Cutting (plant)

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A plant **cutting** is a piece of a plant that is used in horticulture for vegetative (asexual) propagation. A piece of the stem or root of the source plant is placed in a suitable medium such as moist soil. If the conditions are suitable, the plant piece will begin to grow as a new plant independent of the parent, a process known as **striking**. A stem cutting produces new roots, and a root cutting produces new stems. Some plants can be grown from leaf pieces, called leaf cuttings, which produce both stems and roots. The scions used in grafting are also called cuttings.

A magnolia stem cutting has been coaxed to form new roots, and is now a complete plant.

Contents

Technique

Some plants form roots much more easily than others. Stem cuttings from woody plants are treated differently, depending on the maturity of the wood:

- Softwood cuttings come from stems that are rapidly expanding, with young leaves. In many species, such cuttings form roots relatively easily.
- Semi-hardwood cuttings come from stems that have completed elongation growth and have mature leaves.
- Hardwood cuttings come from fully matured stems, and are often propagated while dormant.

Softwood cuttings of elm (*Ulmus*) are kept under a water mist to prevent them from drying out while they form roots.

Most plant cuttings are stem pieces, and have no root system of their own, they are likely to die from dehydration if the proper conditions are not met. They require a moist medium, which, however, cannot be too wet lest the cutting rot. A number of media are used in this process, including but not limited to soil, perlite, vermiculite,


Cuttings from a variety of succulents.

coir, rock wool, expanded clay pellets, and even water given the right conditions. Most succulent cuttings can be left in open air until the cut surface dries, which may improve root formation when the cutting is later planted.

In temperate countries, stem cuttings may be taken of soft (green or semi-ripe) wood and hard wood which has specific differences in practice. Certain conditions lead to more favorable outcomes for cuttings; timing, size, location on the plant, and amount of foliage are all important. In temperate countries, stem cuttings of young wood need to be taken in spring from the upper branches, while of hardened wood need to be taken in winter from the lower branches. Common bounds on the length of stem cuttings are between 5–15 centimetres (2.0–5.9 in) for soft wood and between 20–25 centimetres (7.9–9.8 in) for hard wood. Soft wood cuttings do best when about two thirds of the foliage removed, while hard wood stem cuttings need complete foliage removal.

The environment for cuttings is generally kept humid—often attained by placing the cuttings under a plastic sheet or in another confined space where the air can be kept moist—and partial shade to prevent the cutting from drying out. Cuttings in the medium are typically watered with a fine mist to avoid disturbing plants. Following the initial watering, the aim to keep the soil moist but not wet and waterlogged; the medium is allowed to almost dry out before misting again.

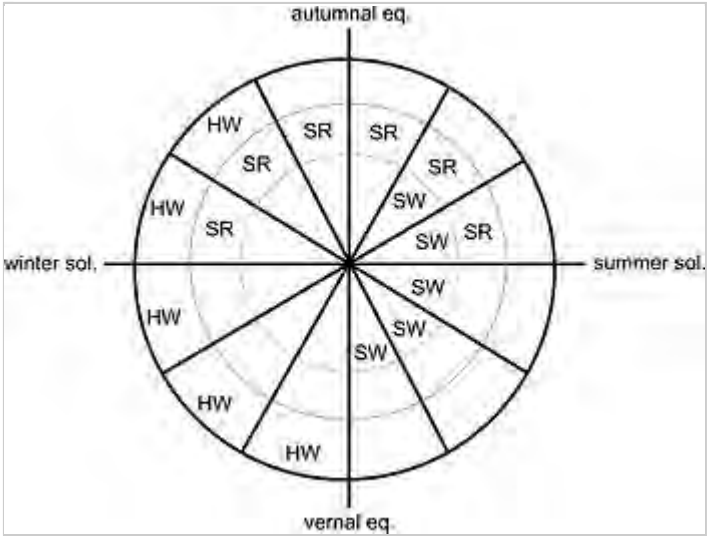
A rooting hormone may be administered to "encourage" growth and maturity in plants determined to be unlikely to grow. Though not essential, several compounds may be used to promote the formation of roots through the signaling activity of plant hormone auxins, and is helpful with especially hard plant species. Among the commonly used chemicals is indole-3-butyric acid (IBA) used as a powder, liquid solution or gel. This compound is applied either to the cut tip of the cutting or as a foliar spray. Rooting hormone can be manufactured naturally, such as soaking the yellow-tipped shoots of a weeping willow tree in water or to preparing a tea from the bark of a willow tree. Shoots or bark do better when soaked for 24 hours prior to using.[1] Honey, though it does not contain any plant hormones, can also aid in rooting success through its antiseptic quality.

Types of cuttings

Many vegetative parts of a plant can be used. The most common methods are:

- Stem cuttings, in which a piece of stem is part buried in the soil, including at least one leaf node. The cutting is able to produce new roots, usually at the node.
- Root cuttings, in which a section of root is buried just below the soil surface, and produces new shoots
- Scion cuttings are used in grafting.
- Leaf cuttings, in which a leaf is placed on moist soil. These have to develop both new stems and new roots. Some leaves will produce one plant at the base of the leaf. In some species, multiple new plants can be produced at many places on one leaf, and these can be induced by cutting the leaf veins.

Although some species, such as willow, blackberry and pelargoniums can be grown simply by placing a cutting into moist ground, the majority of species require more attention. Most species require humid, warm, partially shaded conditions to strike, thus requiring the approach above to be followed. Particularly difficult species may need cool air above and warm soil. In addition, with many more difficult cuttings, one should use the type of cutting that has the most chance of success with that particular plant species.[3]



Scheme of appropriate type of stem cuttings according to season, based on several sources.[2] Key: eq.:equinox, sol.: solstice, HW: hardwood, SR: semi-ripe, SW: softwood.

Improving results

Rose cuttings under plastic bottle greenhouse

There are ways of improving the growth of stem cutting propagations. Intensifying light allows cuttings to root and sprout faster, though the heat thus generated could cause the propagation material distress.[4] Azalea cuttings can be mildly heated in water to disinfect it from the fungus pathogen Rhizoctonia, and this could potentially be used for other plants.[5]

Softwood stemcuttings of *Buxus sempervirens*

Providing the right soil

Depending on the type of soil being used, several additives may need adding to create good soil for cuttings. These additions may include:

- chalk; to increase the pH-value of the soil; a pH of 6-6.5 is to be maintained
- organic substance/humus; to increase nutrient load; keep to a bare minimum though
- sand or gravel; to increase the soil's water permeability

For example, with plain potting soil, a third of the container should be filled with sand, to make suitable soil for cuttings.

Providing the right humidity

Although several options can be used here, usually semi-white plastic is used to cover the cuttings. The soil below and from the cuttings themselves is kept moist, and should be aerated once in a while to prevent formation of molds. A plastic bottle can be used as a small greenhouse to provide the right humidity level.

A white plastic greenhouse, used to keep the cuttings humid

See also

- Division (horticulture)
- Grafting
- Propagule
- Propagation of grapevines

References

1. "How to make your own rooting hormone". Pioneerthinking.com. 2005-11-02. Retrieved 2010-02-21.
2. "HO-37: New Plants from Cuttings". *purdue.edu*.
3. "Certain plant species having more success with certain types of cuttings". Healthrecipes.com. Retrieved 2010-02-21.
4. Wallheimer, Brian (January 23, 2012). "Study shines light on ways to cut costs for greenhouse growers". *Lopez and Currey*. Purdue University. Retrieved July 31, 2012.
5. Yao, Stephanie (December 24, 2009). "Hot Water Treatment Eliminates Rhizoctonia from Azalea Cuttings". *USDA Agricultural Research Service*. Physorg. Retrieved July 31, 2012.

External links

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Wikiversity has learning materials about ***Plant propagation***

Categories: Horticulture and gardening | Plant reproduction | Asexual reproduction

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