



Plant propagation is the method by which reproduction, rejuvenation and/or perpetuation of a plant occurs. Sexual propagation is accomplished through exchange of genetic material between male (pollen) and female (ovary) parents resulting in seed production. Each viable seed contains three parts: the outer coat for seed protection; the endosperm and cotyledons which store the food reserves; and the plant embryo. Asexual or vegetative propagation involves removal of plant parts - roots, stems or leaves - to reproduce a genetically identical offspring.

The success of sexually reproduced seed, from the seed stage to plant depends on the conditions under which they are germinated and grown - the closer to optimum, the better. After choosing quality seed, whether purchased or saved, it is necessary to begin the germination process by breaking dormancy. As the requirements can differ from seed to seed, check for specific requirements. Breaking dormancy is initiated through appropriate stratification or chilling, and scarification, the opening of the seed outer coat - via soaking or scratching - to allow water to enter.

The correct levels of light, heat, moisture and air will insure complete germination. As the seed coat absorbs water, consistent and appropriate moisture levels are necessary to avoid deadly desiccation to the embryo. While oxygen is necessary for dormant seed, it is increasingly necessary during germination. A loose, well aerated media insures good oxygen supply. The level of heat instrumental for embryo development will vary from seed to seed. Make sure to check minimum, maximum and optimum temperature levels for each seed type. Light requirements also vary - some seeds require light, some dark and some are indifferent. Those that require light for germination should be sown on the surface or covered with a thin layer of growth media to allow for the light to penetrate through. Those requiring darkness for germination can be sown more deeply, limiting light exposure or the container may be covered to inhibit light penetration.

Transplanting germinated seedlings from trays to individual containers, is best done when the first true leaves have appeared. True leaves are the second set of leaves above or in between the seed leaves or cotyledons, which are the first to appear. Waiting too long will set the seedlings back often resulting in higher rates of mortality. When removing the seedlings from the growing media, handle by the leaves, taking care not to damage the delicate stems, or roots. About two weeks before planting outside, begin the acclimation process to allow the plants time to adjust to conditions of lower humidity, less available water and lower environmental temperatures. This growth slowing process encourages the young plants to store carbohydrates and develop stronger stems and thicker cell walls. Begin by placing plants into a lower light situation that is 45 - 50

degrees F, either in or out of doors. If placing the plants outside be sure to locate them in a lightly shaded area to prevent sun damage. To avoid excessive damage, limit exposure to extreme wind, light and temperature conditions until plants are completely hardened.

Asexual or vegetative propagation involves removing parts of an existing plant - roots, leaves and/or stems - in order to produce a genetically exact reproduction of the parent plant. The most common methods of vegetative propagation include cuttings - stem, medial, tip, cane, heel, and single or double eye; leaf cuttings - section, split vein, and whole leaf, with or without petiole; root cuttings; division; and layering techniques - air, tip, mound, simple, compound. Cutting techniques encourage growth after the plant parts have been removed. Layering encourages growth prior to removal from the parent plant.

Using sharp, disinfested tools, reliable methods, appropriate light and materials are paramount to successful asexual propagation as pathogens will often grow faster than the new plant tissue. Tools need to be sharp in order to make clean cuts that will develop new growth quickly. Disinfesting all tools prior to use and between cuts will minimize the risk of disease infestation from parent to child plant or from plant to plant. Sterile and appropriate media will provide a good growing environment, allowing oxygen flow, provide adequate moisture retention and encourage maximum root development without excessive fertility. Mixes vary but are generally comprised of some combination of sterile materials such as sand, perlite, vermiculite, and/or peat moss. In general, stem and leaf propagation occurs best in brighter light, while root propagation will be more successful when begun in the dark and moved into an appropriate light situation after above ground growth is visible. As with sexually reproduced seedlings, the new plants from asexual reproduction will need to be hardened off - often to a lesser extent - to become acclimated to general environmental changes. Always consult reliable sources for appropriate methods and timing for vegetative reproduction of all individual plant material. This will give the best opportunity for success.