

## Handy tips for successful propagation by seed

### The right choice of soil / substrate

The seeds of most plants contain naturally stored nutrients that are essential to young plants after germination in building their basic organs: roots, stem axis and leaves. After that, the plant is able, with its green leafed organs, to carry out photosynthesis and to support itself (autotrophy). The nutrient storage is usually located in the cotyledons, or in some specific species in a special nutritive tissue (endosperm).

Common potting soil is not a good choice for seeding. It contains too much fertilizing salt, in which the seeds can easily rot and germinated plants die because of their fine roots being leached out by the salty soil. Therefore, you should always use cultivation soil or coconut substrate. Both are nutrient-poor, germ-free and water-permeable.

The main purpose of the seeding compost is to allow the seedlings to anchor their roots at the beginning of growth and to provide a consistent water supply. Minerals (fertilizers) are not necessary at that stage because, as mentioned, the seeds carry their own nutrients.

There is another advantage by using low-nutrition seeding soil: the plants develop more root-mass (main and side roots fed by the nutritive tissue of the seeds), and “search harder” for minerals, which results in a stronger growth after starting the photosynthetic activity. Plants that are propagated in standard-level nutrition soil, such as common potting soil, invest more in developing their stems and leaves rather than in building strong roots, which results more often in less steadfastness after planting out.



### Why we recommend coconut substrate for seed propagation

Commercial seeding compost is often made of peat, a resource that is being viewed critically from a nature conservation perspective. Peat comes from upland moors which are increasingly threatened as natural habitats. With moors vanishing, endangered species of plants and animals can become extinct.

A common 80 litre bag of peat pollutes the environment with 19 kg of carbon dioxide (CO<sub>2</sub>), which is more pollution than a car produces on a 100 km drive. Not only that, while it takes about 2,000 years to develop a 2-metre-thick layer of peat, an excavator can destroy this natural heritage in only 2 minutes.

Coconut, on the other hand, is a renewable resource that can be harvested every three months – and is climate-neutral. Coconut fibre substrate is, therefore, an environmentally-friendly alternative to peat. The coconut blocks are made from scraps of coconut fibre that are used to produce coconut ropes and mats. This way, the use of a former waste material creates jobs and additional income for coconut farmers and small businesses.

With regard to both a more careful use of natural resources and a sustainability-based environmental awareness, you should consider the use of environmentally friendly products for propagation right from the beginning. Coconut fibre substrate is an ideal renewable substitute for seeding compost since it is also low-nutrient, permeable and basically germ-free.

### Preparation

Fill up your propagation container to the top margin with substrate and slightly press down the surface area to create a good pouring edge of about 0.5 cm. Make sure there is enough earth in the pot so that the soil doesn't get too compressed while watering. The right amount of earth can be measured by having a slightly “springy” effect when pressing the surface, meaning you should feel a slight resistance. If there is not enough earth in the pot, the plants will have less space for building roots and can dry out more easily.



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## Water and the right way of watering

The water should be as least lime-deficient as possible. Unfortunately, in most cities the tap water is rather hard and limey. The best choice is usually rainwater, despite the air-pollution in cities which affects the purity of the water. In many garden centres you can also find water softener which you can simply add to the tap water. You can also boil off your tap water and use it to water your plants.

Ideally you should use water which is at room temperature, so as to avoid shocking your plants by watering them with hot or icy water.

After the whole propagation substrate has first been soaked, it is best to use a water sprayer during propagation and then spray daily to keep the earth moist. That way the water is finely dispersed, and you avoid the seeds becoming washed out while the common phrase to keep the soil moist but not wet, is best met.

It's commonly knowledge that plants need water, but the fact that the roots also need air and breath oxygen is often not considered. It is, therefore, important that the earth doesn't become solidified and that waterlogging does not occur, so that the roots can get air again after watering.

## Seed germination

Depending on the particular plant, it can take just a few days or as long as a couple of months before the seedling emerges from the seed and builds out the cotyledons. The seed leaves sometimes bring the seed coat above ground and emerge fully only afterwards. Between the cotyledons, the first real leaves, called primary leaves, already show.

How fast a plant will grow can depend on multiple conditions. At first the seedling grows due to the natural nutrients stored in the seed that are being transported to the basic parts of the plant and being used as growing materials. A big seed contains a lot of nutrients and the seedling grows accordingly big right from the beginning. After the cotyledons have been developed, it is mostly the light needed for photosynthesis, the temperature and the watering which determine further growth.

Should the seedling suddenly seem to stop growing, it is because the plant is developing its roots more intensely in order to create its base for optimal nutrient supply, which is necessary for your seedlings to grow above ground as well.



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## Plants falling over

The delight created by the first seedlings can wear off very quickly, when the plants suddenly start to fall over without any noticeable reason. Mostly that happens either because the seeds were planted too narrowly and now the roots interfere and hinder each other, or it happens because of warmth, moist soil and high humidity – all the conditions that were actually ideal for propagation at first. To avoid the problem simply keep the soil a bit drier than before, making sure the pot gets some air now and then and / or use a special remedy to strengthen the roots.

## Repotting

Plants should only be repotted after the old pot is completely rooted and has become too small. You will notice this when you have to water the plant more frequently than usual because there is not enough earth in the pot anymore to absorb the water.

Choose a pot that is 2 or 3 sizes bigger than the old one for repotting. For palm trees it would be wise to use a pot that is more high than wide, since the roots of these plants grow deep rather than spread wide. Repotting is usually due every 2 to 3 years with normal growth. Some plants (for example palm trees) may have more sensitive roots than others, so make sure not to cut off too many root springs while repotting and also refrain from giving fertilizer for 2 to 3 weeks afterwards.

## Planting out

With plants that can later be kept in even cooler climate areas, you should consider taking a few safety precautions for successful cultivation. Young plants that were cultivated indoors need preparation time to become stronger before they can be planted out. At first you can keep your plant for about a week in a wind-sheltered, shady, but bright place, so that it can become accustomed to the outdoor conditions. By doing so, your plant will become stronger and develop a thicker protective cuticular layer of its leaves, which also makes it more resilient to the higher UV radiation outdoors. If you transplant directly from indoors to out into the open, you must expect your plant to take UV radiation damage in its leaves and sometimes even the stem – it might get sunburn so to speak.



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Additionally, you should move your plant indoors overnight for the first couple of days, in case the temperature should sink below 8°Celsius.

## Nutrient supply / Fertilizing

A very important part of cultivating a plant is fertilizing. Above all, when your plants don't grow as nicely as expected or the blossoming is rather weak, it is most likely due to lack of nutrients. Particularly fast-growing and lush plants need plenty of special nutrition.

We always recommend fluid fertilizer as the best form of care since the plant can absorb the nutrients almost instantly and the watering ensures a better proportioned distribution than by using granulated fertilizer.

Fluid fertilizer contains a balanced ratio of minerals, and you can see that it is made of dissolved salts when the fluid dries into the soil. Most important for your plants are the minerals that contain nitrogen (N), phosphorus (P) and potassium (K) – a combination that is commonly known as NPK-fertilizer.

The content ratio of these main components is usually stated in percentages. The minerals are absorbed by the plants together with the water and used in combination with the basic substances from the photosynthesis to build various compounds that ensure a healthy growth.

A sufficient supply of nutrients is mandatory to cultivate a healthy plant. Therefore, we advise that you follow the instructions on the packages of our seeds and fertilize accordingly. Without fertilizing the plants, symptoms of the deficiencies in nutrient-poor soil appear rather quickly. A nitrogen deficiency, for example, can be noticed especially in older leaves that lose their strong green colouring and start to turn yellow.

Since nutritional needs are different from plant to plant, general fertilizers, such as common fertilizer for tub plants, as well as specialized fertilizers, are available.

**Fertilizer for tub plants:** Plants in tubs and pots demand an especially high nutrient supply since the nutrients in pots are used up much faster than in the garden bed. Sufficient fertilizing is, therefore, necessary to ensure a lavish flower formation and healthy growth.

**Fertilizer for palm trees:** Palm tree lovers like to see their plants grow quickly. To develop new leaves, blooms and roots the palm tree has a heightened demand for nutrients. By using fluid fertilizer, a fast supply all the way to the roots through the water is guaranteed.

**Iron fertilizer:** If you notice a yellowish-white colouring of the leaves (chlorides), it is due to an iron deficiency. That means that the plant doesn't have enough iron which is necessary to create chlorophyll. Iron fertilizer is a very effective fluid fertilizer with a good plant compatibility.

**Fertilizer for conifers and mammoth trees:** There is a special fluid fertilizer for sequoia, coastal, redwood, araucaria etc. Its nutrients are helpful in avoiding brown needles. The fertilizer is immediately effective in the roots and needles, and it is especially helpful while transplanting / replanting in spring and autumn.

## Hibernation

During hibernation it is important that your plant stays free of fertilizer and also gets less water than usual.

Some species shed their foliage and can be kept in a cool and darker place. Other plants do need some light and warmth. However, the main thing with all plants is that you don't want them to grow during the winter in order to avoid their developing weak sprouts that will most likely die off. Even typical plants that would thrive in their natural habitat throughout the year will stop growing in a different climate area where there is less light and lower temperatures in the wintertime.

## Plant protection / Pest management

Most pests, such as the white fly, spider mites, red spider, aphids, scale insects.... occur due to dry air in the room. Sufficient airing and / or regularly water-spraying of your plant with lime-deficient water to create a higher humidity will certainly help with these pest infestations.

There are also a few species that are simply avoided by pests or throw them off, such as the Apple of Peru, for example. You can place this kind of plant between the others.

With fast-growing plants, you can also get rid of persistent pests by cutting your plant back. It will grow again, and you can save the trouble of fighting the infestation with pesticides.

### Prevention is better than cure!

You can spray the leaves and the soil, for example, with a swill made of plants. To do so, you should place 100g of fresh random herbs in 1 litre of water and leave it sit for 24 hours. After that, you should boil it up for half an hour, let it cool and then run it through a sieve. The swill can now be diluted with 2 litres of water and poured into a water-sprayer, allowing you to protect your green and blooming favorite plants quite effectively.



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## Why the green thumb needs time and experience

Mother nature is generally wasteful with the amount of seeds produced in a year. If all seeds were to germinate, the planet would be overgrown in a short period of time.

That enormous amount of seeds comes from the fact that there are only a small number of seeds that, due to various reasons, actually germinate successfully and become strong plants.

By optimizing the propagation conditions and making use of some helpful tips, we all can try to increase the success rate marginally, but even that doesn't guarantee a 100% germination rate and sometimes it happens that there are no seedlings coming up at all.

Gardening experts know that the way to developing a green thumb comes with many failures. Don't get discouraged by this and try out other different methods of cultivating plants to become more successful with propagation.

In the following we summarized the most common obstacles that delay your success or make it harder to reach. The word "too" is thereby of great significance. How exactly can you define too moist or too dry? You can't! That's precisely the point. It's the experience that counts and experience grows just like your seedlings.

### Obstacles

- If the cultivation soil is too wet, the seeds start to rot.
- If the cultivation soil is too dry – even for a short time – the germination process stops and many seeds don't carry on even if you moisten the soil again.
- The temperature recommendations we give are based on experience. However, the seeds react individually and are often more sensitive to temperature fluctuations.
- The estimated time for the germination we give is an experience-based average and shouldn't be taken too much into account. Even in nature there are sometimes long delays and it is possible that your seedling will come up much later than expected.
- It is also possible that the germination rates that we get from our suppliers don't match the actual success rate, but we always strive to rule that out by taking samples.

**Your SAFLAX Team wishes you great success and much experience on the way to achieving a green thumb!**