Glossary (A - K)

Plant Breeding Methods (CS, GN, HS 741)

ACQUIRED CHARACTER
: Modification impressed on an organism by environmental influences during development.

ADAPTATION
: The process by which individuals (or parts of individuals), populations, or species change in form or function in such a way to better survive under given environmental conditions. Also the result of this process.

ADDITIVE GENETIC VARIANCE
: That genetic variation (variance) which is due to additive effects of genes.

ADVANCED GENERATIONS SYNTHETIC VARIETIES (beyond Syn-1)
: Advanced generations derived from an initial intercrossing of a specific set of clones or seed-propagated lines; usually stable for only limited number of generations. Examples: `Ranger' and Moapa alfalfa, `Saratoga' bromegrass, `Pennlate' orchardgrass

AGAMEON
: A species that contains only apomictic individuals.

ALLELE = ALLEL, ALLELIC, ALLELOMORPH, ALLELOMORPHIC.
: One of a pair or a series of factors that occur at the same locus on homologous chromosomes and is inherited in alternative pairs for this reason; one alternative form of a gene.

ALLOPLOIDION
: A species derived from allopolyploidy; individuals are usually highly variable and apomixis is not present.

ALLOPOLYPLOID
: Polyploid having chromosome sets from different sources such as different species; a polyploid that contains genetically different chromosome sets e.g., from two or more species.

AMPHIDIPLOID
: Plant possessing the somatic chromosomes of two species; the latter is definitely known in the case of an amphidiploid but not in that of an allopolyploid.

AMPHIHAPLOID
: Plant having a haploid (1n) set of chromosomes from each parent of an interspecific hybrid, thus being (2x) rather than (4x), as in the case of an amphidiploid.

AMPHIPOLYPLOID
: Polyploid that arises by the addition of the complete somatic chromosome sets of two or more known species.

ANDROECIOUS
: A plant having staminate flowers (sometimes called all-male). SEE andromonoecious, dioecious, gynoecious, gynomonoecious, hermaphroditic, monoecious, trimonoecious.

ANDROGENETIC HAPLOID
: Plant having chromosomes from the male parent only.

ANDROMONOECIOUS
: A plant having staminate and perfect flowers. SEE androecious, dioecious, gynoecious, gynomonoecious, hermaphroditic, monoecious, trimonoecious.

ANEUPLOID
: Organism or cell having a chromosome number other than an exact multiple of the monoploid or basic number; hyperploid = higher, hypoploid = lower = nullisome.

ANGIOSPERMS (Angiospermae)
: Flowering plants characterized by the presence of vessels (lacking in a few families) in the wood, ovules enclosed in a megasporophyll (ovary), microsporangia (anthers) borne on a microsporophyll (filament), and a perianth of sepals and petals, either or both of which may be absent. Two major subdivisions are dicotyledons and monocotyledons.

ANISOGAMETE, ANISOGAMETIC
: A gamete of either of two kinds sexually differentiated in size or structure; the condition in which two such kinds of gametes are present.

ANISOGAMOUS
: Gametes of unequal size.

ANISOGENY
: Production of ovules and pollen that exhibit a consistent difference in genetic constitution,

ANISOPLOID
: Unequal ploidy levels (e.g., 2x and 4x) among progeny of a polyploid cross.

APOGAMEON
: A species that contains both apomictic and nonapomictic individuals.

APOMIXIS
: Reproduction in which sexual organs or related structures take part but fertilization does not occur, so that the resulting seed is vegetatively produced.

ASEXUAL REPRODUCTION
: Reproduction which does not involve the union of gametes.

ASYNAPSIS
: Failure of pairing of homologous chromosomes during meiosis.

AUTOGAMY
: Reproduction by self-fertilization.

AUTOPOLYPLOID
: Polyploid that arises by the multiplication of the complete haploid genome of a single species.

BACKCROSS BREEDING
: A system of breeding whereby recurrent backcrosses are made to one of the parents of a hybrid accompanied by selection for a specific character or characters.

BACKCROSS
: A cross of a hybrid to either of its parents. In genetics, a cross of a heterozygote to a homozygous recessive. SEE test cross.

BALANCE
: The condition in which genetic components are adjusted in proportions that give satisfactory development. Balance applies to individuals and populations.

BASIC NUMBER
: The number of chromosomes in ancestral diploid ancestors of polyploids, represented by "x".

BASIC SEED
: Means the seed planted to produce certified or commercial seed.Provenance:

BIAS
: A consistent and false departure of a statistic from its proper value.

BIOMETRY
: The branch of science which deals with statistical procedures in biology.

BIOTYPE
: A group of individuals with the same genotype. Biotypes may be homozygous or heterozygous.

BIOTYPE
: Distinct physiological races or strains within morphological species; a population of individuals with identical genetic constitution; may be made up of homozygotes or heterozygotes, of which the former would be expected to breed true.

BIVALENT
: A pair of homologous chromosomes united in the first meiotic division.

BREEDER SEED
: A class of certified seed directly controlled by the originating or sponsoring plant breeding institution, or person, or

designee thereof, and is the source for the production of seed of the other classes of certified seed.

BREEDING CYCLE (BREEDING ROTATION)

The shortest period between successive generations from germination of a seed to reproduction of the progeny; i.e., the seed-to-seed cycle.

BREEDING ROTATION

SEE Breeding cycle.

BREEDING SYSTEM

A particular mating system that involves a certain type or types of plant material, together with the necessary selection procedures; different strategies are used to improve self-pollinated crops to extract inbred pure lines and to improve cross-pollinated crops for population performance per se for the selection of superior heterozygous individuals to be vegetatively reproduced as clones or for the extraction of improved inbreds for use in hybrid production.

BREEDING

Propagation of plants for the purpose of improvement by deliberate selfings or hybridizations and subsequent testing and selection for desired criteria and objectives. The art and science of changing plants or animals genetically.

BUD SPORT

Branch, flower, or fruit that differs genetically from the remainder of the plant SEE also Chimera.

BULK BREEDING

The growing of genetically diverse populations of self-pollinated crops in a bulk plot with or without mass selection, followed by single-plant selection.

CENTROMERE

SEE kinetochore.

CERTIFIED SEED

A class of certified seed that is the progeny of Breeder, Foundation, or Registered seed...and is produced and handled under procedures established by the certifying agency for the purpose of maintaining genetic purity and identity. Seed used for commercial crop production produced from foundation, registered, or certified seed under the regulation of a legally constituted agency.

CHARACTER (CHARACTERISTIC)

Expression of a gene or group of genes

An attribute of an organism resulting from the interaction of a gene or genes with environment.

CHARACTERISTIC

SEE Character.

CHIASMA

An exchange of partners between paired chromatids in the first division of meiosis.

CHIMERA (CHIMAERA)

Mixture of tissues of genetically different constitution in the same part of a plant; may result from mutation, irregular mitosis, somatic crossing-over, or artificial fusion of unlike tissues (e.g., a "graft hybrid").

CHROMATID

Longitudinal half-chromosome that appears between the early prophase and metaphase stages of somatic mitosis and between the diplotene (at least) and the second metaphase stage in meiotic mitosis. One of two threadlike structures formed by the longitudinal division of a chromosome during meiotic prophase and known as a daughter chromosome during anaphase.

CHROMOSOMES

Microscopically small, dark-staining bodies visible in the nucleus of a cell at the time of nuclear division; the number in any species is usually constant; carriers of the genes, which are arranged in linear order. Structural units of the nucleus which carry the genes in linear order. Chromosomes undergo a typical cycle in which their morphology changes drastically in various phases of the life cycles of organisms.

CLEISTOGAMEON

A species that reproduces in part, by cleistogamy; apomixis is not present.

CLONAL VARIETIES

Consist of one clone or several closely similar clones propagated by asexual means, such as cuttings, tubers, corms, bulbs , rhizomes, divisions, grafts, or seed produced by obligate apomixis.)Examples:'Meyer' zoysiagrass, `Elberta' peach, `Russet Burbank' potato, `Coastal'bermudagrass, `Peace' rose, `Iceberg' chrysanthemum. Examples

of obligate apomicts: `Troyer' citrange (rootstock), `Higgins' buffelgrass.

CLONE

A group of organisms descended by mitosis from a common ancestor Individuals derived by vegetative propagation or apomixis from a single original parent.

CLONES

Outbreeding mating system that involves perennial or quasi-annual vegetative material; homogeneous, heterozygous, isolated by selection of superior recombinants or transgressive segregates in the F1, between heterozygous parental clones and subsequently multiplied by vegetative propagation (monogenotypic); examples are potato, cassava, sweetpotato, rubber, mango, avocado, apple, pear, banana pineapple, strawberry, brambles, grape, peach, cherry, almond, citrus, date, Jerusalem, artichoke, yams, black pepper (Piper), olive, fig, pistachio, and edible aroids.

COLCHIPLOID

Colchicine-induced polyploid.

COMBINING ABILITY (CA)

"General combining ability" is the average progeny performance of a cultivar in a series of crosses;"specific combining ability" is the deviation from the performance predicted from general combining ability. GENERAL CA: average performance of a strain in a series of crosses. SPECIFIC CA: deviation from performance predicted on the basis of general combining ability.

COMPLEMENTARY GENES

Genes that are similar in phenotypic effect when present separately but react to produce new characters when they are combined; a 9:7 ratio results in the F2 if two such genes are complementary for a dominant effect and a 15:1 ratio if they are complementary for a recessive effect

SEE Duplicate factors).

COMPOSITE-CROSS POPULATIONS

A population generated by hybridizing more than two varieties and/or lines of normally self-fertilizing plants and propagating successive generations of the segregating population in bulk in specific environments so that natural selection is the principal force acting to produce genetic change; artificial selection may also be imposed on the population, the resulting population is expected to have a continuously changing genetic makeup; breeder seed is not maintained as originally released

Examples: `Harlan' barley, `Mezcla' lima bean.

COUPLING

Linked recessive alleles occur in one homologous chromosome and their dominant alternatives occur in the other chromosome

Opposed to repulsion in which one dominant and one recessive occur in each member of the pair of homologous chromosome.

COVARIANCE

The mean of the product of the deviation of two variates from their individual means. A statistical measure of the interrelation between variables.

CROSS-OVER UNIT

An exchange frequency of 1% between two pairs of linked genes.

CROSSING OVER

The exchange of corresponding segments between chromatids of paired (homologous) chromosomes; it is a process inferred cytologically from new associations of parts of chromosomes, both of which may be observed in an exchange of factors and in combinations of factors differing from those that came in with the parents; the term "genetic cross-over" may be applied to these new gene combinations

SEE Recombination. Its genetic consequence is the recombination of linked genes.

CULTIGEN

Plant or group of plants known only in cultivation; presumed to have originated under domestication.

CULTIVAR (abbrev cv.)

A term contracted from "cultivated variety" defined under the International Code of Nomenclature of Cultivated Plants (1969) as "an assemblage of cultivated plants which is clearly distinguished by any characters (morphological, physiological, cytological, chemical, or others), and which, when reproduced (sexually or asexually), retains its distinguishing characters." This term is essentially different from the concept of botanical variety, which is always in the Latin form prescribed by the International Code of Botanical Nomenclature. These

plants are named at three main levels: Genus, species, and cultivar, of which the first two are governed by the Botanical Code and the last is a "fancy name" in a modern language with capital initial letters and distinguished clearly from the botanical name or accepted common name by being enclosed in single quotation marks (e.g.,'Hamlin' sweet orange) or preceded by cv (e.g., *Citrus sinensis* Osbeck cv. Hamlin. Examples of cultivar categories distinguished under the Cultivated Plant Code follow: A clone or several closely similar clones, including distinguishable bud mutations derived from a clone. Note, however, that neither a clone nor any other category listed is designated as a cultivar (=variety) until it has been released; i.e., when the name is validly published under prescribed rules. One or more lines of normally self-pollinating individuals or inbred lines of normally cross-pollinating individuals. Cross-pollinated individuals that may show genetic differences but have one or more characters by which they can be differentiated from other cultivars of like or different origin. An assemblage of individuals reconstituted on each occasion by crossing,including single crosses, double crosses, three-way crosses, top crosses, and intervarietal hybrids the primary difficulty in the foregoing categories, which refer to cultivated plants produced principally by systematic breeding and release to growers, is the necessity for continual redefinition of guidelines for classifying populations (i.e.,the establishment of precise criteria), particularly those of cultivated plants produced by sexual means such as agricultural agronomic), vegetable, tree, shrub, and flower seeds. General practice for the latter includes the substitution of common for scientific names and variety for cultivar, variety being specifically defined as the International Code of Nomenclature of Cultivated Plants. SEE Federal Seed Act of 1938 as Amended and Regulations (1976). Guidelines for classifying cultivated plant populations (1978), and Plant patents.

CYBRID

Hybrid cytoplasm from protoplast fusion.

CYTOCHIMERA

Chromosomal chimera; e.g., one having different chromosome numbers in the layers; similar but not necessarily identical to a mixoploid.

CYTOKINESIS

The division of cytoplasm into cells.

CYTOPLASMIC INHERITANCE

Transmission of hereditary characters through the cytoplasm as distinct from transmission by genes carried by chromosomes

Detected by differing contribution of male and female parents in reciprocal crosses.

DEFICIENCY

The absence or deletion of a segment of chromosome.

DEGREES OF FREEDOM, NUMBER OF

The number of independent comparisons that can be made in a set of data.

DETASSEL

Remove the tassel (male inflorescence) as in maize.

DEVIATION

Departure of an observation from its expected value.

DIALLEL CROSS, COMPLETE

The crossing in all possible combinations of a series of genotypes.

DICOTYLEDONS (Dicotyledoneae)

Plants woody or herbaceous, stems with vascular elements like a hollow cylinder or in bundles in a single circle (rarely scattered), leaves typically netted and veined in palmate or pinnate form, flowers basically with parts in fours or fives or multiples thereof, or numerous, embryos typically with two cotyledons.

DIHAPLOID

Haploid (2x) derived from a tetraploid (4x).

DIHYBRID

Heterozygous with respect to two genes.

DIOECIOUS

A population consisting of gynoecious and androecious plants

SEE androecious, andromonoecious, dioecious, gynomonoecious, hermaphroditic, monoecious, trimonoecious.

DIPLOID

Having two chromosomes of each kind; somatic tissues of higher plants and animals are ordinarily diploid in chromosomal constitution in contrast to haploid (monoploid) gametes or the rare instances of haploid plants.

DIPLOTENE
: The stage of meiosis which follows pachytene and during which the four chromatids of each bivalent move apart in two pairs but remain attached in the region of chiasmata.

DISJUNCTION
: The separation of chromosomes at anaphase.

DISOME
: SEE Monosomic.

DOMINANCE
: Intra-allelic interaction such that one allele manifests itself more or less, when heterozygous, than its alternative allele.

DOMINANT
: Applied to a member of an allelomorphic pair of characters with the quality of manifesting itself wholly or largely to the exclusion of the other member, or recessive.

DONOR PARENT
: The parent from which one or a few genes are transferred to the recurrent parent in backcross breeding.

DOUBLE CROSS
: The first generation hybrid between two single crosses. The mating of two different sets of inbred lines to produce two different single crosses which are then mated, as in double-cross hybrid corn and the like.

DRIFT
: Changes in gene and genotypic frequencies in small populations due to random processes.

DUPLEX
: SEE nulliplex.

DUPLICATE FACTORS (GENES)
: Different or independent factors with the same expression; the reverse of a multiple allelomorphic series in which changes in the same gene produce different effects.

DUPLICATION
: Occurrence of a segment of a chromosome twice in the haploid set.

DYSGENIC
: Detrimental to hereditary qualities in a stock (e.g., a cultivar or population); biologically defective or deficient.

DYSPLOID
: A plant or species in which the chromosome number is more or less than the expected normal euploid number.

DYSPLOIDION
: A species of morphologically similar members of a dysploid series; all members are sexually reproductive (i.e., apomixis is not present).

DYSPLOIDY
: Abnormal ploidy as in the appearance of diploid (2x) or triploid (3x) individuals in a normally tetraploid (4x) population or of triploid and tetraploid ones in a normally diploid population.

ELITE TREE
: Plant of proved good combining ability.

EMASCULATION
: Removal of the anthers from a flower.

EMBRYOGENETICS
: Heredity and variation of embryos; the genetics of embryos.

ENVIRONMENT
: The sum total of the external conditions which affect growth and development of an organism.

EPIGENETIC
: A change in some morphological character as a result of localized influences different from the normal or usual pattern that occurs after development of an organism is initiated; a term used in connection with changes that result from plant tissue culture or animal embryological studies (used in apposition to Genetic).

EPIPHYTOTIC
: An unarrested spread of a plant disease.

EPISTASIS
: Dominance of one gene over a nonallelic gene The gene suppressed is said to be hypostatic More generally, the term epistasis is used to describe all types of interallelic interaction whereby manifestation at any locus is affected

by genetic phase at any or all other loci Interallelic interaction; the suppression of the action of a gene or genes by a gene or genes not allelomorphic to those suppressed; suppressed genes are said to be "hypostatic"; the opposite of dominance which refers to the intraallelic action of members of an allelomorphic pair An example is "piping", the leaf form typical of the "Maipure" group of pineapple (Ananas comosus); in which the upper and lower sides of the margin are folded over and fused and are completely spineless; the genotype is PPSS, although plants heterozygous for P are epistatic to the S or s alleles.

ERROR VARIANCE

Variance arising from unrecognized or uncontrolled factors in an experiment with which the variance of recognized factors is compared in tests of significance.

EUPLOID

An organism or cell having a chromosome number that is an exact multiple of the monoploid or haploid (1n) number; terms used for a euploid series are haploid (1x), diploid (2x), triploid (3x), tetraploid (4x), etc.

EUPLOIDION

A species sexually reproduced (i.e., apomixis is not present) and composed of segments with a common origin arranged in a euploid series; the segments are morpholoically separable but are similar and tend to intergrade.

EXOTIC

Introduced from another country.

EXPRESSIVITY

The degree of manifestation of a genetic character.

EXSERTION

Elongation beyond enclosing structure to expose (eg
exserted style).

F1

The first filial generation, the first generation of a given mating
The first generation of a cross.

F2 VARIETIES

The next generation seed derived from the hybrid (F1) generations; the variety cannot be perpetuated by growing additional generations. Examples: `Foremost F2' tomato, `Market Pride' cantaloupe,'Violet Blue' petunia, `Seven-Eleven' pansy.

F2

The second filial generation obtained by self-fertilization or crossing *inter se* of F1 individuals.

F3

Progeny obtained by self-fertilizing or crossing *inter se* of F2 individuals.

FACTOR

Same as gene.

FAMILY

A group of individuals directly related by descent from a common ancestor.

FEDERAL SEED ACT of 1938 as Amended and Regulations (1976)

The U.S statute governing aspects of seed production, handling, and sales.

FERTILITY

Ability to produce viable offspring.

FERTILIZATION

Fusion of the nuclei of male and female gametes.

FIRST-GENERATION SYNTHETIC VARIETIES (Syn-1)

First-generation progenies derived by intercrossing a specific set of clones or seed-propagated lines; these may include varieties of normally cross-fertilizing or self-fertilizing crops into which mechanisms have been introduced to maximize cross-fertilization such as male sterility or self-incompatibility. These varieties usually contain mixtures of seed that result from cross-,self-and sib-fertilization; the variety consists of only the first-generation progenies after intercrossing and cannot be reproduced from seed of the first generation. Examples: `Gahi' pearl millet, `Vitagraze' rye, `Tempo' alfalfa.

FLORA

An essentially monographic treatment or assemblage of plants of a given area, usually arranged in systematic fashion; e.g., G Bentham and J.D Hooker, 1862-1863 Genera plantarum. London 3 vol.; or A Engler and L Diels, 1964 Syllabus der Pflanzenfamilien, 12th ed Berlin, as world floras; or J Hutchinson, 1948 British flowering plants

London and M.L Fernald, 1950. Gray's manual of botany, 8th ed., etc., as regional floras.

FORM

A category ranking below a subspecies, used chiefly for certain minor variations (e.g., the yellow passion fruit, *Passiflora edulis* f*flavicarpa*, whose fruit is yellow rather than purple as in *P edulis* proper); a sporadic variant, equivalent to "variety" of some botanists but generally trivial such as corolla or fruit color or habit response.

FOUNDATION SEED

A class of certified seed that is the progeny of Breeder or Foundation seed and is produced and handled under procedures established by the certifying agency...for the purpose of maintaining genetic purity and identity. Seed stock produced from breeder seed by or under the direct control of an agricultural experiment station. Foundation seed is the source of certified seed, either directly or through registered seed.

FOUNDATION SINGLE CROSS

A single cross in the production of a double, three-way, or top cross.

FRUIT CYCLE

The period, or length of time, between fruit set and maturity.

FRUITING CYCLE (FRUITING ROTATION)

The shortest period between successive generations of a plant; i.e., from propagule to fruit maturity (differs from breeding cycle in that the former may be reproduced vegetatively rather than from seed).

GAMETE

Cell of meiotic origin specialized for fertilization.

GENE FLOW

Spread of genes by crossing.

GENE FREQUENCY

The proportion in which alternative alleles of a gene occur in a population.

GENE INTERACTION

Modification of gene action by a nonallelic gene or genes.

GENE POOL SYSTEM

Three informal categories by Harlan and de Wet (cited in Harlan, 1975) to provide a genetic perspective and focus for cultivated plants.

GENE

The unit of inheritance. Genes are located at fixed loci in chromosomes and can exist in a series of alternative forms called alleles.

GENERAL COMBINING ABILITY

SEE Combining ability.

GENETIC EQUILIBRIUM

The condition in which successive generations of a population contain the same genotypes in the same proportions with respect to particular genes or combinations of genes.

GENETIC

The normal or usual pattern of change in a morphological character that occurs after development of an organism is initiated.

GENIC STERILITY

A type of male sterility conditioned by nuclear genes; may be transmitted by either parent.

GENOME

A set of chromosomes corresponding to the haploid set of a species.

GENOTYPE

The genetic constitution (gene, makeup), expressed and latent, of an organism; individuals of the same genotype breed alike; contrast (this behavior) with phenotype.

GENUS

A category of classification between a family and a species; a group of structurally or phylogenetically related species or consisting of an isolated species that exhibits unusually differential features (monotypic genus); distinctions between genera are sometimes empirical or arbitrary and liable to modification as knowledge advances; a category antedating binomial nomenclature, composed of plants with two or three characters of reproductive structures in common, although characters used for separation vary widely among different families.

GERMPLASM

The sum total of the hereditary materials in a species.

GRAFT-CHIMAERA
: Plants composed of tissues in intimate association from two different individuals; they originate by grafting name with a plus (+) sign used instead of a X, as for a graft hybrid.

GRAFT-HYBRID
: A sexual hybrid between two or more species or genera, which can be denoted by the botanical names of the parents connected by a multiplication sign (X) = formula, or a botanical name for an interspecific hybrid consisting of the generic name followed by a Latin collective epithet, the latter immediately preceded by X; or for an intergeneric hybrid, a "generic name" preceded by X and normally followed by a Latin collective epithet; a "generic" name of a multigeneric hybrid usually consists of a personal name with the suffix -ara.

GUIDELINES FOR CLASSIFYING CULTIVATED PLANT POPULATIONS (1978)
: An appendix to the Federal Seed Program Review (1980) which gives more precise definitions of the various categories of cultivated varieties.

GYNOECIOUS
: A plant having all pistillate flowers (sometimes called all-female). SEE androecious, andromonoecious, dioecious, gynomonoecious, hermaphroditic, monoecious, trimonoecious.

GYNOMONECIOUS
: A plant having perfect (hermaphroditic) and pistillate flowers. See androecious, andromonoecious, dioecious, gynoecious, hermaphroditic, monoecious, trimonoecious.

HAPLOID
: An organism or cell with only one complete set of chromosomes (i.e., 1n); having half of one parent's chromosomes.

HEREDITY
: Resemblance among individuals related by descent.

HERITABILITY
: The proportion of variability that results from genetic causes; equivalent to total genetic variation, which is total variation less environmental variation; also that proportion of the variation of a population that is transmitted to progeny.

HERMAPHRODITIC
: A plant having all perfect (hermaphroditic) flowers. SEE androecious, andromonoecious, dioecious, gynoecious, gynomonoecious, monoecious, trimonoecious.

HERMAPHRODITISM
: Reproductive organs of both sexes present in the same individual or in the same flower in higher plants.

HETEROCARYOSIS
: The presence of two or more genetically different nuclei within single cells of a mycelium.

HETEROGAMEON
: A species made up of races that if selfed, produce morphologically stable populations; apomixis is not present.

HETEROGENESIS
: Alternation of generations, especially a unisexual dioecious alternating with one or more parthenogenetic generations.

HETEROSIS
: Hybrid vigor such that an F1 hybrid falls outside the range of the parents with respect to some character or characteres. Usually aplied to size, rate of growth, or general thriftiness.

HETEROTHALLY
: Haploid incompatibility in fungi (opposite of homothally).

HETEROTYPIC DIVISION
: SEE Reductive division.

HETEROZYGOTE
: An organism with unlike members of any given pair or series of allelomorphs, consequently producing unlike gametes.

HETEROZYGOUS
: The condition in which homologous chromosomes of an individual possess different genes of the same allelomorphic series.

HOMOLOGOUS
: Chromosomes of an allopolyploid that are similar in size, shape, and function, but are not homologous. For

example, chromosome 5A and 5D in bread wheat are homoeologous since they have the same code number, but belong to different genomes (A and D, respectively). Different genome letters indicates that the wheat chromosomes came from different ancestral diploid species when the allopolyploid wheat was formed. SEE homologous.

HOMOGENEON

A genetically and morphologically homogeneous species in which apomixis is not present and all members are interfertile.

HOMOLOGOUS

Members of paired chromosomes in somatic cells; the former are similar in size, shape, and supposedly in function, one being derived from the male parent, the other from the female.

HOMOLOGY OF CHROMOSOMES

Applied to whole chormosomes or parts of chromosome which synapse or pair in meiotic prophase.

HOMOTYPIC DIVISION

SEE Reductive division, Fruit setting, Apomixis).

HOMOZYGOTE

An individual whose chromosomes carry identical members of any given part of allelomorphs; the germ cells therefore are alike with respect to this locus and the individual will breed true.

HOMOZYGOUS

Having like alleles at corresponding loci on homologous chromosomes. An organism can be homozygous at one, several, or all loci.

HYBRID VARIETIES (F1)

First-generation (F1) progenies from a cross, produced by controlling the pollination, between (1) two inbred lines, (2) single crosses, (3) a single cross and an open-pollinated or a synthetic variety, or (5)two selected clones, seed lines, varieties, or species. A line cross between two closely related inbreds (theoretical coefficient of parentage at least 0.87) is considered equivalent to a line (inbred) variety; the hybrid variety cannot be reproduced from seed of the hybrid generation. Examples of conventional hybrids: `Hybrid-7' spinach, `US13' hybrid corn, `RS-610' hybrid grain sorghum,, `Moreton' hybrid tomato, `Comanche' hybrid petunia; examples of varieties that contain substantial numbers of hybrid seeds: `Market Prize' hybrid cabbage, `Valley' hybrid sunflower, `Picadilly' hybrid cucumber.

HYBRID VIGOR

The situation in which the cross of two parents produces hybrids that show increased vigor in comparison to that of either parent.

HYBRID

The product of a cross between genetically unlike parents.

HYBRIDS

Involve inbred lines with favorable combining ability of annual or biennial, or sometimes perennial, seed-propagation material; homogeneous, highly heterozygous, with inbred lines for use in hybrid production derived from continuous selfing of selected plants in cross-pollinated populations (verges on monogenotypic)l examples are maize, onion, Brussels sprouts, kale, tomato, beets, cucurbits, black pepper (Piper), cloves, fig, radish, Chinese cabbage, and sunflower.

HYPERPLOID

SEE Aneuploid.

HYPOPLOID

SEE Aneuploid.

HYPOSTATIC

SEE Epistasis.

HYPOTRIPLOID

A triploid (3x) lacking one or more chromosomes, as in instances in which 2n = 20 instead of the expected 21 derived from a basic (x) number of 7.

IDEOTYPE

The ideal architectural plant type.

INBRED LINE

A line produced by continued inbreeding. In plant breeding a nearly homozygous line usually originating by continued self-fertilization, accompanied by selection. A relatively true-breeding strain that results from at least five successive generations of controlled fertilization or of backcrossing to a recurrent parent with selection, or its

equivalent, for specific characteristics.

INBRED PURE LINES

Involves inbreeding annual seed-propagated material; homogeneous, homozygous isolated by selection of desired recombinants or segregates in F2-F7 generations of crosses between parental pure lines (generally monogenotypic, can be blended to form multilines); examples are tomato, lettuce, soybean, pea, cowpea, snapbean, field bean, Arabian coffee, pepper (Capsicum), eggplant, okra, lentil, and papaya (`Solo').

INBRED-VARIETY CROSS

The F1 cross of an inbred line with a variety.

INBREEDING C`FFICIENT

A quantitative measure of the intensity of inbreeding.

INBREEDING

The mating of individuals more closely related than individuals mating at random.

INDEPENDENCE

The relationship between variables when the variation of each is uninfluenced by that of others, that is, correlation is zero.

INTERFERENCE

The effect of one crossover influencing the probability than another will occur in the immediate vicinity.

INTROGRESSIVE HYBRIDIZATION

Hybridization followed by recrossing with the parental species in such a way that certain features of one species become transferred to the other species without impairment of taxonomic integrity.

INVERSION

A rearrangement of a chromosome segment so that its genes are in reversed linear order.

INVERSION

A rearrangement of a group of genes in a chromosome in such a way that their linear order is reversed.

IRRADIATION

Exposure of plants or plant parts to X-rays or other radiations to increase mutation rates.

ISOALLELES

Alleles indistinguishable except by special tests.

ISOGENIC LINES

Two or more lines differing from each other genetically at one locus only. Distinguished from clones, homozygous lines, identical tiwns, etc., which are identical at all loci.

ISOLATION

The separation of one group from another so that mating between or among groups is prevented.

KARYOTYPE

The sum of the specific characters of a nucleus, such as chromosome number, size, and form.

KIND

Means one or more related species or subspecies that, singly or collectively, is known by one common name; e.g., soybean, flax, carrot, and radish.

KINETOCHORE

Spindle attachment. A localized region in each chromosome to which the "spindle fiber" apears to be attached and which seems to determine movement of the chromosomes during mitosis and meiosis.

Box 7609 North Carolina State University Raleigh, NC 27695-7609 (919) 515-5363

Created by T.C. Wehner and C. Barrett 5 September, 1996; design by C.T. Glenn;
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