

Biology 12.4

Plant Reproduction

Reproduction

1. Asexual
 - a. vegetative reproduction
 - b. offspring have same genetic makeup as parent
 - c. useful for producing a consistent product
2. Sexual
 - a. involves formation of flowers and seeds
 - b. genetic variation occurs. Results in the recombination of genes
 - c. useful to develop a new desired trait (sugar beets, redder flowers, etc.)

Vegetative Reproduction (VR)

1. natural VR when the plant reproduces itself
 - a. a portion of the plant can form a complete new plant
 - b. underground roots and stems can develop new plants (mint, weeds, bulbs, potato tubers)
 - c. runners are surface stems can develop into new plants (strawberry plants and spider plants)
 - d. Adventitious roots grow from the leaves, stems or other organs of the mother plant. Forming a plantlet.
2. induced VR involves purposeful methods
 - a. meristemic tissues are encouraged to grow
 - b. layering is a technique of bending a stem to covering a portion of it in soil (natural layering by berry plants)
 - c. stem cutting (slip) involves placing a cut, woody stem in moist soil (hollies, yews, roses)
 - d. leaf cutting involves placing a cut leaf in moist soil (African violet)

Grafting and budding

1. these are not reproduction since no new plant results
2. grafting involves growing a cut stem (scion) from one plant on another (stock)
3. budding involves placing a bud and sliver of bark in a slit on the stock bark
4. dwarf trees can be produced by grafting a fast growing plant stem onto a slow growing stock. (dwarf apple and lemon)

Reproductive anatomy

1. Six basic flower parts
 - a. pedicel: the stalk that holds the flower
 - b. receptacle: the enlarged end of the pedicel
 - c. sepals: usually green, protective structures. collectively called the calyx
 - d. petals: the ring of structures inside the sepals. Usually colored
 - e. stamens: the pollen producing structures
 - f. pistil: innermost structure of flower to be pollinated
2. Stamen
 - a. filament is the stalk of the stamen
 - b. anther bears the pollen
 - c. pollen grains form a tough, protective membrane around two male gametes
3. Pistil
 - a. the stigma is the surface having a sticky surface to catch pollen

- b. the style supports the stigma
- c. the ovary contains the ovules
- d. the ovule contains the egg
- e. flower ovaries can contain 1 or many ovules (peach, tomato)
- f. flowers can have 1 or many pistils (ovaries) (blackberry)

Pollination

- 1. self-pollination involves pollen from a flower adhering to its own pistil
- 2. cross-pollination involves transferring pollen from one plant to another
 - a. insects and birds attracted to color of petals or nectar
 - b. wind can carry pollen to other flowers
 - c. some flowers produce only stamen and others only pistils (either on same plant or different plants)

Fertilization

- 1. pollen on the stigma stimulates growth of a pollen tube
- 2. the pollen tube grows through the style to the ovule
- 3. one male gamete fuses with the egg cell in the ovule (fertilization) to form the seed
- 4. the second male gamete fuses with two haploid "egg" cells to form food for the embryonic plant called *endosperm*
- 5. the fertilization of two nuclei is called double fertilization

Fruit

- 1. the ovary develops into fruit
- 2. simple fruit develops from a single ovary (peach has three layers of mature ovary 1) skin, 2) pulp, 3) stone)
- 3. one vary with many ovules: peas (seeds) in a pea pod; apple, tomato
- 4. compound fruit develops from several separate ovaries
- 5. aggregate fruit results when multiple ovaries of one flower (raspberry)
- 6. multiple fruit results when a collection of ovaries develop together from multiple flowers

Seeds

- 1. develops from the ovule
- 2. consists of the seed coat, stored food, and embryonic plant
- 3. hilum is the scar where the seed attached to the ovary

The embryo

- 1. the hypocotyl develops into the stem
- 2. the epicotryl develops into the leaves
- 3. the radical (root) develops into the root

Germination

- 1. the beginning of embryonic plant growth
- 2. requires 1) moisture, 2) temperature, 3) and oxygen