

Glossary

Accession	Entry in a gene bank collection; accessible sample in a gene bank
Adaptation	Any change in an organism's structure or function that allows it to better cope with conditions in the environment. Adaptation can be achieved as pure phenotype or as genotype adaptation, the latter leading to inherited value or fitness in a certain environment ¹
Additive factors	See additive genes
Additive genes	Genes interacting and showing no dominance (if alleles) or showing no epistasis (if non-alleles) ¹
Allele	Any of the different forms of a gene occupying the same locus on homologous chromosomes, and which undergo meiotic pairing and can mutate one to another. Often a gene consists of more than two alleles (allelic series) ²
Allogamous	Cross-fertilising
Allotetraploid	Hybrid polyploid derived by the doubling of the chromosome complement of a diploid hybrid ²
Amphidiploid	A polyploid formed of hybrid diploid parents by doubling of the chromosome set. The diploid hybrids from which amphidiploids originate are generally sterile owing to the significant non-homology between the chromosome sets and the consequent difficulty of chromosome pairing during meiosis. With the doubling of the chromosome the sterility barrier is removed. Amphidiploids commonly possess better viability and competitive ability than the original species and the diploid hybrid ¹
Androecious	Of plants having only male flowers ¹
Androgenesis	Development of a haploid embryo from a male nucleus, e.g. by the germination of a pollen grain within an anther ^{1,2}
Annual	Having a yearly periodicity; living for one year ²
Anther	The part of the stamen in which the pollen grains are produced ²

Apomixis	Reproduction without fertilisation, in which meiosis and fusion of gametes are partially or totally repressed. The embryo generally has the same chromosome number and the same genotype as the mother individual ^{1,2}
Arable	Suitable for plant cultivation
Autogamous	Self-fertilising or self-pollinating
Bank	See gene bank
Basic seed	See foundation seed
Biotype	A group of genetically identical individuals
Bolting	Flower and seed stalk formation
Bract	See sepal
Bran	See pericarp
Breeder seed	Seed population, true to type and uniform, based on individual plant selections and representing the genuine variety characteristics
Budding	Forming leaf or flower buds
Bulk harvesting	See bulking
Bulking	Harvesting, with or without mass selection, of seed from a given population of a self-pollinated crop, followed by single plant selection ³
Callose	Sediment of carbohydrate composition in vascular tissue. Callose has strong light refraction
Canopy	The uppermost continuous layer of foliage in the vegetation of a crop (after note 2).
Carpel	Fruit wall segment
Castration	Removal of sexual parts of the flower
Centre of diversity	Geographic area where the greatest genetic diversity of a crop is found. This area may, or may not, coincide with the centre of origin
Centre of origin	Geographic area (according to the theory of Vavilov) where the greatest genetic diversity of a crop or species is originally found
Certified seed	Officially approved commercial seed, true to type and sufficiently pure for agricultural use
Chloroplast	Cell organelle limited by a double membrane and containing chlorophyll; a lamellar structure in a protein-rich ground substance, containing a minor portion of the plant genome ¹
Chlorosis	Deficiency in the synthesis of the green substance in the leaves, chlorophyll, the site of photosynthesis

Chromosome	Nuclear body composed largely of DNA and protein, and comprising a linear sequence of genes ² ; chromosomes transmit genetic information from cell to cell and from generation to generation; they release information to control cellular functions. Chromosomes are self-reduplicating structures. In diploid plants each chromosome has a structurally similar, homologous partner
Clone	Assemblage of organisms derived by vegetative multiplication from a single (sexually derived) individual ² . Individual plants of a clone are genetically identical
CMS	See cytoplasmic male sterility
Contamination	<ol style="list-style-type: none"> 1. Introduction of an undesirable agent such as a pest or pathogen into a previously uninfested/uninfected situation² 2. Genetic impurity of a population by involuntary cross-pollination with alien pollen grains
Corolla	Petals and sepals
Cotyledon	First leaf or leaves appearing on seedling after germination
Crop	A domesticated species or subspecies grown for agricultural purposes
Cross-fertilisation	The union of male and female gametes from different individuals of the same species
Cross-pollination	Transfer of pollen from a flower of one plant or population to the stigma of a flower on another plant or population (after note 2)
Culm	Stem of a grain crop
Cultigen	<ol style="list-style-type: none"> 1. See cultivar, variety 2. A group of varieties and various types of lines, such as breeding lines, mutants or marker lines, of cultivated crop species⁴
Cultivar	See variety
Cybrid	The fusion product of a cytoplasm from which the nucleus has been removed with an intact, nucleus-containing cell ¹
Cytoplasm	See protoplast
Cytoplasmic male sterility	Maternally inherited inability of a higher plant to produce viable pollen
Dehiscence	Spontaneous opening of ripe plant structures to liberate seeds and spores ² as well as pollen
Dihaploid	<ol style="list-style-type: none"> 1. Individual produced from a tetraploid form which possesses half the tetraploid number of chromosomes¹ 2. Individual produced by doubling the number of chromosomes from a haploid individual. In this case dihaploids are completely homozygous.

Diploid	Carrying a double set of homologous chromosomes, typical of most organisms derived from fertilised egg cells ($2n$ or $2x$) ²
Domestication	Adaptation of plants for life in intimate association with man ² , adaptation of wild plants to cultivation by man
Domir.ant	Expression of a gene into a character for which the corresponding alleles are manifest in both homozygous and heterozygous conditions (after note 1)
Dormancy	State in which viable seeds fail to germinate under conditions favourable for germination and vegetative growth ²
Drift	See genetic drift
Ear	Female inflorescence of maize and grains
Ecotype	Locally adapted population; a race or intraspecific group having distinctive characters which result from the selective pressures of the local environment ²
Egg cell	The fertile haploid cell in the embryo mother cell that develops into the diploid embryo after fertilisation
Emasculation	Removal of anthers
Emergence	Capacity to germinate in a farmer's field
Endemic	Native to, and restricted to, a particular geographical region ²
Endosperm	Part of the egg cell that develops into nutrition tissue, distinct from the embryonic tissue
Epidemic	High degree of diffusion of disease in a plant population
Exotic	<ol style="list-style-type: none"> 1. Organism coming from a non-related species 2. A non-indigenous plant
Family	<ol style="list-style-type: none"> 1. Selected group of basic seed populations or selected pollen producing populations in a cross-pollinating species 2. A group of genera phylogenetically related
Female-sterile	Unable to produce viable ovules or seed
Fertilisation	The union of a male and female gamete to form a zygote ²
Field emergence	See emergence
Filament	Part of male flower supporting the anther
Fixed	Homozygosity of genes having favourable pleiotropic effects; the attainment of homozygosity in a population which thereby becomes monomorphic with respect to a given allele ² ; genetically uniform
Flower initial	The cell division area from which flower bud formation begins
Fodder crop	See forage crop
Forage crop	Animal feed producing crop

Foundation seed	Seed population grown from breeder seed, of guaranteed identity, genetic purity and homogeneity, suitable for multiplication to registered seed
Free-threshing	Seed hull detaches from seed when dry
F ₁ -hybrid	See hybrid
Gamete	Mature reproductive cell, usually haploid, serving in fertilisation (after note 2)
Gametophyte	Plant stage in haploid sexual generation which produces the gametes ¹
Gene bank	Internationally recognised collection of wild materials, landraces, cultivars, mutants, research materials and breeding lines
Gene pool	The total genetic material of a freely interbreeding population at a given time ²
Genetic drift	Occurrence of random changes in the gene frequencies of small isolated populations, not due to selection, mutation or immigration
Genetic marker	Any allele used as an experimental probe to identify a nucleus, chromosome, or gene ¹
Genetic variation	That part of phenotypic variance of individuals in a population produced by differences or changes in genetic constitution such as mutation or recombination ²
Genome	The basic (monoploid) set of chromosomes of a particular species minimally required for the proper functioning of a cell (after note 2)
Genotype	Sum total of the genetic information contained in the plant DNA. The genotype determines not a unique phenotype, but a range of phenotypic capacities referred to as an individual's "norm of reaction" to the environment ¹
Genus	Taxonomic rank between family and species; classification comprising one or more phylogenetically related and morphologically similar species ²
Germ	Inside part of the seed; embryo and endosperm
Germplasm	The hereditary material transmitted to the offspring via the gametes
Haploid	Carrying only one set of chromosomes (n or x). Haploid plants are unstable, weak and sterile. Normally they do not occur in nature
Herbaceous	Non-woody
Hermaphrodite	Separate male and female organs in one organism (flower, plant)
Heterogeneous	A breeding population in which the majority of genes are heterozygous

Heterozygote	Plant with a heterozygous gene pair
Heterozygous	Having two different alleles at a given locus of a chromosome pair ²
Hilum	Navel
Homogeneous	A breeding population in which the majority of genes are homozygous
Homozygous	Having two identical alleles at a given locus of a chromosome pair ²
Horizontal resistance	Resistance depending on many genes, each of which is of low effectiveness
Hulled	Seed to which the seed hull remains attached when seed has dried
Husks	Foliage surrounding the inflorescences or seeds
Hybrid	<ol style="list-style-type: none"> 1. Variety of which the seed is obtained by multiplying the seed of one basic seed population – the female parent line – and restricting pollination to one other basic seed population – the male parent line. Both female and male parent lines are usually obtained by continued self-fertilisation, or inbreeding. 2. Offspring of a cross between genetically dissimilar individuals²
Hybridisation	The process of crossing two dissimilar plants
Hybrid variety	See hybrid
Hypocotyl	The stem part under the cotyledon of the seedling
Inbreeding	Continued self-fertilisation over several generations; mating of individuals more closely related than average pairs in the population ²
Infection	Invasion of a host by a parasite or pathogenic microorganism ²
Infestation	Invasion by parasites or pests ²
Inflorescence	The grouping of flowers in a special plant organ
Inoculation	Administering inoculum to a plant or to a plant population
Inoculum	Individual or (concentrated) group of individuals comprising the founders of a colony or a newly established (usually pathogenic) population ²
Insect vectors	Insects transmitting disease from one organism to another
Introgression	Spread of genes of one species into the gene pool of another by hybridisation and backcrossing ²
Karyology	The branch of cytology dealing with the study of nuclei, especially the structure of chromosomes ²
Landrace	(Formerly) cultivated population maintained by farmers without methodological selection

Legume	All pea and bean crops, pulses, belonging to the Leguminosae
Linkage	Presence of specific genes on the same chromosome located so closely that the traits are not independently assorted. The greater the proximity of these genes, the lesser the chance of their separation by crossing over (when gametes are formed) and the stronger the linkage ²
Locus	The site on the chromosome where a gene is located
Lodging	Inability to stay upright; bending and falling down of culms (stems)
Maintainer line	Pollen parent line carrying restorer gene(s)
Male-sterile	Unable to produce viable pollen grains
Maternal haploid	Individual with a single genome or chromosome set, entirely derived from one mother plant
Meiosis	Reduction division, consisting of two successive divisions of a diploid nucleus, resulting in the formation of the haploid gametes, each of which contains one of each pair of the homologous chromosomes of the parent cell ²
Micro-mutation	Mutation within a single gene ² , causing a minor effect
Mitochondria	Semi-autonomous higher plant cell organelles having their own genetic system encoded in mitochondrial DNA ¹ , a minor portion of the genome. They are maternally inherited. Malfunction of mitochondria is probably a general cause of CMS ¹ . See pollen restoration
Monoecious	Having complete male flowers and complete female flowers growing on the same plant
Monogenic	Trait depending on only one gene
Multifoliate leaf	Leaf composed of many small leaflets
Mutagenesis	Purposely directed destabilisation of the genome in order to cause mutation
Mutant	Any organism, gene, or character that has undergone a mutational change ²
Mutation	A sudden heritable change in the genetic material, most often an alteration of a single gene by duplication, replacement or deletion of a number of DNA base pairs ²
Necrosis	Death of plant tissue
NMS	Nuclear male sterility
Nucleus	Cell organelle enclosed in a membrane containing the bulk of the individual's genetic information ¹
Oligogenic	Trait depending on a small number of genes
Onion set	Small onions grown from seed for transplanting and production of large bulbs
Organelle	Part of a plant organ

Ovary	Organ containing the ovule
Ovule	The flower organ producing the seed. It includes the nucellus and the integuments ¹
Paddy	Rice
Panicle	Inflorescence of rice, oat, sorghum
Parthenogenesis	Induction of an embryo in an unfertilised egg-cell ¹
Partial resistance	A situation in which a pathogen only affects the plant to a certain extent
Pathogen	Microorganism causing disease
Pedigree seed	See breeder seed
Perennial	Plant that persist for several years with a period of growth each year ²
Pericarp	Outside skin of the seed; tissue originating from the mother plant, not from the fertilised ovule
Petal	The inner circle of flower leaves, usually coloured, surrounding the sexual flower organs
Petalloid anthers	Anthers transformed into petals
Petiolate leaf	Leaf with stem
Phenotype	The product of the interaction between the genotype and the environment – the observable structural and functional properties of an organism ²
Photoperiod	Day length
Photosynthesis	The biochemical process that uses radiant energy from sunlight to synthesise carbohydrates from carbon dioxide and water in the presence of chlorophyll ² , releasing oxygen to the atmosphere
Pistil	Entire female part of the flower
Plant species	See species
Plant variety	See variety
Ploidy	Number of sets of chromosomes
Pollen	The sum of all pollen grains
Pollen grain	One of four haploid microspores formed in the anther by a pollen mother cell, which germinates to form the male gametophyte (after note 1)
Pollen restoration	Return of male fertility to a cytoplasmic male-sterile plant by a nuclear restorer gene able to override the effects of the cytoplasm, or cytoplasmic reversion to male fertility ¹
Pollen tube	Tube growing from a germinating pollen grain into the stigma, style and ovary of a flower. The pollen tube carries the male gametes

Pollination	The transfer of pollen from the anther to the receptive area of a flower, used loosely to mean fertilisation of a seed plant ²
Polygenic	Trait controlled by the integrated action of multiple independent genes ²
Polymorphous	Having several different simultaneous forms; polymorphism is supposed to be a self-regulatory phenomenon in population behaviour
Propagation	Multiplication
Propagule	Any individualised plant tissue able to grow out and produce a complete new plant ²
Protoplast	Plant cell after removal of cell wall ¹
Race	An intraspecific category characterised by conspicuous physiological, biological, geographical or ecological properties ²
Ratoon crop	A crop of which the above-ground parts have been harvested and the ground part is allowed to sprout again from auxiliary buds on basal nodes or crown to produce another crop ⁴
Recalcitrant	<ol style="list-style-type: none"> 1. (of tissue) tissue resisting genetic modification 2. (of seed) having short longevity, even under artificial favourable influences
Recessive	An allele that is not expressed in the phenotype except when homozygous ²
Registered seed	Officially approved commercial seed of excellent purity and trueness to type, suited for one, sometimes two further commercial multiplications to certified seed. Registration is made by seed officials or by the producer under licence from the seed office
Resistance	Ability of a plant to cope with attacks by pathogenic organisms, pests or adverse physical conditions, thereby reducing the effect of the attack
Restorer gene	See pollen restoration
Rogueing	Elimination of off-type plants
Scion	Part or structure transplanted from one plant to another during a graft ²
Sclerenchyma tissue	Hard-walled plant tissue
Seed-borne	Carried by or in the seed
Seed-head	Inflorescence
Seed stock	A certain quantity of qualified seed
Seed-transmitted	See seed-borne

Segregation	The process in sexual organisms by which the two members of an allele pair, or a pair of homologous chromosomes, separate during gamete formation, with each gamete receiving only one member of the pair ²
Select seed	First multiplication of breeder seed following severe individual plant selection
Self-fertilisation	The union of pollen grains of a plant with the ovules of the same plant
Self-pollination	Transfer of pollen from anthers to stigma of the same flower or to another flower on the same plant ²
Semi-dominant	Having alleles that are neither completely dominant nor completely recessive so that each is expressed to some extent in the heterozygote ²
Sepal	The usually green outer circle of flower leaves surrounding the sexual flower organs
Serological test	Disease test using antigens and antibodies
Sessile leaf	Leaf without stem
Set	See onion set
Shattering	Natural detachment of the seed from the fruit or inflorescence at maturity
Short day species	Species dependent on the decline of the photoperiod to trigger the process of flower initiation and flowering. Dependence may vary by variety or group of varieties
Sib pollination	<ol style="list-style-type: none"> 1. Pollination of one plant by another plant derived from the same parents² 2. Selection method whereby one basic seed population (family) is outcrossed to many pollen parents (half-sib) or to only one pollen parent (full-sib)
Silique	Seed pod of <i>Cruciferae</i>
Silk	Bundle of styles extending from a maize ear
Sink	Physiological term for a process or a plant part serving as a reservoir capable of absorbing or receiving energy or matter without undergoing significant change
Stamen	Anthers and their support organ
Somatic cell	Any non-reproductive cell
Somatic embryogenesis	The production of embryo-like structures (embryoids) from somatic cells of the plant (as opposed to germ cells) ¹
Somatic hybrid	A plant originating from cell protoplast fusion
Species	A taxon ranking in the hierarchy of biological classification as the category below genus. The species is the basic unit of biological classification ² . Plants within the species limit normally pollinate, fertilise and set seed naturally, unless selected for a form of sterility

Spikelet	Individual part of rice inflorescence
Sporophyte	The diploid, spore producing, asexual generation in the life cycle of a plant ²
Starting propagule	See propagule
Sterile	Unable to reproduce
Stigma	Receptive part of the female flower organ
Stomata	Pores in the leaves of all plants that regulate gas exchange between the inside of the leaf and the environment
Strain	Selected type of a cultivar; subvariety; a group of similar individuals within a variety ³
Stubble	Plant parts remaining in the soil after cutting or mowing the above-ground parts of a crop
Style	Flower organ connecting ovary and stigma
Subgenus	A section within a genus
Subspecies	A section within a species
Sucker	Vegetatively developing branch of a tree
Synthetic variety	A variety the seed of which is composed by bulk harvesting a mixture of two or more basic seed populations or families, each population being stabilised for its main characteristics, and tested for combining ability with the other basic population(s)
Tassel	Male inflorescence of maize
Taxon	A taxonomic group of any rank, including all the subordinate groups ²
Taxonomy	Scientific classification of plants, including systematic description and naming ² . In addition to morphological classification, gene identification has become an important taxonomic tool
Tillage	Mechanical preparation of the soil to enhance growth of cultivated plants
Tolerance	The range of an environmental factor within which an organism or population can survive ² . The same applies to pathogens and pests. The tolerant plant will not alter or change the attacking pathogen, pests or adverse environmental conditions
Trait	Hereditary characteristic
Translocation	Movement of a segment of a chromosome to another part of the same chromosome or to a different chromosome ²
Tri-, tetra-, hexa-, octa-, polyploid	Carrying respectively, 3, 4, 6, 8 or many sets of chromosomes
True breeding	Homozygosity of a plant or homogeneity of a plant population

Unreduced gamete	A complete chromosome (2n) taking part in fertilisation. Two unreduced diploid gametes give rise to a tetraploid plant.
Variety	A subgroup of a plant species, prepared for use in agriculture, sufficiently homogeneous and stable in its hereditary characteristics and distinct from other varieties; cultivar; cultigen
Vernalisation	Cold treatment for plants to enhance their natural need of cold in order to initiate flower formation
Vertical resistance	Resistance depending on one major gene
Winter nursery	Experimental garden in a mild climatic area allowing for cultivation and seed harvest in a counter-season in order to gain a breeding generation
Zygomorphous	Symmetric flower pattern
Zygote	Cell formed by the union of two gametes, and the individual developing from this cell ³

Notes and References

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