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WESTERN AUSTRALIA. 166

FORESTS DEPARTMENT.

A GLOSSARY
OF
TECHNICAL TERMS USED
IN
FORESTRY PRACTICE.

PREPARED BY S. L. KESSELL, B.Sc.,
under the direction of
C. E. LANE-POOLE,
Conservator of Forests.

Issued under the Authority of the Minister for Forests,
THE HON. JOHN SCADDAN, M.L.A.

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This Glossary is based on terms and definitions at present in use in British and Indian Forest Services, with adaptations to meet Australian conditions.

A GLOSSARY OF TECHNICAL TERMS USED IN FORESTRY PRACTICE.

Abnormal Forest.—A forest in which the quantity of material in the growing stock is insufficient or superabundant; or in which the proportion between the age classes is defective. (See "Normal Forest.").

Acid Humus.—Humus which is too wet and insufficiently aerated, thus obstructing rather than aiding the growth of forest vegetation.

Advance Growth.—Young trees which have sprung up in openings in the forest or under the forest cover before regeneration operations are begun.

Adventitious Buds.—Those produced irregularly from any part of the stem, leaves, or roots.

Adventitious Roots.—Those which are developed in abnormal positions or out of their proper order.

Age.—The age of a regular or even-aged crop is the mean age of the trees composing it. In a crop of mixed ages, the age of the class (of trees of the principal species) most numerous represented is generally taken and alluded to as the **predominant age**.

Aged, Even.—When the crop is approximately all of one age class. (See "Crop.").

Alburnum.—Sapwood, q.v.

Analysis, Stem.—See "Stem Analysis."

Annual Ring.—The layer of wood produced by the growth of one year, as seen in cross-section.

Artificial Regeneration.—Regeneration obtained by sowings, plantings, or other artificial means. (See "Regeneration.").

Aspect.—The direction in which a forest faces.

Assessment of the Quality of the Locality.—The determination by actual measurements of the quantity of material which a given area is capable of producing under normal conditions as long as the factors of the locality remain unchanged.

Auxiliary Species.—A useful species of less value than the principal species, which assists the growth of the latter and influences, in a smaller degree, the method of treatment.

Average Annual Increment.—The total material in a tree or crop divided by its age in years.

Age Class.—All trees of a specified age and species within a forest.

Basal Area.—The area of a cross-section of the butt of a tree at a specified height above the ground or the sum of such areas of all trees on a unit of area.

Blank.—An unstocked area where, from any cause, few or no trees are growing.

Blaze.—An artificial wound by which a portion of the bark, with or without wood, is taken off a tree or timber.

Block.—A natural main division of a forest made up of a group of compartments containing at least one complete series of age classes whose yield is calculated separately. It generally bears a local proper name and forms non-professional officer's range.

Bole.—The trunk or stem of a tree from the ground to the point where its main branches are given off. The lower part of the bole, if free of any branches, is called the **clear bole**.

Boom.—A contrivance by means of which the passage of timber down a floating stream is automatically arrested.

Breast-high.—A height of 4ft. 3in. above the ground.

Broadcast Sowing.—When seed is scattered over the whole area to be stocked.

Broad-leaved Trees.—A distinguishing term in distinction to conifers.

Burr.—An abnormal swelling on the bole or branch of a tree, often caused by an accumulation of dormant buds.

Butt.—A short piece cut off the thick end of a log.

Calliper.—An instrument for measuring the diameter of round timber or standing trees.

Canopy; or Leaf Canopy.—The mass of foliage formed by the crowns of a collection of trees in a forest.

Canopy Density.—The comparative impermeability to light of the mass of foliage formed by the crowns of the trees in a forest. The following degrees of density are recognised:—**Close canopy, Open canopy, and Interrupted canopy.**

Catchment Area.—The total area from which aqueous precipitations flow into a given watercourse.

Cattle.—Includes bulls, cows, oxen, horses, mares, geldings, sheep, goats, pigs, and generally all domestic animals.

Chute.—A natural or artificial declivity down which timber or fuel descends by the force of gravity.

Clear Fell, To; or Clear Felling.—A complete removal of the standing crop. A clear felling may be in strips, in patches, or in compartments.

Close, To.—To prohibit entry into a forest for the purpose of exercising any definite act such as firing, grazing, felling, shooting, removal of grass and minor produce.

Close Canopy.—When the branches or crowns of the trees interlace, or at least touch one another, without being shaken by the wind. When the cover formed is uninterrupted and the ground is shaded.

Close Time.—The period during which a forest is closed, or game is protected.

- Clump.**—The aggregate of stems issuing from the same root or stool.
- Commutation of Rights.**—The payment of compensation in cash or kind in lieu of rights claimed in a forest.
- Compartment.**—The unit of permanent division of a forest. Compartments within any one forest should be as approximately equal in area and as homogeneous as regards soil, composition, and age of the crop as natural topographic features will allow. They should be numbered according to a recognised system for easy reference.
- Composition.**—The various species which form the crop, their proportion and condition.
- Conifer.**—A tree, usually evergreen and resinous, the flowers of which are generally cones and its leaves needle-shaped.
- Conservancy.**—A number of districts forming a Conservator's range.
- Constitution.**—The presence of the different age-classes in a crop and their distribution.
- Control Books.**—Registers compiled with a view to recording the treatment to which forests have been subjected in accordance with the prescriptions of regular working-plans, and the results of such treatment.
- Conversion of System.**—A change from one silvicultural system to another, or from a temporary to a systematised and more permanent method of treatment.
- Conversion Period.**—The period during which the change from one system of forest management to another is effected.
- Conversion of Timber.**—The work of dividing felled trees into pieces of dimensions suitable for utilisation.
- Coppice; or Coppice Forest.**—A crop mainly composed of trees derived from stool or root-shoots.
- Coppice, To.**—Possessing the power of sending up root or stool-shoots when cut flush with or close to the ground.

- Coppice and Seedling Forest.**—A forest in which coppice shoots and trees from seed are allowed to grow together and are cut simultaneously. (See “Coppice with standards.”).
- Coppice Felling.**—A removal of the whole of the forest crop with a view to regeneration from the shoots and suckers of the stems felled.
- Coppice Shoot.**—A stem which has sprung from a stump or root and not from seed.
- Coppice System, Simple.**—The formation by means of stool and root-shoots of a forest crop which is periodically removed by clear felling. The regeneration fellings in this method are called **coppice** fellings.
- Coppice with Standards.**—A two-storeyed forest in which coppice shoots form the lower, and selected coppice shoots or seedling trees the upper storey. (See “Coppice and seedling forest.”).
- Cost Value.**—The total outlay on the acquisition or production of property.
- Counterfire.**—A fire started purposely some distance in advance of a forest fire with the object that both may be extinguished when they meet.
- Coupe.**—An area to which felling operations are confined for a specified period.
- Cover; or Covering.**—The term “cover” is used to express the horizontal projection of the crown on the ground, and is applied both to the ground so covered and also to the action of the cover. (See “Interrupt the cover.”).
- Cover, Ground or Low.**—The shade afforded by small plants not being a portion of the forest crop, such as ferns, mosses, grasses, and weeds.
- Creeper.**—Plants with stems which extend their growth horizontally. A frequent misnomer for climber.
- Crop.**—The entire collection of trees growing on a given area. The terms *stock*, *growing stock*, *tree-growth*,

and crop are synonymous. A crop may be complete or incomplete (interrupted), pure or mixed, even-aged or uneven-aged; and it may be described as crowded, close, dense, open, or thin.

Forest crops may be classified as follows in terms of their stages of development:—

Seedlings.—From the germination of the seeds to the time when the plant reaches 5 feet in height.

Sapling.—From the time the young plant reaches 5 feet in height until it becomes 5 inches breast-high diameter.

Poles.—From the time the plant measures 5 inches breast-high diameter to the time when the crop attains its full height.

Trees.—From the time of the stems having attained their full height.

Crop Density.—The degree of completeness of the leaf canopy of the trees. This is usually expressed by a co-efficient: but may be described by stating the species, their age, and the number of stems per unit of area.

Crown.—The collection of main branches and foliage overtopping the bole. In an even-aged forest crop the following crown classes are recognised:—

Dominant.—Trees with a well-developed crown, standing over other trees or by themselves.

Dominated.—Trees with an incomplete crown, partly below the level of the dominant trees.

Suppressed.—Trees with the crown wholly below the level of the dominant trees.

Crown Fire.—A forest fire which spreads to the crowns of the trees.

Cultural Operations—

1.—Operations undertaken with the object of filling up blanks in forests, such as the sowing or planting of areas where natural reproduction of the desired species is unlikely or impossible.

2.—Operations carried out with a view to assisting young crops; cleanings.

Cupshakes.—Cracks in timber following the direction of the concentric rings of growth, and extending from only an inch or two to the whole way round, when they are termed “ring-shakes.”

Current Annual Increment (applied to height, girth, basal area, volume).—The increase in height, girth, basal area, or volume added in a given year by the growth of a tree or crop.

Cutback, To.—The operation of cutting flush with the ground or stool any stem, younger than a formed tree, with the object of obtaining superior growth by coppice regeneration.

Cutting.—A short length of stem, branch, or twig put into the ground in order that it may develop into a new plant.

Cutting Cycle.—The period of years elapsing between two successive principal fellings on any one area. Thus in the clear cutting system the cutting cycle would correspond with the rotation, but, in the case of a selection forest, is any number of years arbitrarily fixed by the forester. The shorter the cutting cycle the more nearly does the working approach a true selection forest.

Cutting Operations.—Removal of major forest produce with a view to promoting or providing for the restocking of the area with a fresh crop.

Deciduous.—A tree which is leafless for some time during each year.

Defoliate, To; or Defoliation.—The shedding or loss of leaves owing to either natural or abnormal causes.

Demarcation.—The act of setting out or marking the limits or boundaries of a forest.

Dendrology.—The natural history of trees.

- Dense.**—A term applied to a crop which is so fully stocked that the crowns of the trees interlace and form an uninterrupted leaf canopy which completely shelters the ground. (See "Crop.")
- Density of Crop.** (See "Crop density.")
- Denudation.**—Divesting the soil of its vegetative covering, or the rock of its soil.
- Depot.**—A site on which forest produce is collected.
- Determination of the Yield; or Fixing the Possibility.**—The calculation or determination of the maximum quantity of material which may, for the time being, be annually removed from a forest consistently with such treatment as shall tend to produce and maintain the greatest constant outturn; or otherwise maintain the objects of management.
- Dibble, To.**—To sow seed at intervals on prepared patches.
- Direct Sowing.**—The formation of a wood by the sowing of seed directly on the area which it is proposed to stock.
- District.**—One or more Working Circles forming a single administrative range. It usually forms a Senior Professional Officer's range.
- Dominant.**—A tree which has raised its crown above the level of the surrounding trees. (See "Crown.")
- Dominated.**—A tree of which the crown is overtopped by the surrounding trees.
- Dormant or Latent Buds.**—*Buds which remain quiescent, showing vitality only under specially stimulating conditions.*
- Drainage Area.**—The whole area drained by a particular stream.
- Dry Slide.**—A chute down which the sliding timber is not assisted by water.
- Dry-topped.**—Having a dead or partially defoliated crown, as the result of injury or disease.
- Dunes.**—Areas of drifting sand forming, by the action of wind, moving hills of considerable height.
- Duramen.**—Heartwood, q.v.

- Epicorm**; or **Epicormic Branch**.—A term applied to those clusters of small branches which make their appearance on the stem of a tree that has been exposed to adverse influences, such as excessive light or heat.
- Epiphyte**.—A plant attached to, but not nourished by, another plant.
- Even-aged Crop**.—A crop of trees of approximately the same age.
- Evergreen Tree**.—A tree, the leaves of which persist at least for an entire year, so that it is never leafless.
- Exotic**.—A plant, shrub, or tree introduced from another locality.
- Expectation Value**.—The present net value of all yields which a property may be able to give.
- Experimental Area or Plot**.—A forest area of known size upon which investigations are carried out for the determination of the growth and behaviour of the growing stock, or to ascertain the effect of various methods of treatment.
- Exploit, To**.—To work a forest for its material in accordance with the principles of silviculture.
- Exploitation**.—The operation of working a forest silviculturally for its material.
- Factors of the Locality**.—Local conditions influencing forest growth, such as elevation above mean sea level, soil, slope, aspect.
- False Ring**.—The layer of wood, less than a full season's growth, and seldom extending around the stem, which is formed when the diameter growth of a tree is interrupted and is resumed during the same growing season.
- Fascine**.—A bundle of branchwood used for a specific purpose, such as arresting the movement of sand, or holding up the soil.

Final Yield.—Material derived from clear or regeneration fellings; or, the return yielded by the final cutting of the wood, whether the old crop is removed in one cutting or by a number of successive cuttings.

Financial Rotation.—The rotation under which a forest yields the highest net return.

Fire, Forest.—A fire which travels over forest land. A forest fire may be a ground fire, a surface fire, a stem fire, a crown fire, according as to whether the fire burns in the forest floor, or runs over the undergrowth, or ignites the stems or crowns of the trees.

Firebreak.—A strip of land kept clear of inflammable material and used as a means of protection against the outbreak or spread of forest fires and as a line from which to set a counter fire.

Firewood—

1.—Wood for fuel.

2.—Wood below a certain diameter or girth.

For statistical purposes, European Forest Research Institutes have agreed to take a girth of 2 decimetres (7.874 inches) as separating timber from firewood or small wood.

Flush with the Ground.—Close to, or level with, the soil; term applied to coppice fellings.

Fodder.—Grasses and herbage, as well as the leaves and young shoots of trees and shrubs collected for the purpose of feeding cattle.

Forest.—An area of land covered with trees. Both the land and the plants on it are included in the term forest. (See "Stand.")

Forest Administration.—The effective carrying out in detail of a forest policy.

Forest Capital.—The capital which a forest represents. It consists of the forest land, or fixed capital, and the growing stock or producing stock.

Forest Denudation.—Divesting the soil of its forest covering.

- Forest Floor.**—The deposit of vegetable matter on the ground in a forest. Litter includes the upper, but slightly decomposed, portion of the forest floor; humus the portion in which decomposition is well advanced.
- Forest Guard.**—An employee who has completed his apprenticeship and is gaining practical experience prior to examination for permanent appointment.
- Forest Humus.**—Decomposed organic matter of vegetable origin.
- Forest in Storey, or Storeyed.**—A crop composed of stems of different ages, the crowns of which are arranged in tiers.
- Forest Mensuration.**—The determination of the dimensions, volume, age, and increment of single trees and whole woods, to permit of the calculation of the material standing on a given area, the yield which a wood can give, and the value of single trees, whole woods, and forests.
- Forest Nursery.**—An area upon which young trees are grown for forest planting. Nurseries may be either permanent or temporary.
- Forest Offence.**—Any act punishable under a Forest Act, or under any regulations made under such Act.
- Forest per cent.; or Indicating per cent.**—The percentage or interest which the capital, represented by a wood, yields at various periods of the wood's life.
- Forest Plantation.**—Tree growth, established by sowing or planting on a defined area.
- Forest Policy.**—The main principles which govern the administration of a forest in the best manner for the attainment of a specified object.
- Forest Privileges.**—Temporary (or terminable) and defined grants by the owner of the forest to individuals or communities of the use of a forest or of its produce. The grants may be given free or on payment.

Forest Products.—All usable material yielded by the forest. Two classes are distinguished, Major and Minor.

Forest Protection.—Ensuring the security of the forest against unfavourable influences.

Forest, Pure.—A forest which consists of one species only.

Forest Utilisation.—The most appropriate method of harvesting, converting, and profitably disposing of forest produce.

Forest Valuation.—The determination of the value of the forest soil; the growing stock or the forest as a whole; and of the rental derivable from the soil or the forest as a whole.

Forestry.—The science and art of making the best permanent use of the forest.

Form Factor.—The proportion which exists between the volume of a tree, or portion of a tree, and that of a cylinder of the same base and height as the tree. The form factor is therefore a co-efficient with which the volume of such a cylinder must be multiplied in order to obtain the volume of the tree.

Various kinds of form factors are used in forestry:
Stem form factors, which refer only to the volume of the stem above ground.

Tree form factors, which refer to the stem and branches, omitting root wood.

Timber form factors, which refer only to the parts of the tree classed as timber.

According to the height above ground at which the base of the tree is measured, the following kinds of form factors may be distinguished:—

Absolute form factors.—The diameter is measured at any convenient height above the ground and the factor refers only to the part of the tree above that point.

True or normal form factors.—The diameter is measured at a constant proportion of the height of the tree, say 1/10th, 1/20th, etc.

Artificial form factors.—The diameter is measured at the most convenient height from the ground, namely, at breast-height.

Form Factor Class.—All trees in a crop so similar in form that the same form factor is applicable in determining their volumes.

Frost-hardy.—Unaffected by frost.

Frost-tender.—Liable to injury by frost.

Germinating Bed.—An area prepared for sowing by loosening of the soil and the removal of obstructive surface covering.

Germinating Power.—The ability to sprout or bud.

Germinating Test.—To subject a certain number of seeds to conditions which secure quick sprouting in order to accurately ascertain the percentage of good seed and hence its quality.

Germination—

1.—The act of sprouting or budding.

2.—Young forest growth, the result of the local sprouting of seed.

Girth Breast-high.—The girth of a tree at 4ft. 3in. above the ground, measured on the side of the tree where the ground is highest.

Gregarious Flowering.—Flowering of all or nearly all individuals of a particular species over a considerable area.

Gnarled.—Knotty; full of knots.

Ground Cover.—The shade afforded by small plants growing in a forest, except young trees, *i.e.*, ferns, mosses, grasses, and weeds.

Ground Fire.—A forest fire which burns in the forest floor. (See "Forest fire," "Forest floor.")

Group Method.—A method by which the exploitable crop is felled in small groups with a view either to induce regeneration or to favour the growth of established seedlings.

Growing Stock.—All the living material actually standing in a forest or in part of a forest at a certain time. (See "Crop.")

Growth.—The material produced in a tree, or on a given area, in a certain time.

Grub up, To (applied to stumps).—To dig up by the roots with an instrument.

Guide Line.—A narrow path, cleared on either side of a fire line or break, before the latter is burnt.

Habit.—The mode of life or development of a tree in the forest.

Habitat.—The locality in which a tree finds the conditions of soil and climate which it requires.

Hardwood—

(1) A timber requiring a load greater than 1,000lbs. to the square inch to produce an indentation of one-twentieth of an inch.

(2) A term loosely used for timber of Dicotyledonous or "broad-leaved" trees, the majority of which belong to this class.

Heartshakes.—Cracks in the centre of timber which may be due to excessive age or to an unfavourable condition of soil. (See "Shakes.")

Heart.—The partially decayed centre of the tree useless as timber.

Heartwood.—The inner and older zones of wood, usually distinguished from the immature sapwood by an actual change in the tissues (Duramen).

Heavy Thinning.—The removal of a part of an immature crop including a proportion of the dominant stems. (See "Thinnings.")

Heel-in, To.—To store young trees for planting.

Height Class.—That portion of a crop which is approximately of the same height.

Height Increment.—The growth of a tree in height during a specified period.

Herbage.—A low growth of small plants which never become woody.

High Forest; or Seedling Forest.—A forest composed wholly or mainly of trees grown from seed. (See "Crop.")

High Forest with Reserves System.—The whole crop standing on a portion of the area to be treated is felled in one operation with the exception of a few trees which are left to grow to a larger size. The entire area is in this way passed over once during the rotation.

Humus (see "Forest Humus").

Hybrid.—Plants resulting from cross-fertilisation of two species.

Hygrometric state of Air.—The degree of moisture to be found in the air; the absolute or relative humidity of the atmosphere.

Hygroscopicity of Soil.—The facility with which a soil spontaneously absorbs and retains moisture.

Hypsometer.—An instrument for measuring the height of a tree.

Impermeable (of Soil).—Soil which does not permit the passage of water.

Impoverishment (of the Soil).—Deterioration of those physical properties or chemical constituents of the soil which are beneficial to plant life.

Impregnation (of Timber).—The filling of the pores of timber with antiseptic solutions or preservatives.

Improvement Felling.—A provisional operation undertaken to improve the growth and composition of an existing crop by means of the removal of individuals impeding the development of others of greater promise than themselves; it may thus include the removal of mature trees of the principal species in order to hasten the establishment of a more vigorous

crop, as well as the removal of trees of other species, which by their cover render the extension of more valuable kinds impossible.

Increment.—The increase due to growth in a given time in the height, diameter (and girth), or volume of material of a tree or crop. Or, the material produced in a tree, or on a given area, in a given time. (See “Current annual increment,” “Mean or average annual increment,” “Height increment.”)

Increment, Mean Annual.—That which is obtained by dividing the increment added during a given period by the number of years in the period. If the mean annual increment is calculated for a portion of the total age, it is called the “periodic mean annual increment”; if for the total or final age of the tree or wood, it is called the “final mean annual increment.”

Increment (Volume) per cent.—The proportion which exists between the total volume of a tree or wood at a certain age and the increment added during the year before or the following year.

Indicating per cent (see “Forest per cent.”).

Indigenous.—A tree growing in its original habitat. (See “Habitat.”)

Intermediate Yield.—All material from thinnings or from any cutting not intended to invite or assist reproduction.

Intermittent Working.—When the final yield is obtained at irregular intervals.

Interrupt the Cover.—To form gaps and openings in the leaf canopy of a forest by the removal of trees constituting the crop.

Interrupted Leaf Canopy.—When the crowns of the trees are detached and isolated. (See “Canopy density,” “Park forest.”)

Irregular Crop.—A crop formed by trees of very various ages and sizes.

Isolate, To.—To place selected trees in a free position by removing all surrounding trees which threaten to interfere with them.

Kiln, Charcoal.—An oven for calcining wood so arranged as to permit of the regulation of the admission of atmospheric air.

Kiln Drying.—The drying of timber by treatment in a heated chamber whereby the time taken to season the timber is reduced.

Kiln, Seed.—A chamber used in order to separate seed from cones or pods by means of hot air.

Knottiness.—A defect in wood due to the abnormal direction of the fibres caused by branches which have been enclosed in the wood. (See "Gnarled.")

Latent Buds (see "Dormant Buds").

Leaf Litter.—That portion of the forest floor which is not in an advanced stage of decomposition. (See "Forest Floor.")

Leaf Mould.—That portion of the forest floor in which decomposition is well advanced. (See "Humus.")

Lift, To (a seedling).—To prize up seedlings in the seed bed, so that they may be pulled up for transplanting.

Light Demanding.—A species which thrives only under the influence of direct light.

Light Requirement.—The necessary amount of light for the most favourable development of a species. (See "Light demanding," "Shade bearing.")

Line out, To.—To transplant seedlings from the seed bed to rows in the forest nursery.

Location.—An area surveyed with a view to alienation for settlement by the Lands Department.

Lop and Top.—What is left of a tree after it has been converted into logs.

Lop, To.—To cut off one or more branches of a tree; the operation not being done for the benefit of the tree as in pruning.

Low Cover.—The shade afforded by small plants not being a portion of the forest crop, such as ferns, mosses, grasses, and weeds.

Lower Storey (see “Two-storeyed Forest”).

Major Produce.—Wood suitable for conversion into marketable timber.

Marking Trees for Fellings.—The branding on standing trees of a recognised sign denoting that they are for removal.

Marking Hammer.—An implement employed to brand on timber, standing or felled, a mark denoting treatment or ownership.

Mature Forest.—A forest in which the crop has reached the age of maturity. (See “Maturity.”)

Maturity—

1.—The age at which the tree, after its height has culminated, attains its maximum in girth measurement and begins to become unsound and to deteriorate.

2.—The age at which a tree becomes exploitable.

Mean Annual Increment (see “Increment, Mean Annual”).

Merchantable Length.—The total length of that portion of the stem which can be used under given conditions.

Merchantable Timber.—That portion of a tree which can be utilised as timber.

Merchantable Volume.—The total volume of that portion of the tree which can be used under given conditions.

Method by Area.—Basing the yield under a working plan on the area to be cut over periodically.

Method by Volume.—Basing the yield under a working plan on the periodic volumetric yield of the forest.

Method of Successive Regeneration Fellings.—In this method, instead of the entire crop being removed from the area exploited in a single operation, the re-

moval takes place gradually in successive fellings made from time to time as the new growth requires less and less shelter from the parent crop. In addition to this gradual exposure of the new growth, the young crop, as it grows up, is fostered by cleanings, thinnings, etc. The successive fellings, made in connection with this method, are called **preparatory**, **seed**, **secondary** and **final**. The first and second may be either **close** or **open**. This method is sometimes called "The shelter wood compartment system" or "high forest compartment system"; and sometimes the "uniform method." A forest treated by this method is sometimes called a "regular high forest."

Mid-Diameter or Girth.—The diameter or girth measured half-way along the length of a stem or log.

Minimum Girth.—A girth fixed by regulation or direction as being the minimum girth measurement of any tree of a given species, to be felled on a given area.

Minor Produce or Products.—All forest products except timber.

Mixed Crop or Forest or Wood.—A crop or forest composed of trees of two or more species intermixed. The various species composing a mixed forest may be distinguished into three several classes—**principal**, **auxiliary**, and **accessory**.

Money Yield Tables (see "Yield Tables, Money").

Mother-Tree.—A tree which provides the seed for natural reproduction.

Mound Planting.—A method of planting in which the seeds or young trees are planted on mounds, ridges, or hills.

Natural Pruning.—The clearing of the stem through the death and fall of side branches.

Natural Regeneration.—The renewal of a forest by self-sown seeds, or by stool or root shoots.

Net Yield.—The clear profit obtained from a forest after deducting all working expenses and interest charges.

Normal.—The word “normal” applied to increment, growing stock, and present and future yield signifies that which may reasonably be expected by correct management, taking into consideration the quality of the locality, as well as any extraordinary disturbances which may be foretold. (See “Forest, Normal.”)

Normal Forest.—When, in addition to being constituted of a complete series of growths of all ages from the seedling to the exploitable tree, each age-class occupying an equal area, a forest is completely stocked, and the growth is proportionate to the fertility of the soil.

A forest may be said to be fully stocked when the canopy is complete and the dominant trees have sufficient growing space. Thus in a normal forest—

- (1) The normal growing stock must be present.
- (2) There must be a normal distribution of age classes.
- (3) It must be putting on normal increment.

Normal Form Factor.—Form factors obtained by measuring the diameter (or girth) at a constant proportion of the height of a tree, say, $1/10$ th, $1/20$ th, etc. (See “Form Factor.”)

Normal Yield.—The yield which a normal forest can permanently give. (See “Normal Forest.”)

Notch Planting; or Notching.—A method of planting by which the plant, while it is still a small seedling and before it has developed side roots of any length, is placed into a notch made with a hatchet or spade.

Nurse.—A tree which fosters the growth of another in youth.

Nurse-Crop.—A crop of trees grown for the purpose of fostering the growth of others.

Ocular Estimates (of volume).—To determine the volume of standing trees by eye-estimate.

Open (applied to woods).—A term applied to woods in which the crowns of the trees do not interlace but

form an interrupted leafy canopy which only partially shelters the ground. (See "Canopy Density.")

Order of Felling.—The determination of the locality of the coupes in a forest for each year or given period.

Overstocked.—A wood so densely stocked as to prevent a sufficient development of the crowns of the individuals constituting the crop, i.e., containing more trees per unit of area than a normal forest of the same age.

Over-Mature—

1.—A tree or crop in which, as the result of age, growth has almost entirely ceased, and decay and deterioration have begun.

2.—A tree or crop which has passed the exploitable age or size.

Overwood (see "Two-storeyed Forest.")

Park Forest.—A forest in which there are appreciable gaps and openings between the trees and shade occurs only in isolated patches. (See "Canopy Density.")

Partial Sowing.—When sowing is restricted to a portion of the area to be stocked. (See "Sowing in strips, patches, holes, trenches, mounds.")

Period.—A sub-division of a rotation.

Periodic Section.—The part of a forest set aside to be treated during a period of the rotation.

Periodic Increment.—The increment added during a number of years or a period.

Periodic Mean Annual Increment.—When the mean annual increment is calculated for a portion of the total age. (See "Increment, Mean Annual.")

Permanent Nursery.—A nursery worked continuously for the supply of plants required year after year for extensive planting operations.

Physical Rotation.—That age which is most favourable for the natural regeneration of a species, taking into consideration the conditions of the locality and the

sylvicultural system. In the case of protection forests, parks, etc., the physical rotation may be taken as that which coincides with the natural lease of life of the trees.

Pit Planting or Sowing.—A method of placing seeds or seedlings in excavations, which may be either narrow pits with steep sides, or shallow sloping hollows.

Plan of Operations.—A table showing under the various heads of forest management the order and nature of the operations to be carried out during one or more years. Such plans are based on the provisions of a regular working-plan where these exist, otherwise on general sylvicultural principles.

Planting.—The method of forming a wood by means of plants which have been raised elsewhere.

Planting-Plan.—A detailed scheme for forest planting on a given area.

Pollard.—A tree whose crown has been cut back to invite the production of shoots.

Pollard, To.—To invite the production of shoots at the top of the tree by cutting back the crown. The crown may be removed either leaving the main stem intact, or cutting it off at a certain height from the ground. In the latter case the system is frequently called topping.

Possibility.—Theoretically the possibility is the productive power of a wooded area expressed in quantity of material. Practically it is taken to mean the quantity of material which, without infringing the rules of forestry, may be felled in a forest, annually or periodically for the time being. The possibility may be applied either by area, by number of trees, or by volume.

Possibility, Fixing the (see the "Determination of the yield.").

Possibility, Actual or Present.—The annual yield in material which a forest is capable of giving under existing physical, legal, and other conditions affecting it.

Potential Possibility.—The annual yield in material of which a forest is capable when maintained at its highest possible limit of productiveness.

Preliminary Examination (of a forest).—A reconnaissance of a forest in order to gain a general knowledge of all facts likely to be useful in determining the future plan of management.

Preparatory Fellings (see "Method of successive regeneration fellings.").

Prick out, To.—To transplant small seedlings in a nursery.

Principal Fellings.—The methodical removal of exploitable trees according to a pre-arranged plan. (See "Final yield.").

Principal Produce.—The material for the production of which a forest is primarily maintained.

Principal Species.—That kind of trees to produce which the management of a forest is primarily designed. (See "Mixed Crop.").

Private Forest.—A forest which is not the property of a State or Government.

Produce, Minor.—All forest products except timber and fuel such as firewood, grass, honey, gums, etc.

Protection Forest.—A forest whose chief value is to regulate stream flow, prevent erosion, hold shifting sand, or exert any other beneficial effect on the adjacent country.

Protective Belt.—A forest which is maintained as a protection against wind, snow, or other forces.

Prune, To.—To remove superfluous branches for the benefit of the tree.

Puddle, To.—To dip the roots of young trees in thin mud.

Pure Crop, or Forest or Wood.—A crop formed of a single species.

Quality Increment.—The increase in the value per unit of volume, independently of any alteration in the general price of forest produce.

Quality of Locality.—The nature of the soil and climate, the latter being governed by the situation. The sum total of these factors represents the **quality** or **yield capacity** of the locality.

Quarter Girth Measure.—The calculation of the volume of round timber on the assumption that the sectional area is equal to the square of a quarter of the girth.

Range.—A defined area to which a specified officer's activities are confined.

Raw Humus.—An accumulation of leaves, needles, weeds, and moss which has remained undecomposed.

Reforestation.—To re-establish forest growth either by natural or artificial means.

Regenerate.—To renew a forest crop by natural or artificial means.

Regeneration Cleaning.—Operations subsequent to the removal of major forest produce carried out with the object of providing suitable conditions for regeneration.

Regeneration Felling.—The removal of exploitable trees with the view of inviting or assisting natural reproduction. Method of successive regeneration fellings.

Regeneration Operations.—All cutting and subsequent operations (known as regeneration cleaning) necessary to provide for the successful growth of a desired species on a particular area.

Regeneration Period.—The space of time required for the renewal of the growing stock, being the number of years elapsing between the commencement of cutting operations and the establishment of a new crop on any coupe.

Rental Value (of a forest).—The capital sum which would yield a rental equal to that which a forest is capable of yielding.

Re-stock.—To renew a forest either by natural or artificial means.

- Rhizome.**—The underground stem of bamboos or fern.
- Ridge Planting.**—A method of planting on wet ground, in which the young trees are planted on ridges.
- Right** (see “Servitude”).
- Ring-shakes** (see “Cup-shakes”).
- Ring, To, or Ringbark.**—To kill a standing tree by making a circular incision through the bark. (See “Sap-ring, To.”)
- Rock.**—The geological formation underlying the soil which affects the forest by its outcrop, composition, the rapidity of its disintegration, etc.
- Rotation.**—The number of years determined on between the regeneration of the forest crop and its arrival at exploitable age. The following classes of rotation are distinguished (q.v.) :—
- Financial rotation.**
 - Physical rotation.**
 - Rotation of the highest income.**
 - Rotation of the greatest volume production.**
 - Technical rotation.**
- Rotation of the Greatest Volume Production.**—The rotation under which a forest yields the greatest quantity of material per unit of area; its length coincides with the year in which the mean annual volume increment culminates.
- Rotation of the Highest Income.**—The rotation which yields the highest income, calculated without interest and irrespective of the time when the items of income occur.
- Sale Value.**—The price which can be realised by the sale of property.
- Sample Area or Plot.**—An area of known size selected with the object of testing a specified system of treatment either qualitatively or quantitatively.
- Sample Tree.**—A tree which is representative of a certain class.

Sand Dune (see "Dunes").

Sapling.—Young tree developed from seed, over 5ft. in height and less than 5in. B.H. diameter.

Sap-ring, To.—To kill a standing tree by making a circular incision through the bark and sapwood. (See "Ringbark.")

Sapwood.—The outer and younger zones of wood, usually pale-coloured, surrounding the heartwood. (Syn. "Alburnum.")

Scrub.—Inferior forest growth consisting chiefly of small or stunted trees and shrubs.

Seasoning.—To prepare for use by drying or hardening.

Second Growth.—Forest growth which comes up naturally after felling, fire, or other disturbing cause.

Seed Bearer.—A tree suitable for providing seed for natural regeneration.

Seed Bed.—A soil surface specially prepared to encourage germination and the development of seedlings.

Seed Kiln (see "Kiln, Seed").

Seed Year.—A year in which a given species bears seed abundantly.

Seedling.—A young plant which results directly from the germination of a seed and is under 5 feet in height.

Seedling Forest, or High Forest.—A crop composed of trees which have sprung from seed.

Seedling Plants.—Seedlings which are taken direct from the seed bed to the forest.

Seedling Tree.—A tree of any age sprung from seed and not from a coppice shoot.

Selection Felling.—The methodical removal of the exploitable trees in a forest, either singly or in groups, with a view to producing from self-sown seedlings a new crop irregular in its constitution.

Selection Forest.—A forest so managed that trees of all ages are distributed over its whole area.

Selection System.—Removing in a methodical manner, in accordance with silvicultural requirements so as not

to exceed the possibility, the exploitable trees in a forest by felling them here and there, either singly or in groups.

Self-sown Seed.—Seed sown by any agency other than man.

Servitude.—A claim possessed by a person, community, or property to diminish the full enjoyment of the property of another.

Severance Felling.—A cleared strip of varying breadth, by which two woods are separated in the general direction of the cuttings, at a place where some time after regular fellings are to commence.

Shade Bearer or Bearing.—A species which tolerates the cover of other trees.

Shakes.—Faults in timber (of the nature of cracks) due to excessive age, cold, frosts, sudden changes of temperature, sunstroke, or to a too dry or too wet condition of soil. (See "Cup-shakes"; "Heart-shakes"; "Star-shakes.")

Shallow Rooting.—When the root system does not extend far below the surface of the ground.

Shoot.—A young branch or growth.

Shrub.—A small woody plant which branches at or near the ground.

Slab.—The outermost pieces of timber trimmed off a log during conversion. (Syn. face cut.)

Slope.—The gradient of the surface of the ground. The following terms are used in forest description to define the slope:—

Level	0 to 5%	=	0° to 3.0°
Gentle	5 to 15%	=	3.0° to 8.5°
Moderate	15 to 30%	=	8.5° to 16.5°
Steep	30 to 50%	=	16.5° to 26.5°
Very Steep .. .	50 to 100%	=	26.5° to 45.0°
Precipitous .. .	Over 100%	=	Over 45.0°

Snag.—An uprooted tree resting in the bed of a stream.

Softwood.—

(1) A timber requiring a load less than 1,000lbs. to the square inch to produce an indentation of one-twentieth of an inch.

(2) A term loosely used to refer to timber of Gymnosperms or cane-bearing trees, the majority of which belong to this class.

Sowing in Situ.—The sowing of seed in places where the resulting trees are intended to remain. (See "Direct Sowing.")

Sour Humus (see "Acid Humus").

Sporadic Flowering.—Flowering which is confined to individuals and does not extend to every one of a particular species (cf. gregarious flowering).

Stand or Stand of Trees.—The trees on an area of land, exclusive of the land itself.

Standard.—The trees permitted to remain after a felling with the object of producing trees of larger size.

Standard Girth.—A girth measurement fixed for exploitation purposes as the girth at which trees should be felled to best realise the objects of management.

Star-shakes.—Faults in timber due to excessive age, or to a too dry or too wet condition of soil. (See "Shakes.")

Stem.—The trunk of a tree from the ground to the point where its main branches are given off. (See "Bole.")

Stem Analysis.—The investigation of the progress of increment throughout the life of a tree.

Stem Fire.—A fire which ignites the stems of the trees. (See "Forest Fire.")

Stiff (of a soil).—A soil which is cohesive and tenacious.

Stock; or Growing Stock.—The entire collection of trees growing on a given area. (See "Crop.")

Stock, To.—To cover with forest growth.

Stock Map.—A graphic representation of the manner in which the forest stock, species, and age classes are distributed over the forest area.

- Stool.**—The lowest part of the stem of a tree, together with the roots, left when a tree has been felled close to the ground. (See “Stump.”)
- Stool-Shoot.**—A stem springing from the stool or stump of a felled tree. (See “Coppice.”)
- Storeyed Forest** (see “Forest in storey”).
- Strip method of successive regeneration Fellings.**—When regeneration fellings are made in narrow strips. (See “Method of successive regeneration Fellings.”)
- Storeyed Forest Method.**—The forming of a crop of stems of different ages the crowns of which are arranged in tiers, the difference in age between the trees of each consecutive tier being equal to the length of the felling rotation. The method differs from that of coppice with standards, because regeneration is obtained principally by seed instead of by stool-shoots.
- Strip Sowing** (see “Sowing in Strips”).
- Stump.**—That portion of the stem below the cut made in felling a tree.
- Sub-compartment.**—A sub-division of a compartment, permanent or temporary.
- Subsoil.**—The stratum of earth lying between the upper soil and the rocks.
- Sucker.**—An aerial shoot sprung from a root.
- Suppressed Tree.**—A tree of which the growth has practically ceased as the result of too much overhead cover. (See “Crown.”)
- Surface Feeder.**—A species of which the roots spread near the surface.
- Surface Fire.**—A forest fire which runs over the undergrowth. (See “Forest Fire.”)
- Sustained Working.**—A forest so worked that the soil continuously produces undiminished crops of wood exploitable at fixed periods.
- Sustained Yield.**—The forest produce yielded by sustained working.

Sylvicultural System.—A method according to which the formation, regeneration, tending, and exploitation of the woods which compose a forest is effected.

Sylviculture.—The formation, regeneration, and tending of forests.

Technical Rotation.—The rotation under which a forest yields the most suitable material for a certain fixed purpose.

Temporary Nursery.—A nursery which is used for a few years only, generally to yield the material for the planting of a particular locality, after which it is abandoned and a new nursery laid out elsewhere. (See "Forest Nursery.")

Tending (of a wood).—Includes the preservation of the factors of the locality by maintaining both suitable overhead and soil covering; the protection of the crop against external dangers; the preservation of the proper density of the crop and of a proper mixture of species; cleaning, pruning, thinning, and other operations for the benefit of the stock.

Thin Canopy.—When half to three-fourths of ground is shaded.

Thinnings.—The removal of excess stems from a crop with the object of diminishing adverse competition and affording more light and space.

Light Thinning.—Dead and suppressed trees only are removed.

Moderate (Medium) Thinning.—Dead, suppressed, and a proportion of the dominated trees are removed.

Heavy (Crown) Thinning.—Certain dominant trees are removed and a number of dominated and suppressed trees may be left to cover the soil until the main canopy closes up.

Tidal Forests.—Forests whose existence or condition is referable to the influence of the tides.

Timber.—Wood above a certain minimum diameter or girth. For statistical purposes a minimum girth of two decimeters (7·874 inches) is taken in Europe.

Timber Survey.—Any operations which have for their object the estimation of the amount of timber or number of trees per unit of area.

Transplant, To.—Planting out transplants in the forest.

Transplants.—Seedlings which have been moved once or oftener in the nursery lines.

Trap Tree.—Dead or girdled standing trees or logs left in a forest to attract insects, in order to lead the pests from the valuable tree crop and enable them to be destroyed.

Tree.—

1.—A large woody plant which at some distance from the ground produces branches.

2.—The separate individuals of a crop are termed “trees” from the time of attaining normal height.

3.—Under Forest Acts a “tree” includes not only timber trees, but trees, shrubs, and bushes, seedlings, saplings, and re-shoots of all kinds and of all ages.

Undergrowth.—Plants of limited height growth compared with a main crop of trees growing over them.

Underplanting.—To plant young trees under an existing older crop.

Underwood, or Understorey.—The young tree growth springing up under the reserve trees.

Uneven-aged Crop.—A crop of trees made up of many different age classes.

Uniform Crop.—A crop of trees approximately all of one age or size.

Unregulated Fellings.—Removal of trees, exploitable or not, and uncontrolled by any silvicultural method.

Utilisation Value (of growing stock).—The price which a wood would realise if offered for sale in the open market. (See “Sale Value.”)

Valuation Survey.—The determination or estimation of the value of the growing stock.

Virgin Forest.—A natural forest uninfluenced by man.

Volume Table.—A tabular statement giving for a forest the volumes of the type trees of the different diameter classes.

Wanes.—The rounded corners of an incompletely squared balk.

Waste Land.—Land which is not used for any specific purposes.

Wind Belt.—A natural or artificial forest maintained as a protection against wind.

Windfall.—A tree thrown by wind.

Windfirm.—Able to withstand strong winds.

Working Circle (or Circle).—A forest controlled by one and the same Working Plan.

Working Plan.—Any scheme of management aiming at a continuity of policy controlling the treatment of a forest.

Working Plan Report.—A written statement embodying Working Plan proposals.

Working Plan Survey.—Any operations which have for their object the collection of data on which a Working Plan is to be based.

Wounding (of the soil).—The superficial loosening of the soil with the rake, harrow, hoe, or by other mechanical means, as a preparation for broadcast sowing, or to encourage natural regeneration by seed.

Yield.—The total volume or quantity of all produce whether removed, utilised, or not.

Yield Table.—A tabular statement which gives the course of the development of a wood from early youth up to a certain age, either from year to year, or for intervals of a certain number of years.

Yield Table, Money.—A tabular statement which gives the course of the development of the money value of a wood from early youth up to a certain age, either from year to year, or for intervals of a certain number of years.