

Allele – The specific composition of DNA at each gene is known as an allele. Multiple alleles of a gene may be generated by mutations which are structural or chemical changes in DNA at a specific location on a chromosome (locus), this generates genetic variation.

Biodiversity - The total variability within and among species of living organisms and the ecological complexes that they inhabit. Biodiversity has three levels - ecosystem, species, and genetic diversity reflected in the number of different species, the different combination of species, and the different combinations of genes within each species.

Biotype - A group of individuals within a population occurring in nature, all with essentially the same genetic constitution. A species usually consists of many biotypes. See also "ecotype".

Chromosomes - Are thread like DNA and protein-based structures in cells whose function is the orderly duplication and distribution of genes during cell division.

Cultivar - The international term cultivar denotes an assemblage of cultivated plants that is clearly distinguished by any characters (morphological, physiological, cytological, chemical, or others) and when reproduced (sexually or asexually), retains its distinguishing characters.

DNA fingerprinting – The process of using molecular markers to identify individuals

Ecological niche - Role of an organism in an ecological system. Includes the physical space in a habitat occupied by an organism; its functional role in the community (e.g., its trophic position); and its position in environmental gradients of temperature, moisture, pH, soil, and other conditions of existence.

Ecological type - A land classification category that is more specific than a phase of a habitat type. Ecological types are commonly used to differentiate habitat phases into categories of land, which differ in their ability to produce vegetation or their response to management. Syn. ecological response unit, ecological site.

Ecotype - A population of plants that has become genetically differentiated in response to the conditions of a particular habitat. The plants may vary in growth habit, maturity, and other characteristics such as pubescence and flower color. Sometimes referred to as a geographical race. A locally adapted population within a species which has certain genetically determined characteristics; interbreeding between ecotypes is not restricted.

Ecovar - The offspring of native species that have been developed from original plant material collected from a specific ecological region. Selection is done with minor emphasis on improving agronomic characteristics, and major emphasis on maintaining genetic diversity. See also "ecotype".

Foundation seed – The progeny of breeder seed that is so handled as to most nearly maintain specific genetic identity and purity. Production may be carefully supervised by the originating agency and approved by the certifying agency, the agricultural experiment station, or both. See also "seed certification classes".

Gene - a segment of DNA that codes (by sequencing 4 distinct nucleotides) for a protein or enzyme, responsible for producing all growth and development processes of an organism. Located on a specific location on chromosomes.

Gene flow - The transfer of genes from one population to another. See also "genetic flow".

Gene frequency - The relative frequency with which a particular gene is present in a particular population of a species or other group.

Gene pool - The total stock of genes in a breeding population, with each gene representing a number of alleles. See also "genetic pool".

Genetics - is the field of study that deals with variation and its transmission from parents, to their progeny that is inheritance.

Genetic diversity - The total amount of genetic variation present in a population or species. Having a heterogeneous constitution, reacting differently to diverse external condition. (Applied to a breeding population, variety, or species.) Ultimately a function of allelic differences.

Genetic drift - A change in gene frequency that occurs in small populations as a result of random sampling error during reproduction. The fluctuation in gene frequency occurring in an isolated population, presumably due to random variations from generation to generation.

Genetic erosion - The loss of genetic diversity between and within populations of the same species over time; or a reduction of the genetic base of a species due to human intervention, environmental changes, etc.

Genetic flow - The exchange of genes between different populations. Also termed migration, it is considered to be a source of genetic variation. A single introduction of genes into a new population is known as gene exchange. If gene migration is constant and recurrent it is known as gene flow. The closer populations are related spatially and genetically, the more likely the chances of gene flow.

Genetic pool - The totality of genes and gene complexes of a given population at a given time. The sum of all genetic information carried by all individuals of an interbreeding population. All of the alleles of all the genes in a population.

A Glossary of Terms for Restoration Genetics

Paul R. Salon
USDA-NRCS Syracuse, NY

Genetic shift – A change in the germplasm balance of a cross pollinated variety, usually caused by environmental selection pressures, or nursery practices and selection.

Genetic vulnerability - Having a narrow range of genetic diversity and reacting uniformly to diverse external conditions. (Applied to breeding populations of varieties or species).

Genotype - The genetic constitution of an individual or group of plants. It is the set of alleles it possesses at a certain locus or over particular or all loci.

Germplasm – Genetic material that determines the morphological and physiological characteristics of a species.

Heterozygote – If alleles at a locus are different.

Homozygote – If alleles at a locus are the same, the locus is homozygous and the organism is a homozygote for that gene or trait.

Inbreeding – Condition resulting from matings between individuals that possess alleles derived from a common ancestor(s). May lead to reduced vigor.

Molecular markers – Identify differences in DNA among individuals based on variation in the length of DNA fragments. The length are determined by using enzymes which cut specific segments of DNA and are separated by gel electrophoresis by size. Different genotypes will have different lengths between these recognized segments.

Native species - A native plant species is one that occurs naturally in a particular region, state, ecosystem, and habitat without direct or indirect human actions. Climate, soil, and biotic factors determine its presence and evolution in an area. Synonyms of native include indigenous, endemic, aboriginal.

Phenotype - (1) The external appearance or discernible characteristics of an organism, resulting from interaction between an organism's genetic makeup (genotype) and the environment. A group of individual plants may appear alike (phenotypically) but not have the same genotype, or they may vary in appearance and have the same genotype. (2) Observable characteristics.

Population - (1) The aggregate of organisms which inhabit a particular area or region; (2) a (specified) portion of such an aggregate, usually a group of organisms of the same kind occupying an area small enough to allow interbreeding.

Population genetics - A branch of genetics dealing with the frequency and distribution of genes, mutants, genotypes, etc. among populations of organisms. Population genetics is now based upon an increasing input of laboratory and field observations under an array of environments; much of this work involves the documentation and interpretation of genetic variability in natural populations.

Reclamation - Restoration of a site or resource to a desired condition to achieve management objectives or stated goals. The construction of plant, soil, and topographic conditions, after disturbance, which permits the disturbed site to function adequately within its ecosystem. However, the constructed conditions may not be identical to predisturbance conditions. The process of reconverting disturbed lands to their former uses or other productive uses.

Restoration - The process of restoring site conditions as they were before land disturbance. Note: restoration involves restoring a site to a specific point in time.

Seed certification - A system whereby seed of plant cultivars (and pre-varietal releases) is produced, harvested and marketed under authorized regulation to insure seed of high quality and genetic purity.

Seed certification classes - Classes of seed produced by a grower to ensure the purity of the genetic material. Seed, which undergoes the certification process, is typically inspected during the growing season or at harvest and the seed is tested. Certification classes include: Breeder, Foundation, Registered, Certified, and Common. See also "Breeder seed", "Foundation seed", "Registered seed", "Certified seed", and "common seed".

Source-Identified Seed - (1) Source identified propagating materials are seed, seedlings, or other propagating materials collected from natural stands, seed production areas, seed fields, or orchards where no selection or testing of the parent population has been made. (2) One of the classes of pre-varietal releases recognized by AOSCA.

Variety - (1a) The botanical nomenclature division consisting of more or less recognizable entities within species that are not genetically isolated from each other, below the level of subspecies, and is indicated by the abbreviation "var." in the scientific name (see "botanical variety"); (1b) The rank of taxa below subspecies but above forma; a plant which retains most of the characteristics of the species, but differs in some way such as flower or leaf color, size of mature plant, etc

References:

USDA-NRCS, National Plant Materials Manual, Third Edition, June 2000.

Smith, E.S and K. Halbrook, 2004. A Plant Genetics Primer: Basic Terminology. Native Plants, Fall 2004. 105 – 111.