

ROOT!T™

Successful Propagation Guide



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."



www.propagateplants.com

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How to take cuttings

Introduction

There are several advantages of taking cuttings to generate new plants. 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 your plant 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 its own reserves to grow before it develops a root system of its 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 & 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 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.

Alternatively you could use ROOT!T Expanding Coco Coir Plugs or ROOT!T Expanding Peat Plugs which are compressed growing media that when wetted, expand into a small plug of growing media ready to accept seeds or cuttings. These are very easy to use and provide great results.

You may also consider ROOT!T Stonewool, used mainly in commercial horticulture and hydroponics, which will give you fantastic results but which will need to be pre-soaked in a quarter strength seed nutrient such as ROOT!T First Feed at a pH of 5.5 - 6.5.



Top Tip: To give your cuttings a head start presoak your growing media with ROOT!T First Feed. This will aid in 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 (with dates too) taken from a particular plant is a good idea, to be able 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. 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

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 and then take the cuttings within the first hour of the light period (daylight).

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.

Equipment Needed

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 38

- ✓ ROOT!T Gel4Plugs Rooting Gel
- ✓ ROOT!T First Feed
- ✓ ROOT!T Natural Rooting Sponges
- ✓ ROOT!T Stonewool Plugs
- ✓ ROOT!T Expanding Coco Coir Plugs
- ✓ ROOT!T Expanding Peat Plugs
- ✓ ROOT!T Bell Cloche
- ✓ ROOT!T Propagator
- ✓ ROOT!T Grow Light System
- ✓ ROOT!T Heat Mats
- ✓ You could even post your plants to a friend with the ROOT!T Postal Pack.



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 ROOT!T Stonewool...

Presoak in water at a pH of 5.5-6.5. Use a quarter strength nutrient or ROOT!T First Feed. Make sure the plugs are totally soaked and squeeze to release excess moisture.

If using ROOT!T Expanding Coco Coir Plugs or ROOT!T Expanding Peat Plugs...

Soak the plugs in water until they are fully expanded. Create a small dibble in the top of each one that can take ROOT!T Gel4plugs rooting gel. Add ROOT!T First Feed to your water to give your cuttings a head start.

If using Compost in a tray or pot...

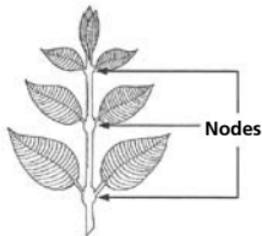
Use free draining compost that is moist but not too wet. You can add a mix of perlite to aid drainage. Create small dibble holes in the top of the compost that can take ROOT!T Gel4plugs rooting gel. Add ROOT!T First Feed to your compost to give your plants a head start.

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 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'.

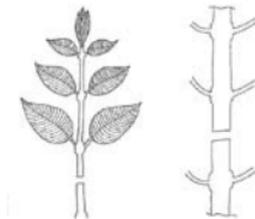


Choose stems that are healthy and have at least three sets of nodes - Smaller cuttings will root but they can be more difficult and may take longer. With most plants the ideal cutting length is around 5-8 cm. You need to select the part of the stem that has an equal amount of carbohydrates and nitrogen, 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 what 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



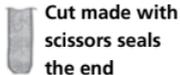
Make the first cut



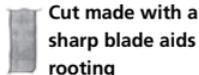
Make final cut later



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.



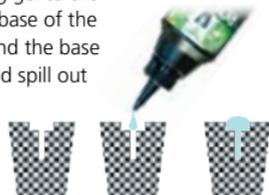
ROOTING GEL application

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 Gel4Plugs 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. ROOT!T Gel4Plugs Rooting Gel help the cutting to establish by:

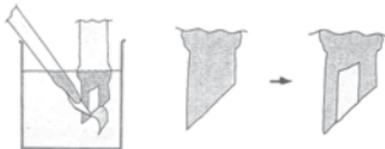
- ✓ Sealing the cut tissue
- ✓ Promoting root cell development
- ✓ Protecting initial root tissues
- ✓ Protecting against disease
- ✓ Feeding young roots

ROOT!T Gel4Plugs Rooting Gel has the advantage over other gels and powders as it will remain in contact with the stem for longer and so is more successful in promoting root development. Once the cut has been made, a callous (basal swelling) will form, this is the plants 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. Avoid simply pre-dipping your cutting in the rooting gel or using additional rooting hormones.



Scoring

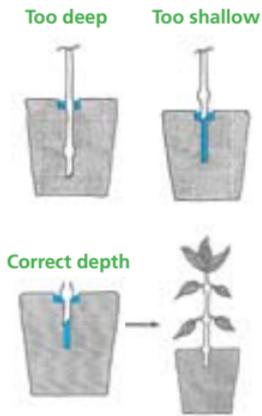
Some gardeners use a technique called 'scoring' to encourage the process of root development. The cutting is submerged in lukewarm water and a small section is removed from the outside. This exposes the cambium layer so that the cells on the surface will change into rooting cells quicker. Be careful 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 plants natural rooting hormones can easily make their way down to the cut stem.



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 will be required. The heat will dry out the cuttings quickly, therefore more frequent watering may be required. Leave the plugs or growing media in the high humidity of the propagator at around 22-25 °C.



The plugs or grow 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.

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 Grow Light System, keeping it on for 24 hours. Unrooted cuttings require low light levels, do not blast them with direct HID (High Intensity Discharge) lights! A ROOT!T Grow Light placed 30cm from the plants is ideal.



Progression And Hardening-Off



Day 1

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

Day 2

Your cuttings should now be picking up. Although the leaves may still wilt, the cutting tip 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 was not in contact with the rooting gel). If several plants are wilting then the problem is probably environmental. Check the following:

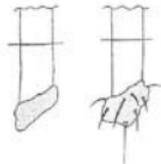
- ✓ Make sure the rooting medium is not too wet or dry
- ✓ Make sure the humidity is around 80%-90%.
- ✓ Make sure the temperature is around 22-25°C.

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.



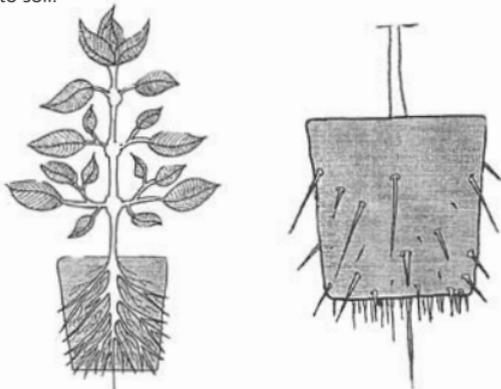
Please note that hardwood cuttings can take a lot longer to root.

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 grow 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.

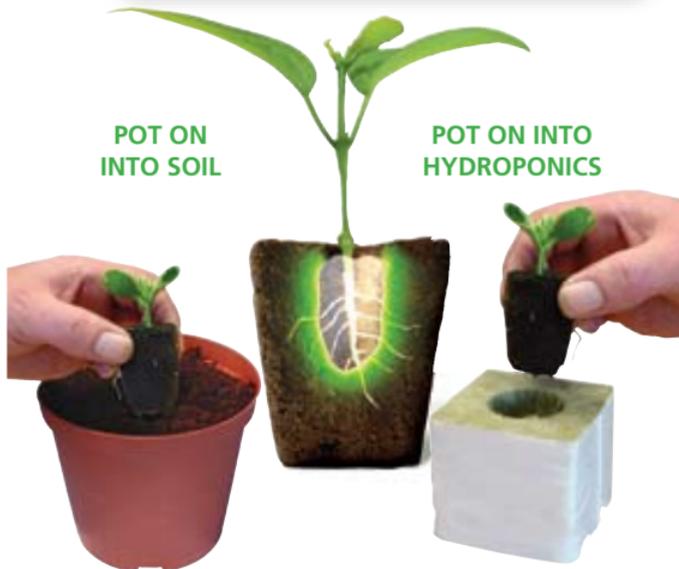
WEEK 3-5

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 Grow 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 more frequently is advised to avoid the exposed root tips drying out.



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

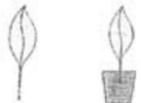
Whole Leaf

Take a mature healthy leaf, cut off the stalk tip, place into the rooting medium prefilled with ROOT!T Gel4Plugs rooting gel.



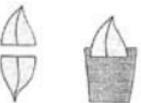
Leaf and Stalk

Take a leaf with a long stem and cut about 4 cm down, place into the rooting medium prefilled with ROOT!T Gel4Plugs rooting gel.



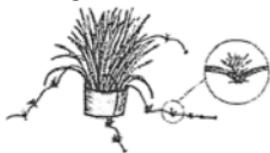
Leaf Segment

Cut the leaf into a triangle (or even several sections), place into the rooting medium prefilled with ROOT!T Gel4Plugs rooting gel.



Offsets

Offsets 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. Offsets 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. Presoaking the growing media in ROOT!T First Feed will give the plant a head start.



Division

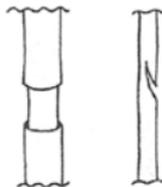
Division is the simplest method of producing new plants. Some plants, such as ferns, have multiple crowns. The donor plant can be split apart to create several new plants.



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 1 1/2 cm segment from the outer layer of the stalk about 30 cms from the top of the plant. With smaller plants a small inclusion can be made.



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



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

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. Alternatively you could use ROOT!T Expanding Coco Coir Plugs or ROOT!T Expanding Peat Plugs which are compressed growing media that when wetted, expand into a small plug of growing media ready to accept seeds or cuttings. These are very easy to use and provide great results.

You may also consider ROOT!T Stonewool, used mainly in commercial horticulture and hydroponics which will give you

fantastic results but which will need to be pre-soaked in a quarter strength seed nutrient such as ROOT!T First Feed at a pH of 5.5 - 6.5.

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.

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,



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

whereas large seed can have their skin cut with a knife. Some hard seed may also be steeped in tepid water for twenty four 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 hrs).

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



Equipment Needed

Why not purchase a ROOTIT Propagation Kit. The ROOTIT Propagation Kit contains all the necessary components to get you propagating quickly and effectively.

Or why not make your own kit from ROOTIT's extensive range of high quality propagating products.



Shopping List, see page 38

- ✓ ROOTIT First Feed
- ✓ ROOTIT Natural Rooting Sponges
- ✓ ROOTIT Stonewool Plugs
- ✓ ROOTIT Expanding Coco Coir Plugs
- ✓ ROOTIT Expanding Peat Plugs
- ✓ ROOTIT Bell Cloche if growing outside
- ✓ ROOTIT Propagator
- ✓ ROOTIT Grow Light System
- ✓ ROOTIT Heat Mats
- ✓ You could even post your plants to a friend with the ROOTIT Postal Pack.
- ✓ Mix ROOTIT First Feed with beneficial bacteria from 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...

Presoak 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, check every day.

If using ROOT!T Stonewool...

Presoak in water at a pH of 5.5 - 6.5, a quarter strength seed nutrient is essential for Stonewool, use ROOT!T First Feed. Make sure the plugs are totally soaked and squeeze to release excess moisture.

If using ROOT!T Expanding Coco Coir Plugs or ROOT!T Expanding Peat Plugs...

Soak the plugs in water until they are fully expanded. Create a small dibble in the top of each one that can take your seed. Add ROOT!T First Feed to your water to give your plants 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 or a mix of vermiculite to aid water retention. Add ROOT!T First Feed to your compost to give your plants a head start.

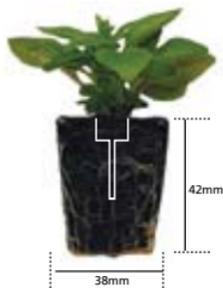
Make sure that all the pots and trays to be used are spotlessly clean and sterilised. Fill the pot or tray with moistened sowing compost and then firm it down lightly. (Always remember to moisten the compost thoroughly before sowing). Level off the top of the compost and once again firm it down lightly.

Sowing your Seed

For larger seeds use tweezers, 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 1½ times the seeds 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 Rooting Sponge is designed with a special planting hole at the ideal depth for seeds.

Tear off a small part of the plug and place over the seed, this will lower light levels and increase humidity triggering germination of most seed types.



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 seed, 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 disease attacks, especially the damping off disease 'Pythium'.

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 or cover the pot with a ROOT!T Bell Cloche with the vents closed, glass, or clingfilm (a Cloche or Propagator is best as it allows the seedlings to grow and without touching the cover which can lead to fungal problems). 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 will be required at around 22 - 25°C from either a ROOT!T Heat Mat, heated propagator or in an airing cupboard or warm room with a ROOT!T Grow 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 Bell Cloche or 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 Grow Light System which has the ideal light levels required and is cheap to run. Your seedlings will require 18 hours of light and 6 hours of darkness. Under no circumstances use a Horticultural HID light. The seedlings will not be strong enough to cope with a HID lamp until at least week 2. Once lighting is set-up you need to ensure a stable temperature, 24°C is the ideal temperature for germination and propagation. Try using a ROOT!T Heatmat. 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, 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, bell cloche, 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 bell cloche outside then 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

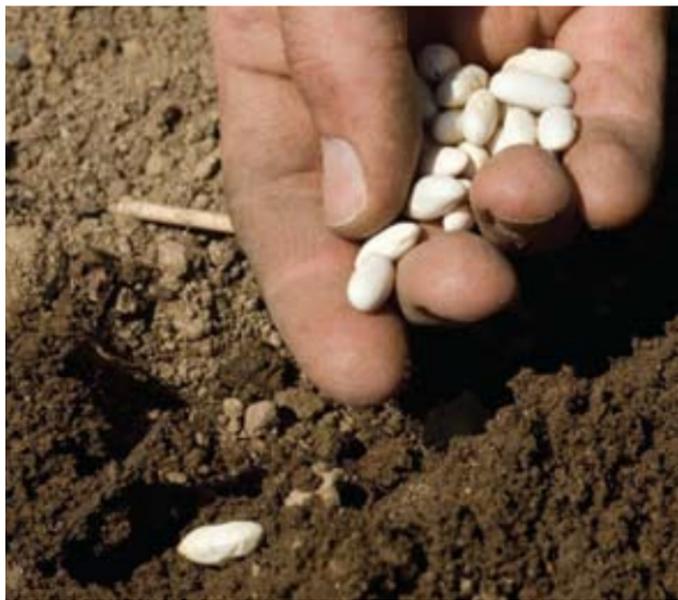
Sowing depths and distances are usually suggested on the back of seed packets or in any good gardening book. As a general rule remember that most seed will not germinate until the soil has warmed above 7°C. When sowing outside in early spring it is best to sow seed under ROOT!T Bell Cloches (if sowing in small areas or large planting spaces). If you place the cloches over the area to be sown two weeks before sowing, this will warm up the soil and encourage the seed to germinate.

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. Luke warm water is preferable to cold water.

As with indoor seedlings, it will be necessary to thin out the seedlings in order to prevent over-crowding. 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.



Using A Bell Cloche

The ROOT!T Bell Cloche is Ideal for establishing seedlings or young plants that require warmth such as peppers. They also protect from pests and bad weather, promoting an environment for strong and healthy growth. ROOT!T Bell Cloches can be used on the ground or in pots and are securely held in place with ground pegs supplied.

ROOT!T Bell Cloches are manufactured from high grade UV stabilised plastic, and have an adjustable air vent on the top to allow for humidity control. 'Cloche' is in fact French meaning 'Bell'. 'Bell Jar' cloches were originally made from hand blown glass and used extensively by gardeners in the Victorian era to bring on crops early so as to get 2 or even 3 crops in a year depending on the crop.

Benefits of using a ROOT!T Bell Cloche:

- ✓ ROOT!T Bell Cloches encourage stable and healthy growth of seedlings, tender and semi-hardy plants.
- ✓ ROOT!T Bell Cloches conserve warmth and humidity.
- ✓ ROOT!T Bell Cloches direct rainwater into the surrounding soil.
- ✓ ROOT!T Bell Cloches protect plants against damage from harsh weather.
- ✓ ROOT!T Bell Cloches can be used all year round for protecting young plants.
- ✓ ROOT!T Bell Cloches decorative appearance make them a focal point and an excellent and affordable gift to keen gardeners.
- ✓ ROOT!T Bell Cloches are small and mobile which makes them more versatile than a cold frame.
- ✓ ROOT!T Bell Cloches have an Air Vent for improved ventilation and humidity control and are supplied with ground pegs to hold your bells secure.

ROOT!T Bell Cloches uses:

- ✓ Encouraging growth and hardening off young plants.
- ✓ Warming & drying soil prior to sowing or planting outdoors.
- ✓ Over-wintering of herbaceous borders and less hardy perennials that would otherwise have to be transplanted during the winter.
- ✓ Growing winter lettuces and mixed salad crops.
- ✓ Encouraging early crops of salad, vegetables and fruit.
- ✓ Mature crops early which will keep plants cropping longer through the year.
- ✓ Ripening subtropical crops such as vines, peppers etc.
- ✓ Cloched strawberries will ripen at least three weeks earlier than unprotected ones.
- ✓ They can also help control some garden pests such as birds, rabbits, slugs and snails.



Seed Sowing Guide

SOW IN GENTLE HEAT / GREENHOUSE

SOW UNDER CLOCHES / GLASS

SOW OUTDOORS / UNHEATED

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
BROAD BEANS			OUTDOORS	OUTDOORS	OUTDOORS	OUTDOORS						OUTDOORS
RUNNER BEANS				GLASS								
BETROOT				GLASS								
CARROT- EARLY OUTDOORS	GLASS	GLASS	GLASS	GLASS	GLASS	GLASS	GLASS	GLASS	GLASS	GLASS	GLASS	
CABBAGE			GLASS									
CAULIFLOWER			GLASS									
COURGETTE				GLASS								
CUCUMBER GREENHOUSE			GREENHOUSE									
LETTUCE (SUMMER/AUTUMN)											GREENHOUSE	GREENHOUSE
LETTUCE (WINTER GREENHOUSE)											GREENHOUSE	GREENHOUSE
LETTUCE (SPRING)			GLASS									
PARSLEY			GLASS									
PEAS			GLASS									
PEPPER (INDOOR)			GREENHOUSE									
ROCKET			GLASS									
STRAWBERRY			GREENHOUSE									
TOMATO GREENHOUSE				GREENHOUSE								
TOMATO OUTDOORS				GLASS								

Use a ROOT!T 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 latest innovation 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.

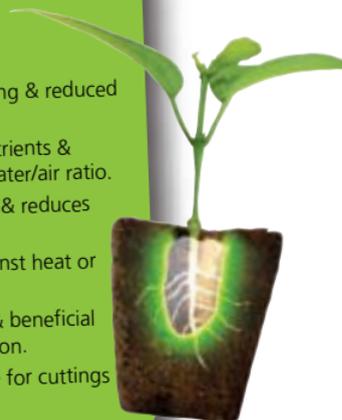


Products available to help you grow.. The Unique ROOT!T Rooting Sponge

Most of our kits feature the ROOT!T Natural Rooting Sponge which has demonstrated time after time 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 Gel4Plugs, it will encourage root growth on cuttings faster than any other growing media. What are you waiting for? Give it a try!

ROOT!T Natural Rooting Sponge Benefits

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



Products available to help you grow..

ROOT!T Propagation Kits

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 latest and fastest rooting available today, a sterile scalpel, ROOT!T Gel4Plugs Rooting Gel & ROOT!T First Feed and a book on how to grow from cuttings or seeds. The ideal introduction kit to propagation!

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 Gel4Plugs Rooting Gel
- ✓ Sterilised Scalpel
- ✓ 'How to' guide on achieving great results from your cuttings & seeds



Products available to help you grow..

ROOT!T Propagation Kits

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 leaf design 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 Gel4Plugs Rooting Gel and ROOT!T First Feed.

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



What's inside?

- ✓ Ventilated propagator lid
- ✓ Propagator base
- ✓ 24 cell insert with ROOT!T Natural Rooting Sponges
- ✓ ROOT!T First Feed
- ✓ ROOT!T Gel4Plugs Rooting Gel



Products available to help you grow..

ROOT!T Propagation Kits

ROOT!T® Postal Pack

Post cuttings and seedlings to your family and friends with the ROOT!T Postal Pack.

This robust postal propagator comes complete with 5 ROOT!T Natural Rooting Sponges offering the latest and fastest rooting. Simply take your cuttings/seedlings, place on the windowsill until plants develop then post, its that easy. No need for an outer envelope simply write the postal address on the label provided and send to your family and friends. The ROOT!T Postal Pack is the perfect gift for all ages.



44 How to take cuttings...



Products available to help you grow..

ROOT!T Plugs & Kit refills

ROOT!T® 24 Filled Insert & Tray

This is the perfect cutting and germination product.

24 ROOT!T Natural Rooting Sponges supplied in a specially designed insert and drip tray that can also be used as a germination lid. This ROOT!T 24 Filled Insert & Tray offers the latest and fastest rooting medium.



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 and easy to pot on.

This bag of 50 sponges can be used to refill trays or used on there 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 45

Products available to help you grow..

ROOT!T Bell Cloches

ROOT!T® Bell Cloche

ROOT!T Bell Cloches can be secured to the ground or pot with ground pegs (supplied) sold in packs of 3 cloches, each pack contains 9 ground pegs (3 per cloche). ROOT!T Bell Cloches are manufactured from high grade UV stabilised plastic, and have an adjustable air vent on the top to allow for humidity control.

Small cloche -

22 cm high x 26 cm diameter

Large cloche -

31 cm high x 33 cm diameter



Adjustable Vent



Ground Pegs (supplied)

Products available to help you grow..

ROOT!T Large Propagator

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 tray has been designed to be large enough to fit a whole SBS tray (Cultilène/Grodan/Jiffy) or used with loose growing media as a seed tray/hardening off tray.



Adjustable Vents



Propagator Lid

L:57.5 cm x W:37 cm x H:14 cm
(excluding handle)



Propagator Tray

L:57 cm x W:36.5 cm x H:5.5 cm



...and propagate from seed

Products available to help you grow..

ROOT!T Coco Coir Propagation

Coco Coir is the ideal substitute for peat. It comes from sustainable eco sources and is easy to use. It has a superior air to water ratio than peat which helps establish plants and encourage strong rooting.



ROOT!T® Expanding Coco Coir Plugs

Simply add water, watch them swell, then use to grow your cuttings or seeds. Each pack contains 36 x 36cm round plugs.

ROOT!T® Expanding Coco Coir Pot Blocks

Ideal for transferring your Coco Coir plug or Rooting Sponge into a bigger media for larger root growth. Available in packs of 4 blocks.

2 sizes available:

7.5cm x 7.5cm x 6cm (expanded volume 0.34L)

10cm x 10cm x 7cm (expanded volume 0.7L)



Unlike other brands our Expanding Plugs do not have netting at the base, this allows the tap root to grow naturally out of the base of the plug unrestricted avoiding root strangulation. Ideal for root vegetables.

ROOT!T Expanding plugs also available in peat versions.

Products available to help you grow..

ROOT!T Stonewool Kits for Hydroponic growing

ROOT!T® Stonewool Propagation Kit and ROOT!T® 24 cell trays/refill

Commonly used by commercial growers for hydroponic cultivation.

Whether sowing or cloning, ROOT!T Stonewool plugs are the solution to achieving a homogeneous sowing result.

Improving the homogeneity of the plugs produces uniform batches of plants because of the even distribution of water, nutrients and pH value. This consequently achieves better germination results. Not as easy to use as ROOT!T Natural Rooting Sponges as ROOT!T Stonewool is completely inert so pH monitoring is crucial.

The contents of these kits are similar to the ROOT!T Natural Rooting Sponge kits but contain ROOT!T Stonewool Plugs.



Products available to help you grow..

ROOT!T Rooting Gel

ROOT!T® Gel4Plugs Rooting Gel

ROOT!T Gel4Plugs Rooting Gel is the first rooting gel specifically formulated for use with growing media. ROOT!T Gel4Plugs Rooting Gel will root in 3-4 days, with no visible wilt, more root development and happy stress free clones from day one!

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

ROOT!T Gel4Plugs 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, Stonewool, peat plugs, coco coir plugs, fibre or compost.



Products available to help you grow..

ROOT!T Baby Plant Feed

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.



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 far 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).

Products available to help you grow..

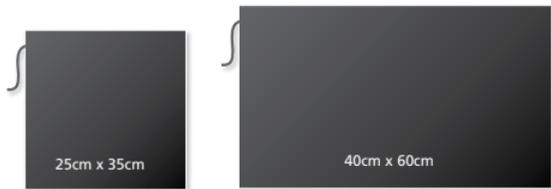
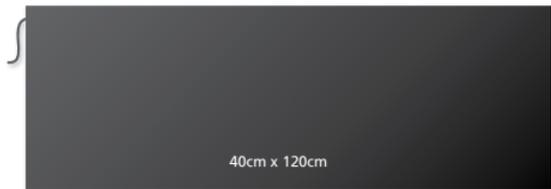
ROOT!T Heat your rootzone

ROOT!T® Heat Mats

Get a jump start on plantings with the ROOT!T Heat Mat! Adding uniform heat to your plants will speed up germination by days! ROOT!T Heat Mat offers more uniform heating than others on the market with its intricate pattern of fine wire throughout its waterproof, frayproof layers delivering the durability to withstand rugged greenhouse environments.

This mat warms the rooting area 10-20 degrees F over ambient temperature. A thermostat is also available for these heat mats offering complete temperature control.

Sizes available



Products available to help you grow..

ROOT!T Control the heat

ROOT!T® Heat Mat Thermostat controller

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 controls the temperature of heat mats evenly in colder or warmer than normal environments. It provides constant optimum temperatures for specific plants. It has an easy plug-in operation with an illuminated indicator.

Features:

- ✓ Controls temperature of heat mats evenly in colder/warmer than normal environments.
- ✓ Provides constant optimum temp for specific plants.
- ✓ Easy plug-in operation.
- ✓ Indicator light.
- ✓ Simple to use.



Products available to help you grow..

ROOT!T Grow Lights

ROOT!T® Grow Light System

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

Each ROOT!T Grow 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



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

Not only is it simple and easy to use, it promotes great plant growth and it is cheap to run.

Available in 2 lengths.

2 Foot Jump Start dimensions: L:66cm x W:46cm x H:61cm

4 Foot Jump Start dimensions: L:127cm x W:46cm H:81cm





Visit our website for more exciting products
www.propagateplants.com

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