H

H layer (H-laag)
A layer occurring in mor humus consisting of well-decomposed organic matter of unrecognizable origin. The O2 horizon. See soil horizon.

habitat (habitat)
The environment in which the life requirements of a plant or animal organism, population, or community are supplied.

haematite (hematiet)
See hematite.

haematomelanic acid (hematomelaniensuur)
See hymatomelanic acid.

Half-bog Soil (Moerassige Grond)
A great soil group, of the intrazonal order and hydromorphic suborder consisting of soil with dark-brown or black peaty material over greyish and rust-mottled mineral soil; formed under conditions of poor drainage under forest, sedge, or grass vegetation in cool to tropical humid climates.

halite (haliet)
NaCl, cubic.

halloysite (halloysiet)
A 1:1 aluminosilicate mineral similar in structure to kaolinite. Due to variations in hydration, halloysite has a variable interlayer spacing: 0,74 nm up to 1,0 nm compared with 0,72 nm for kaolinite. Electron micrographs of well crystallized kaolinite show six-sided flakes, whereas halloysite typically shows tubular crystal shapes.

halomorphic soil (halomorfe grond)
Soils the properties of which are determined wholly or in part by the presence of neutral or alkali salts, or both.

halophyte (halofiet)
A plant that grows naturally in saline soils.

hard (consistence) (hard (konsistensie))
See soil consistence.

hardness scale (hardheidskaal)
A standard of ten minerals by which the hardness of a mineral may be rated, viz. 1. Talc, 2. Gypsum, 3. Calcite, 4.Fluorite, 5. Apatite, 6. Orthoclase, 7. Quartz, 8. Topaz, 9. Corundum, 10. Diamond. Syn. Mohs' scale of hardness.

hardpan (hardebank)
A massive material enriched with and strongly cemented by sesquioxides, chiefly iron oxides (also known as ferricrete, diagnostic hard plinthite, ironpan, ngubane, ouklip,

laterite hardpan), silica (silcrete, dorbank) or lime (diagnostic hardpan carbonate horizon, calcrete). Ortstein hardpans are cemented by iron oxides and organic matter. Cf. dorbank; nodule; induration; diagnostic horizon: hardpan carbonate horizon; hard plinthic B horizon.

hardpan carbonate horizon (hardebank karbonaathorison)
See diagnostic horizon.

hard plinthic B horizon (harde plintiese B-horison)
See diagnostic horizon.

hard plinthite (harde plintiet)
See hardpan.

hard rock (harde rots)
See diagnostic horizon.

head, hydraulic (hoogte, hidrouliese)
See soil water : hydraulic head.

headwater (hoofwater)
(1) The source of a stream.
(2) The water upstream from a structure or point in a stream.

heat budget (hittebalans)
The accounting of the total amount of heat received and lost by a particular system, such as a lake, a glacier, or the entire earth during a specific period. Syn. heat balance.

heat capacity (hittekapasiteit)
The amount of heat required to raise the temperature of a unit volume, or mass, of soil by one degree. The units of volumetric heat capacity and of heat capacity on a mass basis, are J m^{-3} °C^{-1} and J kg^{-1} °C^{-1}, respectively.

heat flux density (hittevloeddigtheid)
See thermal flux.

heat of wetting (benattingswarmte)
The adsorption of water upon clay surfaces is an exothermic process, resulting in the liberation of an amount of heat known as the heat of wetting. It results from a lowering of the free energy of water.

heave (opswel; rys)
See swelling clay.

heaving soil (swelgrond)
See swelling soil.

heavy metal (swaarmetaal)
(1) Any of the transition elements, e.g. manganese, iron, cobalt, nickel, copper, zinc, silver, cadmium, tin, tantalum, platinum, gold, mercury, tellurium, lead, bismuth, etc.
(2) Those metals with densities, of the pure metal, greater than 5 000 kg/m^3.

heavy mineral (swaarmineraal)

A detrital mineral from a sedimentary rock, having a density higher than a standard (usually 2 850 kg/m^3), and commonly occurring as a minor constituent or accessory mineral of the rock (less than 1% in most sands); e.g. magnetite, ilmenite, zircon, rutile, kyanite, garnet, tourmaline, sphene, apatite, biotite.

heavy soil (obsolete) (swaar grond (verouderd))

A soil with a high content of the fine separates, particularly clay, or one with a high drawbar pull and hence difficult to cultivate. Cf. fine texture.

hectorite (hektoriet)

See smectite.

hematite (hematiet)

A common iron mineral : α-Fe_2O_3. It is dimorphous with maghemite and is the principal red pigment in soils, occurring as coatings on soil mineral particles in iron-rich soils under oxidizing conditions. Hematite occurs in splendent, metallic-looking, steel-grey or iron-black rhombohedral crystals, in reniform masses or fibrous aggregates, or in deep-red or red-brown earthy forms, and it has a distinctive cherry-red to reddish-brown streak and a characteristic brick colour when powdered. It is found in igneous, sedimentary, and metamorphic rocks both as a primary constituent and as an alteration product. Syn. haematite; red hematite; red iron ore; red ochre; rhombohedral iron ore; bloodstone.

heterotroph (heterotroof)

An organism capable of deriving carbon and energy for growth and cell synthesis by the utilization of reduced organic compounds. Cf. autotroph.

hill (heuwel)

An area where local relief is between 60 m and 600 m, and where slopes of more than 5% predominate.

histic epipedon (histiese epipedon)

See diagnostic horizon.

histic H horizon (obsolete) (histiese H-horison (verouderd))

See diagnostic horizon.

histic horizon (histiese horison)

See diagnostic horizon.

Histosol (obsolete) (Histosol (verouderd))

See soil classification.

hogsback (skerprug)

A ridge formed by the outcropping edge of tilted strata, hence any ridge with a sharp summit and steeply sloping sides, as an esker.

hollow-tining (holtandbewerking)

A method of turf cultivation in which smallish soil cores are removed by a suitable coring implement, the purpose being to aerate the soil and to increase its porosity. Cf. tining.

Holocene (Holoseen)
See geological time scale.

horizon, soil (grondhorison)
See soil horizon.

hornblende (hoornblende)
The commonest mineral of the amphibole group : $Ca_2Na(Mg,Fe^{2+})_4(Al,Fe^{3+},Ti)_3Si_6O_{22}(O,OH)_2$. It has a variable composition, and may contain potassium and appreciable fluorine. Hornblende is commonly black, dark green, or brown, and occurs in distinct monoclinic crystals or in columnar, fibrous, or granular forms. It is a primary constituent in many acid and intermediate igneous rocks (granite, syenite, diorite, andesite) and less commonly in basic igneous rocks, and it is a common metamorphic mineral in gneiss and schist.

hornfels (hoornfels)
A fine-grained, non-schistose metamorphic rock resulting from contact metamorphism of argillaceous rocks. Large crystals, either porphyroblasts or relic phenocrysts, may be present.

hue (skakering)
See soil colour.

humic acid (humussuur)
A mixture of dark-coloured substances of indefinite composition extracted from soil with dilute alkali and precipitated by acidification to pH 1 to 2.

Humic Gley Soil (obsolete) (Humiese Gleygrond (verouderd))
Soil of the intrazonal order and hydromorphic suborder that includes Wiesenboden and related soils, such as Half-Bog Soils, which have a thin muck or peat O2 horizon and an A1 horizon. Developed in wet meadows and in forested swamps.

humic A horizon (humiese A-horison)
See diagnostic horizon.

humidity (humiditeit)
(1) Absolute humidity. The density of water vapour, generally expressed in grams per cubic metre.
(2) Relative humidity. The ratio of the actual amount of water vapour present in the portion of the atmosphere under consideration to the quantity that would be there if it were saturated.

humification (humifikasie)
The process whereby the carbon of organic residues is transformed and converted to humic substances through biochemical and/or chemical processes.

humin (humien)

The fraction of the soil organic matter that is not dissolved upon extraction of the soil with dilute alkali.

humus (humus)
(1) That more or less stable fraction of the soil organic matter, remaining after the major portion of added plant and animal residues has decomposed; usually amorphous and dark coloured.
(2) Includes the F and H layers in undisturbed forest soils. See soil organic matter; soil horizon: 01 and 02.

humus-clay complex (klei-humus kompleks)
See clay-humus complex.

humus layer (humuslaag)
The top portion of the soil which owes its characteristic features to the humus contained in it.

hydrargic horizon sequence (hidrargiese horison-opeenvolging)
See diagnostic horizon.

hydrate (hidraat)
See hydration.

hydration (hidrasie)
The chemical process by which water combines with a substance to form a hydrated compound. Hydration is important in the weathering of rocks and minerals as it changes the solubility of minerals. It is also a means by which colour changes occur in soils; the reddish to yellowish colours in many rocks and soils are due to the hydration of iron minerals.

hydraulic conductivity (hidrouliese geleivermoë)
See soil water : hydraulic conductivity.

hydraulic gradient (hidrouliese gradiënt)
See soil water : hydraulic gradient.

hydraulic head (hidrouliese hoogte)
See soil water : hydraulic head.

hydraulic potential (hidrouliese potensiaal)
See soil water : hydraulic potential.

hydraulic pressure (hidrouliese druk)
See soil water : hydraulic potential.

hydraulic radius (hidrouliese straal)
A characteristic length parameter linked with the hypothetical channels to which the porous medium is presumed to be equivalent. Measured as the ratio of the volume to the surface of the pore space, or the average ratio of cross-sectional area to the corresponding perimeter.

hydrobiotite (hidrobiotiet)

(1) A light-green, trioctahedral, mixed layer clay mineral composed of inter-stratification of biotite and vermiculite.
(2) A term applied originally to a biotite-like material high in water content.

hydrodynamic dispersion (hidrodinamiese dispersie)
A spreading phenomenon observed in porous media resulting from unequal liquid flow velocities in pores of different sizes, and with distance from the wall within pores. The dispersion phenomenon is observed as a s-shaped concentration versus time break-through curve following the introduction of a tracer to the inflow face of a liquid-conducting column.

hydrogel (hidrojel)
A gel with water as the liquid component (as opposed to organogels).

hydrogen bond (waterstofbinding)
The localized electrostatic attraction between a somewhat acidic hydrogen atom carrying a partial positive charge (as in the bonds O-H, F-H, N-H, etc.) and an electron-rich basic type atom (such as the oxygen in water, alcohols or ethers and the nitrogen in amines). The hydrogen bond is too long (in the order of 0,17 nm) for covalent character to be expected and is due to the charge arrangement in the two molecules concerned.

hydrogenic soil (hidrogeniese grond)
Soil developed under the influence of water standing within the profile for considerable periods; formed mainly in cold, humic regions.

hydrograph (hidrograaf)
A graph showing, for a given point on a stream or conduit, the discharge, velocity, available power, or other property of water with respect to time.

hydrologic cycle (hidrologiese siklus)
The course taken by water in moving from the oceans to the land via evaporation and precipitation and returning via stream flow. The subsystem of the global energy system that regulates the flow of energy through the heat-exchange property of water.

hydrology (hidrologie)
The study of the occurrence, distribution and movement of water over, on and under the land-surface.

hydrolysis (hidrolise)
(1) A chemical reaction between water and a salt with the resulting formation of a hydroxide and a weak acid.
(2) A process of chemical weathering, a reaction involving water, strictly one in which a salt combines with water to form an acid and a base. E.g. the breakdown of feldspar, whereby colloidal silica is removed in solution and clays are formed.

hydromica (hidromika)
A hydrous dioctahedral aluminium silicate clay mineral with a 2:1 lattice structure and containing a considerable amount of potassium that serves as an additional bonding between the crystal units, resulting in particles larger than normal in smectites. It has a

smaller cation exchange capacity than montmorillonite. Sometimes referred to as illite or mica. Cf. smectite; illite.

hydromorphic (hidromorf)
See Hydromorphic soil; hydromorphy.

Hydromorphic Soil (Hidromorfe Grond)
A suborder of intrazonal soils, consisting of seven great soil groups, all formed under conditions of poor drainage in marshes, swamps, seepage areas, or flats. Cf. soil classification.

hydromorphy (hidromorfie)
A process of gleying and mottling resulting from the intermittent or permanent presence of excess water. Hydromorphic soils display evidence of this process.

hydromulching (deklaagspuiting)
The technique of spraying slurry of fibre, seed, fertilizer, and chemicals onto roadsides for erosion control.

hydromuscovite (hidromuskoviet)
A term applied loosely to any fine-grained, muscovite-like clay mineral commonly but not always high in water content and deficient in potassium. It is probably an illite.

hydrophilic (hidrofiel)
Describes a substance, such as a colloid, that has an affinity for water.

hydrophobic (hidrofoob)
Describes a substance, for example a fat, that repels water.

hydrophyte (hidrofiet)
A plant that thrives on an abundance of water.

hydroponics (hidroponika)
The technology whereby plants are grown without soil, i.e. by supplying nutrients by means of nutrient solutions, for the commercial production of food or ornamental plants.

hydrostatic pressure (hidrostatiese druk)
See soil water : hydrostatic pressure.

hydrostatic pressure head (hidrostatiese drukhoogte)
See soil water : hydrostatic pressure head.

hydrostatic pressure potential (hidrostatiese drukpotensiaal)
See soil water : hydrostatic pressure potential.

hydrous oxides (hidro-oksiede)
Partially hydroxylated oxides of Fe, Al, Mn and Ti, e.g. FeO(OH), AlO(OH) and MnO(OH). Together with amorphous aluminosilicates they are the most important clay-size minerals in soils. Syn. hydroxyoxide.

hydroxyapatite (hidroksie-apatiet)

(1) **A mineral of the apatite group : $[Ca_3(PO_4)_2]_3.Ca(OH)_2$.**

(2) **Also an apatite mineral in which hydroxyl predominates over fluorine and chlorine. Syn. hydroxylapatite. Cf. apatite.**

hygrometer (higrometer)

Any instrument for measuring the humidity of air. The commonest is the wet and dry bulb thermometer or psychrometer. Cf. psychrometer.

hygroscopic (higroskopies)

Refers to a substance exhibiting the property of water uptake from the atmosphere.

hygroscopic water (higroskopiese water)

Water adsorbed by a dry soil from an atmosphere of high relative humidity, or water remaining in the soil after "air drying", or water held by the soil when it is in equilibrium with an atmosphere of a specified relative humidity at a specified temperature, usually 98% relative humidity at 25°C.

hymatomelanic acid (hematomelaniensuur)

The alcohol-soluble portion of the humic acid fraction of soil organic matter.

hypabyssal (hipabissaal)

Igneous rocks (e.g. dolerite) that have risen from the depths as magma but solidified mainly as intrusions such as dykes and sills before reaching the surface.

hypercalcic horizon (hiperkalsiese horison)

See diagnostic horizon.

hypergypsic horizon (hipergipsiese horison)

See diagnostic horizon.

hypersthene (hipersteen)

See pyroxene group of minerals.

hyperthermic (hipertermies)

See soil temperature.

hypha (hife)

The mycelium of a fungus which is a branching, filamentous structure with apical growth; the tubular cytoplasm contains the nucleii and may be divided by septa. Pl. hyphae. Cf. mycelium.

hysteresis (histerese)

See soil water : hysteresis.

hysteresis loop (histereselus)

See soil water : hysteresis; scanning curve.

I

igneous rock (stollingsgesteente)

Rock formed from the cooling and solidification of magma, and that has not been changed appreciably since its formation. Cf. basic rock; acid rock; extrusive rock; intrusive rock.

illite (illiet)

(1) A general name either for non-expandible mica of detrital or authigenic origin or for the micaceous component of interstratified systems as in illite-smectite.

(2) The species illite (a constituent of argillaceous sediments) is a diagenetic dioctahedral mica of composition similar to muscovite. It differs from muscovite primarily in having poorer crystallinity, a lower K content and higher water content.

illuvial horizon (illuviale horison)

See illuviation.

illuviation (illuviasie)

The process of deposition of soil material (soluble and/or suspended) removed by percolating water from one horizon to another in the soil; usually from an upper to a lower horizon in the soil profile. Cf. eluviation.

ilmenite (ilmeniet)

A black mineral found in igneous rocks as sedimentary deposits and in veins. It is the chief source of titanium. Composition : iron titanium oxide ($FeTiO_3$).

imbalance (nutrients) (wanbalans (voedingstowwe))

A ratio between any two or a number of plant nutrients or other elements in soils or plants, resulting in one or more nutrient deficiencies in plants and hence restricted plant growth or yield.

immature soil (onvolwasse grond)

A soil with indistinct or only slightly developed horizons because of the relatively short time it has been subjected to the various soilforming processes. It is a soil that has not reached equilibrium with its environment. Also termed juvenile or young soil.

immobilization (immobilisasie)

The conversion of an element from the inorganic to the organic form in microbial or in plant tissues.

imogolite (imogoliet)

A naturally occurring gel-like hydrous aluminium silicate which has been shown by electronmicroscopy to consist of bundles of fine tubes, each about 2 nm in diameter. It has an approximate composition of $1{,}5SiO_2.Al_2O_3.2{,}5H_2O$. The genesis and properties of imogolite are closely related to those of allophane.

impeded drainage (belemmerde dreinering)

A condition which hinders the movement of water through soils under the influence of gravity.

impermeable (ondeurlatend)

The condition of a soil or other porous medium when the transmission of a fluid under a hydraulic gradient is zero or extremely slow.

impervious (ondeurdringbaar)
Refers to a material that is resistant to penetration by fluids or by roots.

Inceptisol (Inseptisol)
See soil classification.

incise (insny)
Cut down into, as a river cuts into a plateau.

indicator plant (indikatorplant)
Any plant that, by its presence, its frequency, or its vigour indicates any particular property of the site and particularly, but not exclusively, of the soil.

induration (verharding)
A brittle, hard consistence caused by cementing substances other than quartz and crystalline alumino-silicates. Common cementing agents are sesquioxides, lime and silica. Typically cementation is not altered by wetting. It may be continuous or discontinuous in a horizon. Cf. hardpan.

infiltrability (infiltreerbaarheid)
See soil water : infiltrability.

infiltration (infiltrasie)
See soil water : infiltration.

infiltration rate (infiltrasietempo)
See soil water : infiltration rate.

infiltrometer (infiltrasiemeter)
A device for measuring the rate of entry of fluid into a porous body, e.g. water into soil.

inner-sphere complex (binnesfeerkompleks)
A complex in which the ligands and central group are in direct contact. Cf. complex; outer-sphere complex.

inoculation (enting; inenting)
As an example, it is the process of introducing nitrogen-fixing bacteria or mycorrhizal fungi into soil or onto seed to enhance plant growth.

inorganic fertilizer (anorganiese misstof)
As opposed to organic fertilizer, it is a fertilizer consisting of inorganic substances. (Note: Urea is also regarded as an inorganic fertilizer.)

inosilicate (inosilikaat)
A class or structural type of silicate characterized by the linkage of the SiO_4 tetrahedra into linear chains by the sharing of oxygens. In a simple chain, e.g. pyroxenes, two oxygens are shared; in a double chain or band, e.g. amphiboles, half the SiO_4

tetrahedra share three oxygens and the other half share two. The Si:O ratio of the former type is 1:3 and for the latter it is 4:11. Syn. chain silicate.

insolation (insolasie)
The rate at which radiant energy is incident directly from the sun per unit of horizontal area at any place on or above the surface of the earth. Its value depends upon : the solar constant; the distance of the point from the sun; the inclination of the sun's rays to the horizontal plane at the point under consideration and the transparency of the atmosphere.

interaction (interaksie)
(1) Mutual or reciprocal action or influence between organisms, between organisms and environment, or between environmental factors.
(2) Stimulating or inhibiting effects of plant nutrients on one another.

interception loss (onderskepverlies)
That portion of precipitation caught by the foliage, twigs and branches of trees, shrubs and other vegetation, lost therefrom by evaporation, and so prevented from reaching the surface of the soil.

interceptor drain (onderskepdrein)
A surface or subsurface drain or a combination of both, designed and installed to intercept flowing water.

intercropping (menggewasverbouing)
Growing two or more different crops at the same time on a plot. For example, a grain that depletes soil nitrogen and a legume that adds nitrogen to the soil may be intercropped. Cf. stripcropping.

interface (tussenvlak)
The boundary layer separating two phases or substances.

interfluve (tussenriviergebied)
The area between two adjacent streams flowing in the same general direction.

intergrade (tussengraad)
A soil which cannot be accommodated in a single class and which has some of the diagnostic features of two or more genetically related classes.

intergranular pressure (tussenkorreldruk)
See effective stress.

interlayering (tussengelaagdheid)
The regular or random arrangement of structural units of clay minerals in a clay, each unit differing from the adjacent unit either in composition or in crystallographic orientation.

internal drainage (interne dreinering)
The flow of water within and through the solum.

internal friction (interne wrywing)

The portion of the shearing strength of a soil indicated by the term ρtanΘ in Coulomb's equation : s = c + ρtanΘ, where s = shearing strength, c = effective cohesion, ρ = effective stress and Θ the angle of internal friction. It is usually considered to be due to the interlocking of the soil grains and the resistance to sliding between the grains.

inter-row cropping (tussenryverbouing)
The practice of cultivating a crop between the rows of another crop, sometimes deliberately leaving space for such cropping.

interstice (tussenruimte)
The pore space or voids in soils and rocks.

interstitial (tussenruimtelik)
Derived from interstice, a minute crack or space separating solid particles.

interstratified clay mineral (tussengelaagde kleimineraal)
In these minerals different types of unit layers alternate in a regular or irregular manner, and may contain two or more different types, e.g. vermiculite with chlorite, mica with smectite and chlorite.

intrazonal soil (intrasonale grond)
An obsolete soil classification term referring to a soil with more or less well-developed soil characteristics that reflect the dominating influence of some local factor of topography, parent material, or time, over the normal effect of climate and vegetation.

intrinsic permeability (intrinsieke permeabiliteit)
See soil water : intrinsic permeability.

intrusive rock (intrusiewe gesteente)
A rock formed from the cooling and solidification of magma deep within the earth, resulting in a coarse-grained texture. Cf. extrusive rock; igneous rock. Syn. plutonic rock.

ion (ioon)
An atom or group of atoms that are positively charged (cations) because of the loss of one or more electrons, or that are negatively charged (anions) because of a gain of one or more electrons. Cf. anion; cation.

ionic substitution (ioonsubstitusie)
See isomorphous substitution.

iron pan (ysterbank)
See hardpan; laterite hardpan.

irrigation efficiency (besproeiingsdoeltreffendheid)
The ratio of the water actually consumed by evapotranspiration on a specified area to the amount of water diverted from the source onto the area. Cf. application efficiency; distribution efficiency; transmission efficiency; replenishment efficiency.

irrigation (besproeiing)
The artificial application of water to the soil for the benefit of growing crops.

irrigation methods (besproeiingsmetodes)

An irrigation method is the manner in which water is artificially applied to an area. The methods and manner of applying the water are as follows:

basin **- The water is applied rapidly to relatively level plots surrounded by levees. The basins are relatively large and range normally from 0,2 to 4,0 ha.**

border-strip **- The water is applied at the upper end of a strip or bed with earth borders to confine water to the strip (synonymous with irrigation-bed method).**

centre-pivot **- Sprinkler irrigation achieved by automatically rotating the sprinkler pipe or boom, which supplies water to the sprinkler heads or nozzles. Water is delivered to the centre or pivot point of the system. A circular or partly circular area is irrigated.**

check-basin **- The water is applied rapidly to relatively level plots surrounded by levees. Normally used in orchards where one to four basins per tree is used.**

corrugation **- The water is applied to small, closely-spaced furrows, frequently in grain and forage crops, to confine the flow of irrigation water to one direction.**

drip **- The water emerges from an emitter at low pressure and at a low flow rate to wet a given spot on the soil surface. Syn. trickle.**

flood **- The water is released from field ditches or low-pressure pipelines and allowed to flood over the land.**

furrow **- The water is applied to row crops in ditches made by tillage implements.**

irrigation-bed **- See border-strip.**

micro-irrigation **- Water is applied in small amounts with the spesific aim to keep the matric potential high. The distribution system consists of a permanent pipe network with emitters which can be either drippers, microjets or micro sprinklers.**

sprinkler **- The water is sprinkled over the soil through rotating sprinklers operating under pressure. Several systems are possible, e.g. permanent, semi-permanent, hand-move or mechanized systems. In mechanized sprinkler systems the moving of water emitters (i.e. sprinklers, guns, spray booms) is mechanized to eliminate or decrease labour. Different systems such as centre-pivot, side-roll, linear-move, travel-gun, boom-irrigator and tow-line are used.**

subsurface irrigation **- The water is applied in open ditches or tile lines until the water table is raised sufficiently to wet the soil. Syn. subirrigation.**

trickle **- Syn. drip.**

wild-flooding **- The water is released at high points in the field and distribution is uncontrolled.**

irrigation requirement (besproeiingsbehoefte)

The quantity of water that must be artificially applied for crop production. It includes surface evaporation and other unavoidable water losses.

isohyet (isohieet)
A line on a map connecting points of equal rainfall.

isomorphous series (isomorfe reeks)
Two or more crystalline substances that display isomorphism. Their physical properties vary along a smooth curve. An example is olivine, usually found in nature as a solid solution of Mg_2SiO_4 and Fe_2SiO_4, i.e. an isomorphous series between forsterite and fayalite. The exact lattice dimensions and other physical properties vary with change of the Mg:Fe ratio.

isomorphous substitution (isomorfe substitusie)
The replacement of one atom by another of similar size (but not necessarily of the same valence) in a crystal structure without disrupting or seriously changing the structure.

isopleth (isopleet)
A line connecting points of equal ratio.

isostasy (isostasie)
The tendency to maintain an even gravity balance at the earth surface despite denudation and deposition.

isotherm (isoterm)
(1) A line on a map connecting points of equal temperature.
(2) A curve on a graph showing the relationship between two variables at a constant temperature, e.g. adsorption isotherm, exchange isotherm, etc.

isotope (isotoop)
Isotopes of an element have an identical number of protons in their nuclei but differ in the number of their neutrons. Isotopes have the same atomic number, different atomic mass and almost but not quite the same chemical properties.

isotropic (isotroop)
(1) Refers to a medium whose properties are the same in all directions, e.g. in crystal optics, said of a crystal whose physical properties do not vary according to crystallographic directions, e.g. light travels with the same speed in any direction. Cubic crystals and amorphous substances are usually isotropic.
(2) Isotropic soil : Soil having similar properties in different directions at any given point; the term is normally used in the context of hydraulic properties and micromorphology. Cf. anisotropic soil.

J

jarosite (jarosiet)
A pale-yellow potassium iron sulphate mineral, $KFe_3(OH)_6(SO_4)_2$.

jasper (jaspis)
A variety of chert or chalcedony containing iron oxide impurities that give it various colours (red, brown, green).

jaspilite (jaspiliet)
A rock consisting of jasper and iron oxides in alternating bands.

joint (naat)
In geology, a fracture or parting which interrupts abruptly the physical continuity of a rock mass.

Jurassic (Jura)
See geological time scale.

K

kandite (kandiet)
A name for the kaolin group of clay mienrals, including kaolinite, nacrite, dickite and halloysite. Cf. kaolinite; nacrite; dickite; halloysite.

kandic horizon (kandiese horison)
See diagnostic horizon.

kaolin (kaolien)
A subgroup name of aluminium silicates with a 1:1 layer structure. Kaolinite is the most common clay mineral in the subgroup. Also, a soft, usually white rock composed largely of kaolinite.

kaolinite (kaoliniet)
A non-swelling clay mineral with a 1:1 crystal structure; i.e. each layer consists of one silicon-oxygen tetrahedral sheet and one aluminium oxide-hydroxide octahedral sheet. It has a CEC range of 5-10 $cmol_c/kg$. It is a member of the kandite group of minerals: $Al_4(Si_4O_{10})(OH)_8$.

karst (karst)
A type of topography that is formed over limestone, dolomite, or gypsum by dissolution and that is characterized by closed depressions or sinkholes, caves, and underground drainage. Etymol. German, from the Slavic *kars*, a bleak, waterless place.

Kastanozem (Kastanozem)
See soil classification.

katabatic wind (katabatiese wind)
Downslope convectional flow of air, e.g. as a result of surface cooling at night. Also known as mountain wind.

kieselguhr (kieselgoer)
See diatomaceous earth.

kimberlite (kimberliet)
An intrusive igneous rock consisting largely of peridotite and often containing diamonds.

knickpoint (knakpunt)
A break of slope in the hill-slope profile, or where a new erosion cycle intersects an older cycle. In a river system the knickpoint recedes upstream as erosion proceeds.

krotovina (krotovien)
See crotovine.

kurtosis (kurtose)

A measure of the flatness or peakedness of a distribution curve. Kurtosis of a normal distribution is around 3. As values decrease below 3, the curve becomes flatter. Cf. sorting.

kyanite (kianiet)

Al_2SiO_5, triclinic. Characterized by its bladed crystals, good cleavage and blue colour.

L

L layer (litter) (L-laag)
The surface layer of the forest floor consisting of freshly fallen and easily recognizable leaves, needles, twigs, stems, bark, and fruits. This layer may be very thin or absent during the growing season. The 01 horizon. See soil horizon.

labile (labiel)
Unstable; liable to displacement or change.

labile pool (labiele poel)
The sum of the amount of an element in the soil solution and the amount thereof readily solubilized or exchanged when the soil is equilibrated with a salt solution.

labradorite (labradoriet)
See feldspar group of minerals.

laccolith (lakkoliet)
A concordant igneous intrusive body that has domed up the overlying rocks.

lacustrine deposit (meerafsetting)
Material deposited in lake water and later exposed either by lowering of the water level or by the elevation of the land.

lamella (lamella)
(1) A lamella is a wavy, horizontally orientated layer, in a vertical section often branched and which, relative to the surrounding soil, is enriched in one or more of aluminosilicate clays, sesquioxides and organic matter.
(2) Any thin or plate-like structure, e.g. a layer of cells.

laminar flow (laminêre vloei)
Flow in which there are no cross currents or eddies and where the fluid elements move in approximately parallel directions.

land (land)
(1) The exposed part of the earth's surface as distinguished from the submerged part.
(2) The total natural environment of the exposed part of the earth's surface, including atmosphere and climate, soils and vegetation, animals, surface water and geological formations.
(3) The total natural and cultural environment.

land capability (landvermoë)
This is the extent to which land can meet the needs of one or more uses under defined conditions of management, including climate, on the total suitability for use without damage for crops that require regular tillage, for grazing, for woodland, and for wildlife. A more general term than land suitability and more conservation orientated. Cf. land suitability. Land capability involves consideration of (i) the risks of land damage from erosion and other causes and (ii) the difficulties in land use owing to physical land characteristics, including climate.

land capability class (landvermoëklas)

A grouping that contains land with similar capabilities. The classes defined in two classification systems are outlined below:

(1) The South African Land Capability Classification (Scotney *et al*, 1987):

(a) Arable land capability classes

Class I: Land in Class I has few permanent limitations that restricts its use and has very high potential for intensive crop production.

Class II: Land in Class II has some permanent limitations that reduce the degree of intensity of crop production but is nevertheless of high potential.

Class III: Land in Class III has severe permanent limitations that restrict the choice of alternative uses and the intensity of crop production and is of moderate potential.

Class IV: Land in Class IV has very severe permanent limitations that greatly restrict the choice of alternative uses and the potential for crop production.

(b) Non-arable land capability classes

Class V: Land in Class V is unsuitable for the cultivation of annual crops, but has very slight erosion hazard under natural veld, established pastures, forestry or special crops.

Class VI: Land in Class VI has permanent limitations that make it unsuited to cultivation and limit its use to natural grazing, veld re-inforcement, afforestation or wildlife.

Class VII: Land in Class VII has very severe permanent limitations that render it unsuitable for cultivation or intensification and restrict its use to natural grazing, afforestation or wildlife.

Class VIII: Land in Class VIII has permanent limitations that preclude its use for commercial plant production and restrict its use to wildlife, recreation, water supply or aesthetic needs.

(2) The US Soil Conservation Service Classification (Soil Conservation Society of America, 1976):

(a) Land suitable for cultivation and other uses

Class I: Soils that have few limitations restricting their use.

Class II: Soils that have some limitations, reducing the choice of plants or requiring moderate conservation practices.

Class III: Soils that have severe limitations that reduce the choice of plants or require special conservation practices, or both.

Class IV: Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.

(b) Land generally not suitable for cultivation (without major treatment)

Class V: Soils that have little or no erosion hazard, but that have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife food and cover.

Class VI: Soils that have severe limitations that make them generally unsuited for cultivation and limit their use largely to pasture or range, woodland or wildlife food and cover.

Class VII: Soils that have very severe limitations that make them unsuited to cultivation and that restrict their use largely to grazing, woodland, or wildlife.

Class VIII: Soils and landforms that preclude their use for commercial plant production and restrict their use to recreation, wildlife, water supply, or aesthetic purposes.

land capability classification (landvermoëklassifikasie)
See land capability class.

land capability map (landvermoëkaart)
A map showing the distribution of land capability units, subclasses and classes.

land characteristic (landkenmerk)
An attribute of land that can be measured or estimated.

land classification (landklassifikasie; terrein-)
The arrangement of land units into classes and categories based on the properties of the land or its suitability for some particular purpose.

land evaluation (matching) (landevaluering (passing))
See matching (land evaluation).

landform (landvorm)
A three-dimensional part of the land surface, formed of soil, sediment, or rock that is distinctive because of its shape, that is significant for land use or to landscape genesis, that repeats in various landscapes, and that also has a fairly consistent position relative to surrounding landforms.

land limitation (landbeperking)
Any land characteristic which adversely affects the potential of land for a specified kind of use.

land reclamation (landherwinning)

Making land capable of more intensive use by changing its general character, as by drainage of excessively wet land; irrigation of arid or semi-arid land; or recovery of submerged land from seas, lakes and rivers. Large-scale reclamation projects usually are carried out through collective effort. Simple improvements, such as cleaning of stumps or stones from land, should not be referred to as land reclamation.

landscape (landskap)
All the natural features, such as fields, hills, forests, and water that distinguish one part of the earth's surface from another part; usually that portion of land or territory which the eye can comprehend in a single view.

landslide (grondverskuiwing)
(1) A mass of material that has slipped downhill under the influence of gravity, frequently occurring when the material is saturated with water.
(2) Rapid movement downslope of a mass of soil, rock or debris.

land suitability (landgeskiktheid)
The suitability of a given type of land for a specified kind of land use.

land type (landtipe)
(1) A class of land with specified characteristics.
(2) In South Africa it has been used as a map unit denoting land, mappable at 1:250 000 scale, over which there is a marked uniformity of climate, terrain form and soil pattern.

land use (landgebruik)
The use to which land is put.

land use plan (landgebruikplan)
The key elements of a comprehensive plan; describes the recommended location and intensity of development for public and private land uses such as residential, commercial, industrial, recreational and agricultural.

laterite (lateriet)
See hardpan; lateritic weathering.

laterite hardpan (lateriet-hardebank)
Synonymous with ironpan (see hardpan). It is not the result of lateritic weathering but the absolute accumulation of sesquioxides (mainly iron) in the zone of a fluctuating water table.

lateritic duripan (lateriet-duribank)
See duripan.

Lateritic Soil (Lateritiese Grond)
A suborder of zonal soils formed in warm, temperate, and tropical regions and including the following great soil groups: Yellow Podzolic, Red Podzolic, Yellow-brown Lateritic and Lateritic. Cf. soil classification; Latosol.

lateritic weathering (lateritiese verwering)

A term used to describe the process of soil formation which, in freely drained conditions, results in a loss of Ca, Mg, K, Na and silica and a relative accumulation of sesquioxides. It leads to the formation of fersiallitic and ferrallitic soils. Laterite hardpan is not the result of lateritic weathering but of the absolute accumulation of sesquioxides (chiefly iron) in the zone of a fluctuating water table.

Latosol (Latosol)

(1) A general term in tropical pedology for soils that have reached a fairly advanced stage of lateritic weathering.

(2) A suborder of zonal soils including soils formed under forested, tropical, humid conditions and characterized by low silica-sesquioxide ratios of the clay fractions, low cation-exchange capacity, low activity of the clay, low content of most primary minerals, low content of soluble constituents, a high degree of aggregate stability, and usually having a red colour. See soil classification; Lateritic Soil; Oxisol; Ferralsol.

lattice (rooster)

The three-dimensional regular array of atoms in a crystal. Cf. layer; sheet.

lava (lawa)

(1) Molten rock that issues from a volcano or a fissure in the earth's surface.

(2) The same rock when cooled and solidified.

layer (laag)

A repetitive unit of a layer lattice mineral, consisting of a number of sheets. The atoms within a layer are more strongly bonded to each other than are the atoms of adjoining layers. Cf. lattice; sheet.

layer silicate (fillosilikaat; laagsilikaat)

Syn. phyllosilicate.

layer silicate mineral (laagsilikaatmineraal)

A mineral with the sheet silicate structure of the phyllosilicates. Cf. phyllosilicate.

leach (loog)

The removal of soluble constituents by percolating water. Cf. eluviation; illuviation.

leachate (loogwater)

The liquid that has percolated through a soil and that contains substances in solution or suspension.

leaching fraction (logingsfraksie)

The fraction of applied irrigation water passing through the root zone under a given water management regime.

leaching requirement (logingsvereiste)

The leaching requirement (LR) is the minimum leaching fraction which can be relied upon to control salts to within the tolerance of the particular crop grown, considering the quality of the water used. The leaching requirement equation is given by

$$LR = EC_{iw} / \text{maximum } EC_{dw}$$

where EC_{iw} refers to the electrical conductivity of the irrigation water, and maximum EC_{dw} reflects the maximum permissible salinity (electrical conductivity) of the percolating water draining from the root zone, and which results from the removal of water by the particular crop in meeting its water requirement for growth. This approach is strictly speaking applicable only for steady state conditions assuming that no precipitation or dissolution of salts occurs in the profile.

leaf analysis (blaarontleding)
The analysis of a specified leaf or leaves of a plant for its content of one or more elements, mostly plant nutrients.

legend, map (legende, kaart-)
A list, usually shown as marginal information on a map, giving an explanation of or identifying symbols used in the map.

lens (lens)
In geology, a body of rock or unconsolidated sediment, thick in the middle and thinning towards the edges.

lepidolite (lepidoliet)
A mineral of the mica group: $K(Li,Al)_3(Si,Al)_4O_{10}(F,OH)_2$. It commonly occurs in rose- or lilac-coloured masses made up of small scales, as in pegmatites. Syn. lithium mica; lithia mica; lithionite.

lepidocrocite (lepidokrosiet)
A common minor constituent of soil clays in humid temperate regions, γ-FeOOH. It is found in non-calcareous seasonally waterlogged soils in which oxidizing and reducing conditions alternate, frequently as strong orange coloured mottles. In soils of tropical regions maghemite (γ-Fe_2O_3) appears to take its place.

Leptosol (Leptosol)
See soil classification.

leucoxene (leukokseen)
A general term for fine-grained, opaque, whitish alteration products of ilmenite, commonly consisting mostly of rutile and partly of anatase or sphene, and occurring in some igneous rocks. The term has also been applied to designate a variety of sphene.

levee (oewerwal)
A natural or artificial embankment along a river or stream.

lichen (ligeen)
A composite organism formed from the symbiotic association of certain fungi and a green alga or cyanobacterium, forming a simple thallus, found encrusting rocks, tree trunks, etc., often in extreme environments.

ligand (ligand)
See complex.

light soil (obsolete) (ligte grond (verouderd))
A coarse-textured soil with a low drawbar pull and, hence, easy to cultivate. Cf. coarse texture; soil texture.

lignin (lignien)
Organic substances associated with the cellulose in plant cell walls, especially xylem.

lignite (ligniet)
A brownish-black coal; in the alteration of vegetal material it has proceeded further than peat but not so far as sub-bituminous coal.

limburgite (limburgiet)
A dark-coloured, porphyritic extrusive igneous rock having olivine and clinopyroxene as phenocryst minerals in an alkali-rich glassy groundmass. The latter may have microlites of clinopyroxene, olivine, and opaque oxides; some nepheline and/or analcime may be present, and feldspars are typically absent. Its name is derived from Limburg, Germany. Syn. magma basalt.

lime (kalk)
Calcium oxide, CaO. Loosely used for calcium carbonate and calcium hydroxide.

lime, agricultural (landboukalk)
A soil amendment consisting principally of calcium carbonate but may include magnesium carbonate and other materials, used to neutralize soil acidity and to supply calcium and magnesium for the growth of plants. Calcium carbonate is often termed agricultural or calcitic lime to distinguish it from dolomitic lime. Dolomitic lime contains at least 15% $MgCO_3$ while calcitic lime contains less than 15% $MgCO_3$. Recognized agricultural lime contains at least 70% $CaCO_3$ equivalent and its degree of fineness must be such that at least 30% passes through a 250 μm sieve (60 mesh US) and 100% passes through a 1700 μm sieve (10 mesh US).

lime chlorosis (kalkchlorose)
A yellowing (chlorosis) of plant leaves due to a deficiency of a micronutrient in a calcareous soil.

lime concretion (kalkkonkresie)
An aggregate of precipitated calcium carbonate, or of other material cemented by precipitated calcium carbonate.

lime pan (kalkbank)
A hardened layer cemented by calcium carbonate.

lime potential (kalkpotensiaal)
The value of pH - ½p(Ca + Mg), or $-\log_{10}a_H/(a_{Ca+Mg})^{½}$. Some soil scientists consider the lime potential to be a more characteristic soil property than pH, since it remains essentially constant under conditions that cause the pH to change.

lime requirement (kalkbehoefte)

The mass of agricultural lime of specified physical properties, or other specified liming material, required to raise the pH of a given mass of soil (area and depth) to a desired value under field conditions.

limestone (kalksteen)
A sedimentary rock consisting mainly of calcium carbonate, deposited as the calcareous remains of marine animals, or chemically precipitated from the sea; used as a building stone, for the manufacture of cement, lime, agricultural lime, etc.

limestone ammonium nitrate (LAN) (kalksteenammoniumnitraat (KAN))
A nitrogenous fertilizer containing approximately 28% N and 20% $CaCO_3$ Abbr. LAN. See ammonium nitrate.

liming (bekalking)
The application of agricultural lime or a liming material to land, primarily to reduce soil acidity and supply calcium for plant growth. Dolomitic lime supplies both calcium and magnesium for plant growth. Cf. agricultural lime.

liming material (bekalkingsmateriaal)
Any material used in agriculture to raise the pH of acid soils to a satisfactory level; it can contain $Ca(OH)_2$, $CaCO_3$, $CaMg(CO_3)_2$ or other neutralizing substances.

limnology (limnologie)
The study of bodies of fresh water with reference to their plant and animal life, physical and chemical properties, geographical features, etc.

limonite (limoniet)
A common brown, black, or yellow amorphous secondary mineral that consists of hydrated ferric oxides: $FeO(OH).nH_2O + Fe_2O_3.nH_2O$.

linear extensibility (lineêre uitsetting)
See coefficient of linear extensibility.

line of seepage (sypellyn)
The free-water surface of a zone of seepage. Syn. phreatic line.

liquid fertilizer (vloeibare misstof)
See fertilizer.

liquid limit (vloeigrens)
See Atterberg limits.

liquid waste (vloeibare afval)
A general term denoting pollutants such as soap, chemicals or other substances in liquid form.

liquid ratio (vloeistofverhouding)
See soil water : liquid ratio.

lithocutanic B horizon (litokutaniese B-horison)
See diagnostic horizon.

lithologic discontinuity (litologiese diskontinuïteit)

(1) A boundary or layer at depth, marked by a significant change in the speed of transmission of seismic waves.

(2) In soil science, a term used to designate two contrasting soil materials or horizons indicative of different origins. Often used in detailed soil profile descriptions.

lithology (litologie)

The study and description of the mineralogical composition and texture of rocks using megascopic procedures. The study of rocks using thin section procedures and chemical analysis is known as petrography.

lithosequence (litoreeks)

A group of related soils that differ, one from the other, in certain properties primarily as a result of differences in the parent rock as a soil-forming factor.

Lithosol (obsolete) (Litosol (verouderd))

See soil classification.

lithosol (litosol)

Soils (usually shallow) consisting of freshly and imperfectly weathered rock or rock fragments with no clearly expressed soil morphology. Syn. skeletal soils.

lithosphere (litosfeer)

The solid part of the earth, as opposed to the atmosphere and hydrosphere.

litter layer (afvallaag)

A layer of dead plant material upon the soil's surface.

littoral (litoraal)

(1) Pertaining to the benthic ocean, environment, or depth zone between high water and low water; also pertaining to the organisms of that environment.

(2) Pertaining to the depth zone between the shore and a depth of about 200 m.

Lixisol (Liksisol)

See soil classification.

loam (leem)

A soil textural class. See soil texture.

loamy (leem-)

Intermediate in texture and properties between fine and coarse classes with the words "loamy" and "loam" as a part of the class name, such as clay loam, loamy sand, loamy coarse sand, loamy fine sand. See soil texture.

loess (loes)

A sediment, commonly non-stratified and unconsolidated, composed dominantly of silt-size particles, ordinarily with accessory clay and sand, usually highly calcareous, deposited primarily by wind.

loose (los)

A soil consistence term. See soil consistence.

low biuret urea (laebiuretureum)
An urea fertilizer, specially manufactured to contain less than 0,3% biuret for use as a foliar spray and on crops sensitive to biuret toxicity.

lower plastic limit (uitrolgrens)
See Atterberg limits.

lunette (lunette)
Dunes formed as arcuate mounds on the lee side of deflated basins or depressions, pans, lagoon or river segments. They may be composed either of normal quartz dune sand, or of soil aggregates, and are a feature of arid and semi-arid areas.

luvic (luvies)
A term that refers to a soil in which the essential characteristic to the markedly higher clay content in the B horizon relative to the A or E horizons. The clay increase is mainly due to illuviation. Cf. diagnostic horizon.

luvic B horizon (luviese B-horison)
See diagnostic horizon.

Luvisol (Luvisol)
See soil classification.

luxury uptake (luukse opname)
The absorption by plants of nutrients in excess of their need for growth. Luxury concentrations during early growth may be utilized in later growth.

lysimeter (lisimeter)
A device employed under field conditions and preferably utilizing a block of undisturbed soil, for measuring percolation and losses of nutrients and other salts through leaching, under controlled conditions, from a column of soil; or for measuring gains (precipitation and condensation) and losses (evapotranspiration) of water by a column of soil.