

ROOT!T[®]

A Guide to Successful Propagation



propagateplants.com



ROOT!T

If you are one of those people who are unfamiliar with the propagation of plants, then the growing of a plant from seed or cutting may seem a daunting prospect. However, with the availability of new products from **ROOT!T** and by following these simple guidelines, you can grow your favourite plants with ease, confidence and success.



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How to take cuttings

Introduction

Taking cuttings to generate new plants has several advantages. Firstly, the cuttings will have identical characteristics to the donor (mother) plant. They share what is good about your donor plant and also what is bad, so choose wisely. If you have a nutrient imbalance in the donor plant this will show up very rapidly in the cutting, which in it's early days relies on it's own reserves to grow before it develops a root system of it's own.

The plants will also grow to a similar shape and size, so space can be used more efficiently. A further benefit is that once the initial outlay has been made for a specimen plant or seeds, new plants can be grown for minimal cost.

Take care...

Taking successful cuttings requires cleanliness, warmth, healthy stock and a little care. Cuttings are sensitive to their environment and harsh conditions (i.e. cold and damp) will delay rooting and increase failure rates and disease.



Which medium should I use?

ROOT!T Natural Rooting Sponge is an excellent growing medium for taking cuttings. Easy to use, with great aeration properties, **ROOT!T Natural Rooting Sponge** grown plants can be transplanted into any system with minimum transplant shock. **ROOT!T Natural Rooting Sponges** are an environmentally friendly product, which are biodegradable!

They are made from composted organic materials, which are held together using a special water based polymer that ensures just the right amount of moisture is maintained.



Top Tip: To give your cuttings a head start, pre-soak your growing media with **ROOT!T First Feed**. This will aid germination and root growth.

How many cuttings should I take?

There will always be natural differences between cuttings. Sheer numbers will compensate for poor performers and failures. The fastest rooting cuttings have the most vigorous vegetative growth and usually the best flowering potential. We suggest taking 50% more cuttings than you require.

Label your cuttings!

Labelling your donor plant and the cuttings taken (with dates too) is a good idea, enabling you to backtrack to 'the perfect plant'.

Be prepared!

Exposed cuttings will wilt within a few minutes, so it is best to have all materials ready before you start and don't leave them lying around on a worktop before planting on.

First, gather all of the required equipment together. Make sure that everything is clean and sterile (including your hands!). If unsure, wash all of your equipment and rinse everything thoroughly and leave to dry. Choose the donor plant and select the cuttings you wish to take.

Select a donor plant carefully!

In order to have a continuous source of cuttings, you will need to maintain a donor plant from which to take them. As the cuttings will have the same characteristics as the donor plant, it is important to select the donor plant with care.

Desirable characteristics are:

- ✓ Short compact growth (short internodes) in some species
- ✓ Good growth or large, heavy flowers or fruit (depending on crop)
- ✓ Reasonable flowering period
- ✓ Good disease and insect resistance
- ✓ Good taste and/or smell, bloom/flower, colours/shades
- ✓ General good health, glossy green leaves and thick cuticles

Ensure regular feeding of the donor plant, but not over-feeding as too much nutrient (especially Nitrogen) will cause an imbalance in the plant, leading to soft cuttings with little energy reserves for rooting.

The donor plant should be mature before cuttings are taken from it. This ensures that the donor plant has a well developed root-ball.

Ideally, you should water the donor plant 24 hours before you take your cuttings, which ideally should be done within the first hour of the light period (daylight).

The donor plant can also be sprayed with **ROOT!T Cutting Mist** to help prepare it.

Never remove more than 20%-30% of the plant at any one time. Taking cuttings will stress the plant and temporarily stunt its growth, the plant should then be left to continue growing for another four weeks before more cuttings are taken, to allow it to fully recover and form new growth.

It should be noted that once a cutting has been taken, the cut stem may branch into two new growths. This will make the donor plant much bushier, which has the advantage of reducing its height and creating more potential cuttings. However, it may result in a decline in the quality of the cuttings. If this occurs, a new donor plant should be allowed to develop.

What you need



Why not purchase a **ROOT!T Propagation Kit**? The **ROOT!T Propagation Kit** contains all the necessary components to get you propagating quickly and effectively.

Or why not make your own kit from **ROOT!T's** extensive range of high quality propagating products.

Shopping List,

see page 36 onwards

- ✓ **ROOT!T Rooting Gel**
- ✓ **ROOT!T First Feed**
- ✓ **ROOT!T Natural Rooting Sponges**
- ✓ **ROOT!T Cutting Mist**
- ✓ **ROOT!T Propagator**
- ✓ **ROOT!T T5 Light System**
- ✓ **ROOT!T Heat Mats**



The method

Sterilise everything that's going to be used, including the table/cutting mat surface.

If using **ROOT!T Natural Rooting Sponge...**

Soak the **ROOT!T Natural Rooting Sponge** in water immediately prior to use, ensuring any excess moisture/water is squeezed out prior to planting the cutting. Add **ROOT!T First Feed** to your water to give your cuttings a head start.

If using **compost in a tray or pot...**

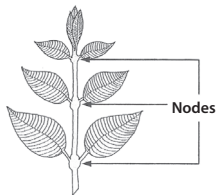
Use free draining compost that is moist, but not too wet. You can add a mix of perlite to aid drainage. Create small dibble holes in the top of the compost that can take **ROOT!T Rooting Gel**. Water your compost lightly with added **ROOT!T First Feed** to give your plants a head start.

Selecting the cutting

Although any part of a plant can be used to make a cutting, some parts will take longer to develop roots than others. The main head or side stems have the highest concentration of natural growth hormones (auxins) and are therefore more likely to root. Cuttings should be made from softwood stems and not the older, harder stems. 'Softwood' is the term which refers to the younger, soft, green stems, these are the easiest to root. Once these stems mature and age, they are then known as 'semi-ripe' and when fully mature 'hardwood'.



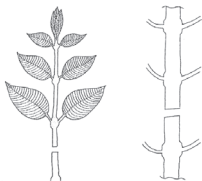
Choose stems that are healthy and have at least three sets of nodes - Smaller cuttings will root but they can be more difficult and may take longer. With most plants, the ideal cutting length is around 5-8 cm. You need to select the part of the stem that has an equal amount of carbohydrates and nitrogen. To do this, simply take a tip and bend it where you would have cut. If it bends or partly snaps into a sharp 'V' then it is ok. If it snaps then the cutting is too woody. If it bends into a rounded 'U', then the cutting is too soft.



Making the cut

Now you have identified which tips to cut, use a tool with a very sharp blade to make the cut. Use a scalpel for example, as you do not want to crush the tissue when cutting. The blade should be sterilized to prevent contamination by bacteria, etc. Clean new blades to remove any grease, etc.

In most cases make a straight cut below the nodes, leaving a good section of stem underneath. A straight cut will heal over quicker than an angled cut thus reducing chances of disease. Exceptions to this are on plants, such as roses, that need to absorb large amounts of water to aid rooting.



Select as thick a stem as possible as thin cuttings can take longer to root. To make it easier, use a scalpel with a small piece of wood behind the stem to serve as an anvil for making a clean cut. If you are taking several cuttings at once, or if there will be a time delay between cutting and planting, take a larger cutting than is initially needed and make the final cut later.

Select cutting

Make the first cut

Make final cut later



Cuttings should be left sitting upright in water so that air does not get to the cut surface. Use a pair of scissors for the first cut, as the opposing blades will 'seal' the end. Make the final cut with a sharp blade, this leaves an open cut which allows roots to develop.



**Cut made with
scissors seals
the end**



**Cut made with a
sharp blade aids
rooting**

Removing the lower leaves

The larger, lower leaves should be removed, so the cutting does not have to expend energy maintaining them. They will probably die anyway. At least the top two sets of leaves must be left. It is preferable (if possible) to remove leaves before making the cut, to avoid embolisms. An embolism occurs when a small bubble of air is sucked up into the stem, preventing the cutting from drawing up the water and nutrients that it needs. This will also allow you to plant the cutting as soon as possible after it has been taken from the donor plant.



ROOTING GEL application

For optimum rooting results, it is important that your growing media or plugs are pre-soaked with water and **ROOT!T First Feed, set up with dibble holes filled with **ROOT!T Rooting Gel** and are ready to accept the cuttings as soon as possible, after the cut has been made.**

Cuttings should be put straight into the growing medium to keep the auxins flowing down the stem and limiting air getting to the open, cut end. Exposure to the air can cause an embolism and is a common cause of cuttings failing to root.

ROOTIT Rooting Gel helps the cutting to establish by:

- ✓ Sealing the cut tissue
- ✓ Protecting initial root tissues
- ✓ Protecting against disease
- ✓ Feeding young roots

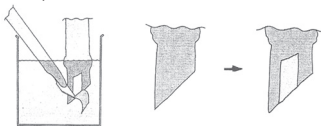
Once the cut has been made, a callous (basal swelling) will form. This is the plant's way of healing the wound. The roots will then grow from this callous. Make sure you apply enough rooting gel to the dibble hole to completely cover the base of the cutting and that there is no air around the base of the cutting. The rooting gel

should spill out of the growing media and form a small mound on the surface.



Scoring

Some gardeners use a technique called 'scoring' to encourage the process of root development. The cutting is submerged in lukewarm water and a small section is removed from the outside. This exposes the cambium layer so that the cells on the surface will change into rooting cells quicker. Be careful not to remove too much, just the outer layer.

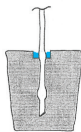


Plant the cutting

Place the cutting (as quickly as possible) into your rooting medium.

Plant until the nodes of the removed lower leaves are level with the media surface, making sure that rooting gel is seen all around the base. These exposed nodes have a high concentration of potential root cells and this will create two more sites from which roots may develop. Make sure the pilot hole is large enough for your cutting and use plenty of **ROOT!T Rooting Gel**. Cuttings should always remain vertical, so that the plant's natural rooting hormones can easily make their way down to the cut stem.

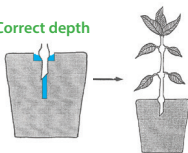
Too deep



Too shallow



Correct depth



Transfer to a propagator

The cuttings should now be transferred to a propagator. A low-level continuous heat is preferred. In summer, a greenhouse or windowsill will be adequate. If growing in the colder months, some controlled heat and light may be required, together with more frequent watering as the heat will dry out the cuttings quickly. Leave the plugs or growing media in the high humidity of the propagator at around 22 °C.



In many plants, temperatures above 24 °C can inhibit rooting and increase the likelihood of damping-off.

The plugs or growing media should NOT sit in water. As long as the humidity is high, you can spray with water twice a day for the first 2 days, then once a day until roots develop.

Alternatively, spray daily with **ROOT!T Cutting Mist** for the first few days to give the cutting the best possible start.

The humidity must be high (>90%) you should see condensation inside the propagator and maybe on the leaves. The propagator lid should be left on for 2 days with the vents closed and lifted daily to provide an air exchange.

When using a hydroponic misting rooting chamber, if your cuttings are being misted from the base to induce rooting and no foliage misting or humidity is applied, then we recommend making an angled cut on the stem as this will help increase the amount of water absorbed through the cutting to help induce rooting.

Lighting

If using lighting, go for energy efficient fluorescent lighting, such as the **ROOT!T T5 Light System**. Unrooted cuttings require low light levels, do not blast them with direct HID (High Intensity Discharge) lights! A **ROOT!T T5** placed 30cm from the plants is ideal.



Progression and hardening-off



Day 1

Initially the cuttings may wilt slightly, but should remain green and healthy.



Day 2

Your cuttings should now be picking up. Although the leaves may still wilt, the tip of the cutting should now be moving towards the light.



Day 3

By now they should be standing upright with the leaves starting to lift towards the light. Open the propagator lid vents to acclimatise them (if wilting occurs, leave vents closed for another day and try again). Keep in mind that the longer you have humid conditions, the more likely the cutting is to develop mould or fungal problems.

Day 4 +

Now they should be looking healthy and the leaves should be arching towards the light. Leave the propagator vents open. These first four days are the most crucial. If after this time the cutting is still wilting, then something is probably wrong (possibly an embolism or the base not being in contact with the rooting gel). If several plants are



wilting, then the problem is probably environmental.

Check the following:

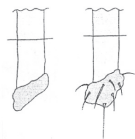
- ✓ Make sure the rooting medium is not too wet or dry.
- ✓ Make sure the humidity is around 80%-90%.
- ✓ Make sure the temperature is around 22°C.

If after four days to a week the cutting is still wilting then carefully check the growing medium for any roots, if none have grown they will need to be re-cut.

- ✓ Remove from the growing medium as carefully as possible.
- ✓ Re-cut the stem at a 45 degree angle.
- ✓ Re-apply rooting gel to the dibble hole in new growing media.
- ✓ Replace into new growing medium as soon as possible.

Days 4-7

Little really happens above ground in the first week, but below ground the division of cells at the cut stem will have an initiated basal swelling from which the roots will develop.



Week 2

In the second week, there should be observable development. The cuttings should have developed roots and have started feeding, with initial sprouting of new growth above ground. Do not worry if the lower leaves turn yellow or brown - this is a good indication that the roots are growing; however, if they look burnt at the edges, the roots may not be developing correctly.



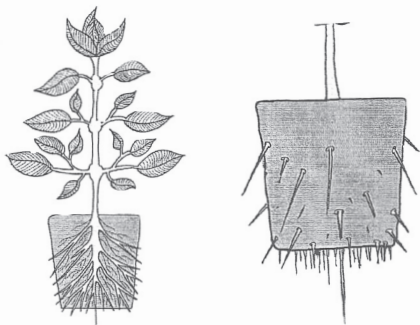
Please note that hardwood cuttings can take a lot longer to root.

When you first see that the cuttings are rooting through the bottom of the growing media or plug, you can start watering them. Adding a weak nutrient solution is recommended at this point, use **ROOT!T First Feed**. Let the solution drain from the plugs or growing media. If you have some cuttings rooted and some not, continue with the humid condition for a couple of more days.

Roots should be white and fuzzy, brown roots indicate rot.

Week 3-5

By now the initial roots should be seen protruding from the rooting medium and new leaf growth should be occurring. Once the cuttings have fully established roots, they can be transplanted and either kept under low intensity lighting (**ROOT!T T5 Light system**) or moved to weak HID (High Intensity Discharge) lighting and a half strength nutrient regime in a hydroponic/aeroponic propagating system, or be potted on in a greenhouse or on a windowsill or planted into soil.



Please remember to add an intermediate potting-on stage if planting into large containers. Do not simply plant your rooted cutting into a 15 litre container, as it will be harder to keep control of the environment around your cuttings. Plant out first in something like a 13cm/1 litre pot as it will gain root volume quicker and there is less risk of over-watering.



ROOT!T First Feed should continue to be fed to rooted cuttings for the first 3 weeks, watering is advised "little but often".

**POT ON
INTO SOIL**



**POT ON INTO
HYDROPONICS**



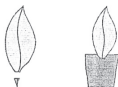
Other methods of taking cuttings

Softwood stem cuttings can be taken from most plants. However, some plants require other methods of propagation.

Leaf cuttings

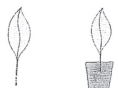
Whole Leaf

Take a mature healthy leaf, cut off the stalk tip, place into the rooting medium pre-filled with **ROOT!T Rooting Gel**.



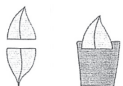
Leaf and Stalk

Take a leaf with a long stem and cut about 4 cm down, place into the rooting medium pre-filled with **ROOT!T Rooting Gel**.



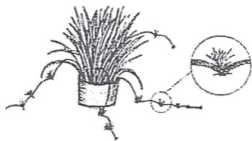
Leaf Segment

Cut the leaf into a triangle (or even several sections), place into the rooting medium pre-filled with **ROOT!T Rooting Gel**.



Offsets

Off-sets are miniature plants that develop from off-shoots from the donor plant. A commonly known example of this is the spider plant or strawberry runner. Off-sets can simply be removed and placed straight into the rooting medium. If it does not have any aerial roots showing, leave it to soak for 24 hours prior to planting. Pre-soaking the growing media in **ROOT!T First Feed** will give the plant a head start.



Division

Division is the simplest method of producing new plants. Some plants, such as ferns, have multiple crowns. The donor plant can be split apart to create several new plants.



Air layering

This technique is only recommended for propagating the rarest or most exotic plants. It can also be used to reduce the height of plants that have become too leggy.

Remove a 1½ cm segment from the outer layer of the stalk about 30 cms from the top of the plant. (Fig. 1) With smaller plants, a small inclusion can be made (Fig. 2).

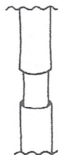


Fig. 1



Fig. 2

Step 1: Cover the wound with sphagnum moss (or vermiculite, peat moss, etc.) and bind with cotton/string.



Step 2: Cover with clear plastic or polythene and bind at both ends, but only enough to retain.



Step 3: After a few months, roots will have developed and should be visible through the plastic. Remove the plastic and with a clean, sharp tool cut just below the roots. Carefully plant the top part into a rooting medium and allow the lower half to continue to grow as before.



How to propagate from seed

Introduction

An alternative to growing plants from cuttings is to propagate from seed.

Take care!

Propagating successfully from seed requires cleanliness, warmth, quality seeds and a little care. Seedlings are sensitive to their environment and harsh conditions (i.e. cold and damp), will delay development and increase mortality and failure rates

Which medium should I use?

ROOT!T Natural Rooting Sponge is an excellent medium for seed propagation, it is easy-to-use, with great aeration properties that aid germination. **ROOT!T Natural Rooting Sponge**-grown plants can be transplanted into any system with minimum transplant shock. **ROOT!T Natural Rooting Sponge** is a natural environmentally friendly product which is biodegradable! They are made from composted organic materials, which are held together using a special water-based polymer that ensures just the right amount of moisture is maintained.

Sowing directly into pots or outside in a grow bed is also possible, but the soil temperature needs to be right for germination to occur.



Top Tip: To give your seedlings a head start, pre-soak your growing media with **ROOT!T First Feed**. This will aid in germination and root growth.

How many seeds should I plant?

There will always be natural differences between seeds, sheer numbers will compensate for poor performers and failures. The fastest germinating seeds have the most vigorous vegetative growth and usually the best flowering potential. We suggest planting more seeds than you require.

Label your seedlings!

Labelling and dating your seedlings and propagation media is a good idea to be able to backtrack to a good seed source or plant variety.

How can I increase the germination rates of my seeds?

For germination the seed requires air, water, warmth and in some cases light. Some seeds have a built-in natural trigger that aids in controlling the time of germination. Rather than allowing the seed to germinate at just any old time, the trigger keeps the seeds dormant until conditions are favourable. This dormancy can be achieved in several ways - the seed may have a hard coat that must rot or be broken before germination can take place, there may be chemical inhibitors present in the seed, or the seed may have to experience alternating cold and warm periods.

'Scarification' is a method used to breach the seed with a hardened seed coat and thereby allows water to enter, which in turn speeds up germination. Small seed with hardened coats are best shaken in a jar lined with coarse sand paper, whereas large seed can have their skin cut with a knife. Some hard seed may also be steeped in tepid water for 24 hours before sowing - for example, the canna or sweet-pea.

Steeping (pre-soaking) your seed before planting them is a terrific way to ensure a greater germination percentage and faster germination rates. There are a few different methods of soaking seeds. The two most popular being the 'Paper-Towel Method'

(where you place the seeds between the sheets of a paper towel dampened with water only) and the 'Standard Method' (soaking in a cup or similar). Both methods yield similar results if done correctly (tap root emerges in approximately 24 hours).



There is also a product on the market called **HALO**, which has beneficial effects on growth and plant yield when seeds or tubers, such as potatoes, are pre-soaked in a **HALO** solution.

NOTE: For the best results, regardless of which method you use, soak seeds in a dark warm environment. Once the tap root (tiny white root-tip) emerges from the seeds, they are ready to be planted into the propagation medium.



What you need



Why not purchase a **ROOT!T Propagation Kit**? The **ROOT!T Propagation Kit** contains all the necessary components to get you propagating quickly and effectively.

Or why not make your own kit from **ROOT!T**'s extensive range of high quality propagating products.



Shopping List,

see page 36 onwards

- ✓ **ROOT!T First Feed**
- ✓ **ROOT!T Natural Rooting Sponges**
- ✓ **ROOT!T Propagator**
- ✓ **ROOT!T T5 Light System**
- ✓ **ROOT!T Heat Mats**
- ✓ Mix **ROOT!T First Feed** with beneficial bacteria like **VitaLink BioPlus** for increased root growth

The method

Sterilise everything that's going to be used in planting the seed.

If using the ROOT!T Natural Rooting Sponge 24 Cell Tray...

Pre-soak the plugs with water, ensuring any excess moisture/water is squeezed out prior to seeding. Add **ROOT!T First Feed** to your water to aid germination and give your seedlings a head start. The drip tray supplied with the 24 cell insert can also be used as a germination lid - simply place over seeded plugs to encourage sprouting and check every day.

If using compost in a tray or pot...

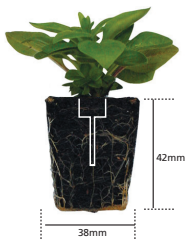
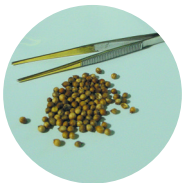
Use free draining compost that is moist, but not too wet. You can add a mix of perlite to aid drainage or a mix of vermiculite to aid water retention. Add **ROOT!T First Feed** to your compost to give your plants a head start.

Make sure that all the pots and trays to be used are spotlessly clean and sterilised. Fill the pot or tray with moistened sowing compost and then firm it down lightly (always remember to moisten the compost thoroughly before sowing). Level off the top of the compost and once again firm it down lightly.

Sowing your seed

For larger seeds use tweezers to place the seeds (pre-soaked or not) into your chosen growing media. Sowing fine seed evenly can be quite difficult. The easiest way is to take a piece of paper and fold it in half, tip the seed into the fold and gently tap the paper thus scattering the seed lightly and evenly.

There are many schools of thought on the depth that provides optimum results, but 3-5mm (or $1\frac{1}{2}$ times the seed's diameter) is generally accepted as best, but some people prefer slightly deeper. Consider this - the seed only carries a certain amount of 'fuel', so placing it too deep may cause the seed to fail in its attempt to break the surface of the plug. Orientation is also a factor. Good seeds are always pretty regular in their shape. For best results, place the seed with either the crack or the 'pointy end' down. This allows the seed to use minimal amount of energy orientating itself and also reduces the risk of the seedcase becoming stuck while trying to push free. Remember, **ROOT!T Natural Rooting Sponge** is designed with a special planting hole at the ideal depth for seeds.



If using potting soil in a pot or tray - with dry hands, take a small amount of seed in the palm of one hand and gently tap with the other, so distributing the seed evenly over the compost surface. For larger seeds, make holes using a stick or dibber and place the seeds into the holes. Once sown, all except most fine seed need to be covered. To avoid dislodging the seeds when covering them, either use a sieve to gently shake a fine layer of compost over them or cover the seeds with a layer of vermiculite.

Each seed needs plenty of room to develop in its early stages. This space is especially important when sowing in the greenhouse or a frame. With a humid atmosphere and too dense a sowing, you are providing ideal conditions for fungal attacks, especially damping-off.

As a general rule, the majority of seed are best sown the year after harvesting; however, a few may remain viable for two, five or even seven years and in the case of melon seed, up to fifteen years, though this is quite rare.

Indoor seedling management

After sowing the seed, place in a **ROOT!T Propagator** with the vents closed, cover the pot with glass or clingfilm. This covering will help conserve moisture, maintain a constant low-level continuous heat and exclude draughts. In summer, a greenhouse or windowsill will be adequate to site your propagator. If growing in the colder months, some controlled heat may be required at around 18-22°C from either a **ROOT!T Heat Mat**, heated propagator or in an airing cupboard or warm room with a **ROOT!T T5 Light System**.



From time to time, remove the covering and wipe over with a cloth, this will prevent the build-up of excessive condensation and allow full light to reach the seedlings.

Some seeds require darkness to germinate and for this the **ROOT!T 24 Cell Propagation Tray** comes with a germination lid that you can place loosely over the seeded plug, then when germinated, place underneath as a drip tray.

Once germinated, open the vents on your propagator, halfway at first, to let them acclimatise then fully open after the second set of leaves have appeared.

The greatest error in the management of seedlings is to over-water them. Thorough drainage of seed trays, pots and boxes is essential in order to achieve strong, healthy seedlings as the end result. The general rule is that the seedlings should not be allowed to dry out, but should also not become too waterlogged. For example, water the **ROOT!T Natural Rooting Sponge** evenly until you see water appear at the base of the sponge, continue until all sponges are

watered. The seeds will take between 24 hours to 10 days to protrude from the sponges, with around 3-5 days being the norm. Adding a weak nutrient solution is recommended at this point.

We recommend using **ROOT!T First Feed**.

Let the solution drain from the sponges.

Provide plenty of natural light - without it the seedlings will soon become pale and leggy. If you are growing seedlings on a windowsill, remember to turn the container regularly, otherwise you will have seedlings that are leaning as they grow towards the light.

If light levels are low, or you want to get a head start early in the season then you can use a horticultural grow light. We recommend the **ROOT!T T5 Light System** which has the ideal light levels required and is cheap to run. Once lighting is set up you need to ensure a stable temperature, 22°C is the ideal temperature for germination and propagation. Try using a **ROOT!T Heat Mat**.

Air is another essential requirement in the management of seedlings. If damping-off and spindly growth are to be avoided then ensure that there is adequate ventilation. Once the seedlings are large enough to handle, early pricking out or planting into growing systems or outside grow beds is advisable. If sown in a pot, loosen the compost gently by knocking the container against the table and then remove both seedlings and compost intact, sliding them out onto a work top. Take the seedling by the leaves and using a pencil or dibber, carefully separate each seedling, retaining a little compost around the roots and transplant the seedling into a ready prepared cell tray or larger pot. Firm the soil around the seedling and water. If you are using larger seeds and have two sown seeds to a pot, once one of the seedlings has reached a height of 5-7cm, remove the smaller seedling, leaving



the stronger to grow on.

The seedlings are ready to be potted out into your desired system or potted on into larger pots before going outside when they have developed 3 to 4 sets of leaves.

In preparation for planting outdoors the plants will need to be 'hardened' off. This is a process that may take two to three weeks. If your seedlings have been grown in the protective environment of a propagator, greenhouse or the warmth of a windowsill, they will need to be moved to a cold frame. At first, the frame should remain closed. Then, during daylight, open the lid of the frame for increasingly long periods.

Continue this process until you can leave the lid open for both day and night. Once this has been achieved, the young plants can be planted outdoors.

If sowing directly under a cloche outside, keep the cloche over the plant until established, then start to remove from the plant in the day, but replace at night to aid hardening off.

Sowing seed outdoors

Sowing depths and distances are usually suggested on the back of seed packets or in any good gardening book. As a general rule, remember that most seed will not germinate until the soil has warmed above 7°C.

Care of outdoor seedlings

The care of outdoor seedlings is basically the same as indoor seedlings. The seeds should of course be thinly sown onto a well prepared seed-bed positioned in a part of the plot that has a lightly shaded area. The watering of seedlings outdoors should not be done in the heat of the day. To avoid the soil being washed away from the seedlings when watering, use a fine spray head on the hose or a fine rose head on the watering can. Lukewarm water is preferable to cold water.

As with indoor seedlings, it will be necessary to thin out the seedlings in order to prevent overcrowding. Water the row of seedlings the day before you intend to transplant them, firming down the soil at the base of those that are to remain in situ. Next day, carefully remove those to be transplanted and gently replant them into new rows. Water the seedlings

using a fine spray. At all times keep the seedling bed clear of any weeds and anticipate attacks from slugs and snails.

Add **ROOT!T First Feed** to your water to give your plants a head start.



ROOT!T®

Seed Sow

SOW IN GENTLE HEAT / GREENHOUSE

SOW UNDER CLOCHES / GLASS

SOW OUTDOORS / UNHEATED

JAN

FEB

MAR

APR

BROAD BEANS

RUNNER BEANS

BEETROOT

CARROT- EARLY OUTDOORS

CABBAGE

CAULIFLOWER

COURGETTE

CUCUMBER GREENHOUSE

LETTUCE (SUMMER/AUTUMN)

LETTUCE (WINTER GREENHOUSE)

LETTUCE (SPRING)

PARSLEY

PEAS

PEPPER (INDOOR)

ROCKET

STRAWBERRY

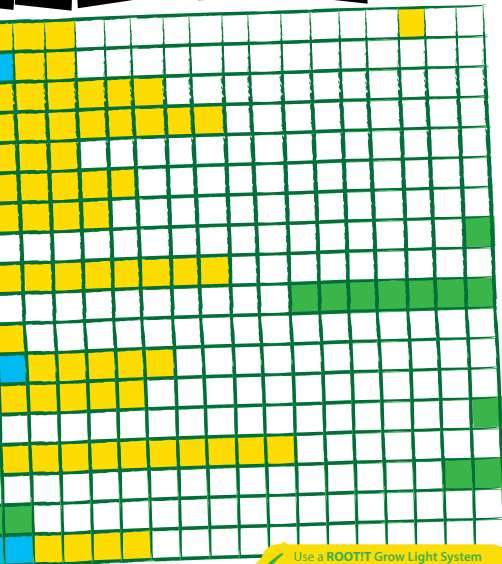
TOMATO GREENHOUSE

TOMATO OUTDOORS

	JAN	FEB	MAR	APR
BROAD BEANS			OUTDOORS	OUTDOORS
RUNNER BEANS			INDOOR	INDOOR
BEETROOT			INDOOR	INDOOR
CARROT- EARLY OUTDOORS	INDOOR	OUTDOORS	OUTDOORS	OUTDOORS
CABBAGE		INDOOR	INDOOR	INDOOR
CAULIFLOWER	INDOOR	INDOOR	INDOOR	INDOOR
COURGETTE				INDOOR
CUCUMBER GREENHOUSE	INDOOR	INDOOR	INDOOR	INDOOR
LETTUCE (SUMMER/AUTUMN)				INDOOR
LETTUCE (WINTER GREENHOUSE)	INDOOR	INDOOR		
LETTUCE (SPRING)			OUTDOORS	OUTDOORS
PARSLEY			INDOOR	INDOOR
PEAS			OUTDOORS	OUTDOORS
PEPPER (INDOOR)	INDOOR	INDOOR	INDOOR	INDOOR
ROCKET		OUTDOORS	OUTDOORS	OUTDOORS
STRAWBERRY	INDOOR	INDOOR		
TOMATO GREENHOUSE			INDOOR	INDOOR
TOMATO OUTDOORS			INDOOR	INDOOR

ing Guide

R MAY JUN JUL AUG SEP OCT NOV DEC



Use a **ROOTIT** Grow Light System and you can propagate any time of the year!

ROOT!T

The product range

Advanced products through research

The **ROOT!T** range is the most advanced in propagation and has been developed to help growers get off to a flying start. With our ongoing product development, we constantly look for ways to improve existing products as well as creating new ones. The products are all designed to maximise your success rate and be simple to use.

Reliable performance

We maintain stringent quality control to ensure products perform consistently well. Each batch of liquid product undergoes complete laboratory analysis before shipment.



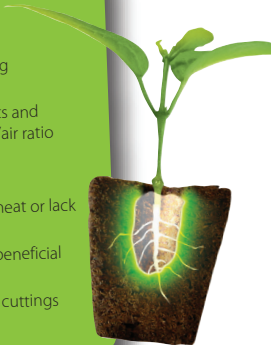
Products available to help you grow..

ROOT!T Natural Rooting Sponges

Most of our kits feature the **ROOT!T** Natural Rooting Sponge, which time after time has demonstrated superior rooting ability. It is nice to handle, clean and compostable after use. It dries from the outside in, so you will see when it is time to water before your plants get stressed. Due to the way it is made, when combined with **ROOT!T** Rooting Gel, it will encourage stronger and healthier root growth on cuttings than any other growing media. What are you waiting for? Give it a try!

ROOT!T Natural Rooting Sponge Benefits:

- ✓ Environmentally friendly and biodegradable
- ✓ Stronger, more vigorous rooting and reduced plant shock
- ✓ Superior absorption of nutrients and easily maintains perfect water/air ratio
- ✓ Improved water retention and reduces transplant losses
- ✓ Insulates roots better against heat or lack of moisture
- ✓ Contains micronutrients and beneficial microbes to aid germination
- ✓ Unique pre-moulded hole for cuttings and seeds



Products available to help you grow..

ROOT!T Propagation Kit

The kit comes complete with a medium size propagator, a 24 cell insert and tray, filled with **ROOT!T Natural Rooting Sponges** that offer the fastest rooting available today, a sterile scalpel, **ROOT!T Rooting Gel**, **ROOT!T First Feed** and a booklet on how to grow from cuttings or seeds. The ideal propagation kit!

Size: L:38cm x W:24cm x H:18.5cm

What's inside?

- ✓ High Quality Propagator
- ✓ 24 cell insert with **ROOT!T Natural Rooting Sponges**
- ✓ **ROOT!T First Feed**
- ✓ **ROOT!T Rooting Gel**
- ✓ Sterilised Scalpel
- ✓ 'How to' guide on achieving great results from your cuttings and seeds





Products available to help you grow..

ROOT!T Windowsill Propagator

Filled with 24 **ROOT!T** Natural Rooting Sponges, this propagator has been designed to fit perfectly onto a windowsill. With its redesigned vents, not only does it look good it is a great way to successfully grow indoors. Included with the **ROOT!T** Windowsill Propagator is **ROOT!T** Rooting Gel and **ROOT!T** First Feed.

Size: L:39.5cm x W:19cm x H:10.5cm

What's inside?

- ✓ Vented propagator lid
- ✓ Propagator base
- ✓ 24 cell insert with **ROOT!T** Natural Rooting Sponges
- ✓ **ROOT!T** First Feed
- ✓ **ROOT!T** Rooting Gel





Products available to help you grow..

ROOT!T Value Propagation Kit

The ideal introduction kit to propagation.

The kit comes complete with a standard seed tray propagator, a 24 cell insert and tray, 24 **ROOT!T** Natural Rooting Sponges that offer the latest and fastest rooting available today. **ROOT!T** Rooting Gel, **ROOT!T** First Feed and a book on how to grow from cuttings or seeds.

Size: L:36cm x W:23.5cm x H:17.5cm



Adjustable Vent



What's inside?

- ✓ Value Propagator
- ✓ 24 cell insert with **ROOT!T** Natural Rooting Sponges
- ✓ **ROOT!T** Rooting Gel
- ✓ **ROOT!T** First Feed
- ✓ 'How to' guide on achieving great results from your cuttings and seeds



Products available to help you grow..

ROOT!T Plugs and Kit Refills

ROOT!T 24 cell filled insert and tray

This insert and tray has been completely redesigned and considered to be the best on the market. Not only is it filled with **ROOT!T Natural Rooting Sponges**, it is tough, durable and does not allow for any pooling. It really does help to grow big every time.

ROOT!T Rooting Sponges 50 refill bag

Maximise your success rate and grow faster, more vigorous roots with **ROOT!T Natural Rooting Sponges** - the latest innovation in propagation. Not only are they simple to use, they are also easy to pot on. This bag of 50 sponges can be used to refill trays or used on their own on a bed of perlite or vermiculite.

The bag is resealable to help ensure that each **ROOT!T Natural Rooting Sponge** is kept in perfect condition.



...and propagate from seed

Products available to help you grow..

ROOT!T Large Propagator

The **ROOT!T** Large Propagator Lid and the **ROOT!T** Large Propagator Tray are not only great value, their lightweight design means that they have many uses. The **ROOT!T** Large Propagator Lid has two vents for humidity control and the whole lid can be used on its own as a large cloche when growing outdoors.

The **ROOT!T** Large Propagator Base has been designed to be large enough to fit a whole tray of Cultilène, Grodan or Jiffy propagation plugs or used with loose growing media as a seed tray/hardening-off tray.

Also available - the **ROOT!T** Propagator Tray Insert for Natural Rooting Sponges, taking 60 sponges.



Adjustable Vents



Propagator Lid

L:57cm x W:37cm x H:15cm
(excluding handle)



Propagator Insert

L:52.5cm x W:32cm x H:5cm



Propagator Base

L:57cm x W:35.5cm x H:5.5cm

Products available to help you grow..

ROOT!T Rooting Gel

ROOT!T Rooting Gel is the first of its kind specifically formulated for use with growing media. **ROOT!T Rooting Gel** helps natural root development of cuttings.

This fantastic product is a gel that stays firm in the plug replacing the need for hormone rooting powder.

ROOT!T Rooting Gel, unlike other rooting gels is placed directly into the central cavity of the plug.

The gel forms a seal around the cut surface of the cutting, aiding uptake and helping prevent dehydration and infection. It will work equally effectively with rooting sponges, peat plugs, coco coir plugs, coco coir fibre or compost.



...and propagate from seed

Products available to help you grow..

ROOT!T Cutting Mist

ROOT!T Cutting Mist is a spray that improves the success rate of cuttings.

Ideal for use on soft and semi-hardwood material, it helps to prevent losses in the critical first few days.

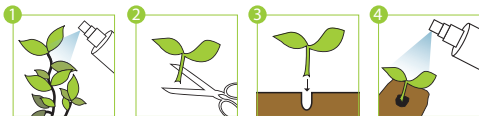
It can be used to pre-treat donor plants 2-3 days before taking a cutting and also, to treat cuttings for the following 3 days.

ROOT!T Cutting Mist is best used with **ROOT!T Rooting Gel**, but can be used with other rooting products or even on its own.

ROOT!T Cutting Mist contains a balanced vitamin and mineral blend to support successful cutting development.



Spray leaves lightly with an even mist until coating is just visible.
Take care not to inhale, - always spray away from you.



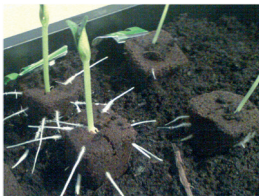
Products available to help you grow..

ROOT!T First Feed

Specially formulated to give young plants the best start in life.

ROOT!T First Feed contains everything required for healthy growing during this crucial stage, including Boron and Calcium for the fastest, healthiest root development.

This highly concentrated liquid feed is incredibly easy to use and is ideally suited for propagation plugs/sponges or transplanter blocks/pots. NPK 2.0/1.15/2.3.*



Here we see 4 plugs, 2 on the left were Pre-soaked in **ROOT!T First Feed** before a seed was placed in the plug. Notice that with **ROOT!T First Feed** there has been rapid root growth compared to normal seeded plugs on the right.

TOP TIP: Commercial growers are having great results from **ROOT!T First Feed** with the addition of 2ml per litre of **VitaLink BioPlus** (a professional feed additive).

*Please note, in accordance with EU labelling legislation, NPK stands for N,P₂O₅ and K₂O

...and propagate from seed

Products available to help you grow..

ROOT!T Stock Plant Tonic

For the strongest, healthiest cuttings

ROOT!T Stock Plant Tonic will make sure your donor plant is at its best to deliver cuttings with vigour.

Overall benefits of using **ROOT!T Stock Plant Tonic**:

- ✓ Maintains strong growth and good health in plants repeatedly used to take cuttings from.
- ✓ Improves and promotes side shoot development.
- ✓ Improves and enhances recovery time of your donor plant.



Products available to help you grow..

ROOT!T Heat Mats & Heat Mat Thermostat Controller

Get a jump start on young plants with the **ROOT!T Heat Mat!**

Adding gentle heat to your plants will speed up germination by days! **ROOT!T Heat Mats** offer more uniform heating than others on the market. The single mesh element is encased in waterproof, fray-proof layers. **ROOT!T Heat Mats** are tough and can withstand rugged greenhouse environments.

A thermostat is also available for these heat mats offering complete temperature control.



Small
25cm x
35cm

Medium
40cm x
60cm

Large
40cm x
120cm

ROOT!T's electronic temperature controller is compatible with all heat mats and is an optional accessory for the ROOT!T Heat Mats.

The thermostat turns the heat mat on and off. To maintain optimum temperatures, use **ROOT!T Heat Mats** with the **ROOT!T Thermostat** giving ultimate temperature control during propagation.

- ✓ Maintain optimum temperatures for specific plants
- ✓ Easy plug-in operation
- ✓ Easy to use and control
- ✓ Temperature control range 20°C to 42°C
- ✓ 2 year warranty



...and propagate from seed

Products available to help you grow..

ROOT!T T5 Light System

Young plants, cuttings and seedlings are delicate and have specific lighting needs compared to established plants. The **ROOT!T T5 Light** has been specifically designed to give your plants the best light they need. Fully adjustable, the **ROOT!T T5 Light** allows you to alter the height of the light, so that it is either closer or further away from the plants to ensure a healthy and robust growth.

Each **ROOT!T T5 Light** is fitted with a high output **ROOT!T T5** full daylight spectrum bulb, that encourages faster growth. These **ROOT!T T5** bulbs are more than twice as efficient than ordinary grow lights, have 20% more light intensity than comparable fluorescent grow lights and are cool running.

Each **ROOT!T T5** provides:

- 2000 initial lumens
- 24 watts 6400K – full daylight spectrum
- 20,000 hour life



ROOT!T T5 Power Lead

Also available – a 2m power lead.

Single Lamp Unit
with Reflector

The **ROOT!T T5 Light** has an independent on/off switch, long power cord, robust design and is able to accommodate the most popular sizes of propagator.

Not only is it simple and easy-to-use, it promotes great plant growth and has low running costs.

ROOT!T T5 Light System dimensions:
L:66.5cm x W:46.5cm x H:62.5cm



Hang or stand

ROOT!T T5 Link Cord

With the ROOT!T T5 Link Cord, you can daisy-chain five of the 122cm (4ft) individual strips together, or ten of the 61cm (2ft) strips; giving a total maximum wattage of 270W.



ROOT!T T5 Light Dock

ROOT!T are offering a T5 Light Dock, which can be used for up to 4 Lamp Systems. It includes four legs (45cm/18" each) and two docking units to create a 61cm or 122cm system.



Simply add the number of ROOT!T Light Strips as you desire and off you grow!

ROOT!T



Visit our website for more exciting products
propagateplants.com



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Manufactured by HydroGarden Wholesale Supplies Ltd,
2 Progress Way, Binley, Coventry, CV3 2NT, UK | www.hydrogarden.com