceolate but attached at the narrower end. © Illustration

oblate: transversely broadly elliptic.

obligate: restricted to a particular way of life. cf. facultative.

oblong: longer than broad and with parallel sides, rounded at both ends. © Illustration.

obovate: similar in shape to ovate but attached at the narrower end. © Illustration.

obovoid: a solid that is obovate in outline.

obtuse: strictly $>90^\circ$; of leaves, blunt or rounded at the end.

orbicular: circular or nearly so. © Illustration.

osmosis: the diffusion of liquid through a semipermeable membrane (such as a cell wall) until there is an equal concentration on both sides of the membrane. adj. osmotic.

outcross: a cross between relatively unrelated individuals.

ovary: that part of a pistil which contains the ovules and eventually becomes the fruit.

ovate: egg-shaped, and attached by the wider end. © Illustration.

ovoid: egg-shaped (applied to a solid body).

oxisol: deep, red, highly weathered soils of the tropics without clearly marked horizons.

P

palatability: the relish with which a particular species or plant part is consumed by an animal.

palea: in a grass floret, the upper one of the two bracts enclosing a flower.

palmate: divided into segments like the fingers of a hand; of a leaf, divided into several leaflets which arise at the same point.

panicle: a compound raceme; an indeterminate inflorescence in which the flowers are borne on branches of the main axis or on further branches of these.

papyraceous: of a paper-like texture.

PAR: Photosynthetically Active Radiation. An estimate of the amount of visible light available for photosynthesis.

paraheliotropic: minimization of water loss by reducing the amount of radiation absorbed by the leaves; the leaves orient themselves parallel to the sun's rays.

parenchyma: tissue forming the ground (fundamental) structure of a plant, the cells are actively functioning, usually thin-walled and polyhedral in shape.

pasture: grassland, natural or sown, used as grazing for domestic animals.

pedicel: the stalk of a flower. adj. pedicellate.

peduncle: the stalk of an inflorescence. adj. pedunculate.

perennial: a plant whose life cycle extends over more than two growing seasons. cf. annual , biennial.

petal: the unit of a corolla.

petiole: the stalk of a leaf.

petiolule: the stalk of a leaflet.

pH: a numerical measure of the acidity of a soil. The neutral point is pH 7.0. All pH values below 7.0 are acid and all above are alkaline.

phase pasture: a pasture phase, often incorporating legumes, in a rotational system of cropping. cf. ley pasture.

phellum: outer layer of non-living suberized (corky) cells of bark.

phloem: vascular tissue of plants that conducts synthesised foods e.g. sugars, proteins, through the plant.

photoperiod: the relative lengths of alternating periods of darkness and light affecting the growth and maturity of an organism, as flowering.

photosensitization: the photochemical process induced by a photosensitizer.

photosensitizer: an agent occurring in plants which has an effect on unpigmented skins of animals when eaten by them, causing the skin to have an irritated or inflamed reaction when exposed to sunlight.

phototropism: the effect of light on the direction of growth.

phytoplasma: formerly referred to as a Mycoplasma -like organism (MLO) which affects plants, causing disease such as yellows in Pennisetum clandestinum , and witches broom in Medicago sativa .

phytotoxic: toxic (damaging) to at least some plants.

pilose: covered with long, slender soft hairs.

pinna: one of a number of first order leaflets of a pinnately compound leaf. pl. pinnae.

pinnate: of a compound leaf, in which the leaflets (pinnae) are arranged in two rows, one on each side of a midrib or rachis. cf. bipinnate, tripinnate.

pinnule: the ultimate segment of a divided pinna.

pistil: = gynoecium

PLS: Pure Live Seed. % PLS = % purity x % germination.

pod: a general term for a dry, dehiscent or indehiscent fruit, usually in reference to a legume.

podzolic: soil usually forming in a broadleaf forest and characterised by moderate leaching, which produces an accumulation of clay and, to some degree iron, that has been transported from another area by water. The humus formed produces a textural layer that is less than 50 cm from the surface.

pollination: transfer of pollen from the anther to the stigma.

polymorphic: with many different forms.

polyploid: having more than two of the basic sets of chromosomes in the nucleus. cf. haploid, diploid, triploid, tetraploid , etc.

ponded pasture/wetlands: a natural or modified system of pondage, in which suitably adapted forages are grown in water, primarily for dry season fodder production.

ppm: parts per million. = mg/kg.

praemorse: appearing bitten off at the end.

primordial: original or first-formed.

procumbent: trailing or spreading along the ground but not rooting at the nodes.

production potential: estimated maximum yield, which can be sustained when grown in an environment to which it is well adapted.

promiscuous: in reference to legume nodulation; ability of the plant to nodulate freely with a number of different strains of rhizobium.

prostrate: lying flat on the ground.

provenance: the original geographic source of a plant or its propagules.

proximal: near to the point of origin or attachment. cf. distal.

pseudo-: a prefix meaning false, indicating close or deceptive resemblance to the following element of the word, e.g. pseudo-spike, pseudo-umbel.

pseudogamy: requirement for pollination prior to embryo development in apomixis.

psyllid: small sucking insects (Order Homoptera, Family Psyllidae) often causing significant damage to legumes, e.g. *Heteropsylla cubana* on *Leucaena leucocephala* and *Acizzia* sp. on *Desmanthus* spp.

puberulent (puberulous): covered with minute, soft hairs.

pubescent: covered with short, weak, soft hairs.

punctate: dotted or shallowly pitted, often with glands.

pyriform: pear-shaped.

R

raceme: an indeterminate inflorescence in which a main axis produces a series of flowers on lateral stalks, the oldest at the base and the youngest at the top. adj. racemose. cf. cyme.

rachilla (= rhachilla): a secondary axis of an inflorescence or compound leaf; of a grass spikelet , the axis above the glumes.

rachis (= rhachis): the axis of an inflorescence or a pinnate leaf; pl. rachises. Secondary rachis (rhachilla): the axis of a pinna in a bipinnate leaf, or of a branch in a branched inflorescence.

rainfall: the average annual rainfall (mm) in your environment.

receptacle: the slightly swollen or cup-shaped structure at the tip of the flower stalk (pedicel/peduncle) to which the floral parts are attached (= torus< /A>).

reniform: kidney-shaped.

reticulate: forming a network.

retorse: directed back or downwards.

rhizobium: a generic term for bacteria that live symbiotically in nodules on the roots of legumes and fix nitrogen that is used by the host plants (incl. *Bradyrhizobium*, *Rhizobium*, *Methylobacterium*).

rhizomatous: developing rhizomes.

rhizome: a root-like stem lying prostrate on or under the ground and developing adventitious roots and scale-leaves; buds formed in scale-leaf axils may form either rhizome branches or upright shoots. cf. stolon.

rhizosphere: the part of a soil immediately associated with a root-system.

rhomboid: quadrangular, with the lateral angles obtuse. ® Illustration.

rotund: rounded, almost orbicular.

rumen: the large, first compartment of the stomach of a ruminant from which ingested food is regurgitated for rechewing (rumination) and in which digestion is aided by symbiotic microbial action.

ruminant: cud-chewing mammals such as cattle, sheep, goats, and deer that have a stomach divided into four compartments (rumen, reticulum, omasum, abomasum). cf. monogastric.

runner: see stolon.

S

saline soil: soil containing high amounts of soluble salts.

sand: soil particle coarser than silt but finer than gravel, gritty to the feel.

savannah: a community, dominated by perennial xeromorphic grasses with a scattering of shrubs and trees, in regions with summer rainfall and a definite dry season.

scaberulous: slightly rough to the touch, minutely scabrous.

scabrid: see scabrous.

scabrous (= scabrid): rough to the touch.

scandent: climbing.

scarification: of seed, the breaking of dormancy by removal of the barrier inhibiting absorption of water (e.g. by abrasion, heat treatment, sulphuric acid). See hardseededness.

scarious: thin and dry, not green.

scleromorph: a plant whose leaves (or stems, if leafless) are hard in texture, usually having thick cuticle and containing many fibres. cf. xeromorph.

scrambler: a climbing or semi-climbing plant without special means of securing a hold to a support.

self fertilization: the union of gametes contributed by the one individual.

selfing: self fertilization. cf. autogamous.

sepal: a segment of the calyx.

septum: a cross-wall or partition.

serrate: of a leaf margin, notched on the edge with asymmetrical teeth which point forward.

serrulate: minutely serrate.

sessile: without a stalk.

setaceous: = setose.

setose: covered with bristles.

short term pasture: a pasture phase as part of a sequence of crops for nitrogen replenishment and disease break.

short-lived perennial: a perennial plant where the individuals live for only two or three years.

shrub: a woody plant, usually less than 3 m high, with many stems from the base.

silage: conserved fodder, harvested while green, and preserved by the formation of organic acids (mainly lactic) in anaerobic fermentation. cf. haylage.

silt: soil particle finer than sand, but not as fine as clay, silky to the feel.

sodicity: a measure of exchangeable sodium in relation to other exchangeable cations. Plant species vary in their tolerance of sodicity.

soil Al/Mn toxicity: levels of available soil aluminium and manganese increase with decreasing pH below pH 5.5. Plants vary in their tolerance of these elements.

soil drainage: the capacity for water to pass through the soil profile.

soil fertility: the ability of a soil to hold and release nutrients for plant growth. In the "Selection Tool", the ratings refer to fertility conditions of the soil as applied in the system, not the natural fertility. "High fertility" relates to those soils that can sustain good plant growth of fertility-demanding species with the addition of little or no Fertilizer. By contrast, "low fertility" relates to those soils requiring significant Fertilizer inputs to achieve productive growth in fertility-demanding species.

soil pH: an indication of the acidity or alkalinity of the soil. See pH.

soil reaction: = soil pH.

soil salinisation: process by which salts such as sodium chloride accumulate in a soil profile.

soil salinity: a measure of the total amount of soluble salt in soil, usually measured in terms of conductivity of an extracted solution and expressed in terms of decisiemens per metre (dS/m). See also saline soil, E.C.

soil texture: a measure of the relative proportions of sand, silt and clay in the soil. © Soil classification triangle.

solitary: of flowers, borne singly, not grouped in an inflorescence.

solonetz: soils with subsurface clay accumulation, rich in sodium.

spike: a simple racemose inflorescence with sessile flowers or spikelets. cf. cyme and raceme.

spikelet: a unit of the inflorescence in grasses, consisting of one to many flowers (florets) and associated glumes.

sporogenous: spore-producing.

sporophyte: diploid or polyploid plants responsible for the production of spores, and thus the generation of new gametophytes. cf. gametophyte.

stamen: one of the male organs of a flower, consisting typically of a stalk (filament) and a pollen bearing portion (anther). adj. staminate.

standard: the large upper petal of a flower of Fabaceae and Caesalpiniaceae. (= vexillum).

standover forage: bulked forage produced during the growing season and maintained in the paddock to provide feed during the dormant season. Also stockpiled forage, standing hay or foggage.

stem: the main axis or a branch of the main axial system of a plant, typically bearing leaves.

stigma: the pollen-receptive surface of the pistil of a flower, normally on the tip of the style or ovary.

stipe: a supporting structure or stalk.

stipel: secondary stipule at the base of a leaflet.

stipitate: stalked; borne on a stipe.

stipule: small leaflike appendage at the base of a leaf petiole, often occurring in pairs.

stipuliform: having the form or appearance of a stipe; stalk-like.

stolon: = runner; a slender prostrate stem, growing above the ground, and rooting at intervals, usually at the nodes.

stoloniferous: having stolons; trailing over the soil surface and rooting at the nodes.

stoma: of a leaf; a pore in the epidermis or other aerial organ, providing for gaseous exchange between the tissues and the atmosphere. pl. stomata.

stover: the dried stalks and leaves of a field crop (especially maize) after the grain has been harvested, which can be used as animal fodder.

striate: marked with long narrow ridges or depressions.

strigose: with short, stiff hairs lying close to the surface.

style: the stalk of a gynoecium connecting the stigma to the ovary.

sub-shrub: a low growing plant having a woody base and herbaceous canopy.

subtend: to stand below or close under, as a bract subtending a flower.

subulate: narrow and tapering gradually to a fine point. ® Illustration.

suture: of pods, a line of junction or dehiscence between fused carpels.

sward: a community of pasture plants.

symbiosis: a relationship between two organisms of different species living together in close association for their mutual benefit.

T

tannin: naturally occurring, astringent tasting plant polyphenols that bind and precipitate proteins. They are found in many legumes and can have a large influence on their nutritive value.

taproot: the main, descending root of a plant that has a single, dominant root axis.

taxon: a group or category, at any level, in a system for classifying plants or animals. pl. taxa.

TDN: Total Digestible Nutrients, the percentage of digestible material in a forage.

temperature: the degree of hotness or coldness as measured on some definite temperature scale.

terete: cylindrical, circular in cross-section, sometimes in the sense of tapering.

terminal: at the apex or distal end.

testa: the outer coat of a seed.

tetrafoliate: of a leaf, having four leaflets.

tetraploid: having four of the basic sets of chromosomes in the nucleus. cf. diploid, haploid, polyploid, triploid, etc.

thigmotaxis: a response, by movement or growth, to a mechanical stimulus, e.g. leaves of Mimosa spp. closing when touched. adj. thigmotactic.

tomentose: densely covered with short matted hairs.

torus: see receptacle.

tree: a woody plant, at least 3 metres high, usually with an evident trunk.

trichome: an epidermal outgrowth, e.g. a hair (branched or unbranched), a papilla.

trifoliate: having three leaves. Sometimes used incorrectly in place of "trifoliolate".

trifoliolate: of a leaf, having three leaflets.

tripinnate: of compound leaves, having primary, secondary and tertiary rachises. cf. bipinnate, pinnate.

triploid: having three of the basic sets of chromosomes in the nucleus. cf. diploid, haploid, polyploid, tetraploid, etc.

truncate: terminating more or less squarely at the end, as though cut off.

tubercle: a small swelling or rounded protuberance, sometimes found at the base of a hair.

tuberculate: bearing tubercles.

tussock: a tuft, or small hillock of growing grass.

twining (twiner): climbing by winding the stem around the support.

U

ultisol: extensively weathered, strongly acid soils of tropical and subtropical climates; often with high levels of exchangeable aluminium.

umbel: a racemose inflorescence in which all the individual flower stalks arise in a cluster at the top of the peduncle and are of about equal length.

uncinate: terminating in a hooked point.

ungulate: a hoofed animal.

V

velutinous: with a velvet-like covering of short and fine erect hairs.

ventral: of a lateral organ, facing towards the subtending axis; e.g. the uppermost surface of a leaf. syn. adaxial. cf. dorsal.

vertisol: black or brown clay soils (30% or more clay), developing deep wide cracks when dry, commonly with a gilgai micro relief. cf. gilgai, e.g. black cotton soils.

vestigial: reduced from the ancestral condition and no longer functional.

vexillum: = standard (of a flower).

viability: a measure of the potential for seeds to germinate and grow.

viable: of seed, capable of germination.

villous: covered with long, soft, weak hairs. cf. hirsute.

viscid: sticky.

vleis: colloquial South African term for wetland.

volute: describes a stem that climbs by winding or twining round another body.

W

waterlogging: saturated state of a soil profile due to poor drainage.

whorl: a ring of leaves, bracts or floral parts borne at the same level on an axis.

X

xeriscape: a landscape designed with drought-tolerant plants, to eliminate the need for supplemental watering.

xeromorph: a plant having structural features usually associated with plants of arid habitats (such as hard or succulent leaves) but not necessarily drought-tolerant. cf. scleromorph, xerophyte.

xerophyte: a drought-tolerant plant. cf. xeromorph.

xylem: vascular tissue that conducts water and mineral salts throughout the plant and provides it with mechanical support.

xylopodium: a more or less massive underground storage structure formed from stems and/or roots allowing resprouting after fire (= lignotuber).

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