



The Grower's Guide

Propagation - Plant Nutrition - Plant Care



Who are we?

Growth Technology was founded in Western Australia in 1985. It has grown steadily and now operates with a manufacturing and distribution base on three continents.

We employ professional chemists and plant scientists, who lead our cutting-edge product development.

We are driven by our desire to develop products that are easy to use and can deliver high-yield crops. This passion is reflected in our innovative products, all of which are formulated with extreme care to quarantee consistent benefits for the grower.

Our commitment to quality control ensures that our products can be used with confidence.

Every one of the thousands of batches of nutrients that we manufacture is fully analysed and tested for consistency by independent third-party laboratories. Each batch is checked individually and approved before leaving our factory.

www.growthtechnology.com



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EARLY GROW

GROW

Clonex®

Rooting Hormone Gel

Clonex is used by professional and amateur gardeners around the world who seek better, more consistent growing results.

The Clonex formula is an advanced plant hormone, that makes plant propagation easier, faster and more successful.

To obtain the highest possible success rate in propagation, each cutting needs to be sealed and then supplied with hormones to promote and protect root cell development. Clonex meets all these needs in an easy-to-use gel that adheres to the cuttings, ensuring the continuous delivery of everything the new plant needs. Clonex is simply the best rooting hormone gel because:

- Clonex seals cut tissue instantly, minimizing the risk of infection and embolism.
- Clonex has a rooting hormone concentration of 3,000 parts per million, the full strength needed for explosive root development.

It is easy to use:

 Clonex gel is far safer than liquids or powders, because it cannot splash or be blown away. Unlike liquids and powders, Clonex remains in contact with the stem throughout the rooting period.

Always pour Clonex into a dish before use. This prevents any potential contamination of the remaining Clonex.







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Root Riot

Establishing healthy, successful cuttings is a breeze when growers use a medium with the perfect air/water retention ratio.

Strong roots become established quickly in Root Riot cubes, whose spongy texture presents the ideal root environment. To foster the growth of young plants, Root Riot cubes have a structure which allows delicate new roots the best environment to rapidly develop.

Root Riot cubes are the ideal propagation medium for soil and hydroponic plant growth:

- Root Riot encourages faster, more vigorous rooting.
- · Root Riot is easy to use, clean and dust-free.
- · Root Riot provides reliable results.
- · Root Riot is fully biodegradable.
- · Ideal pre-cut hole size to support the cutting.









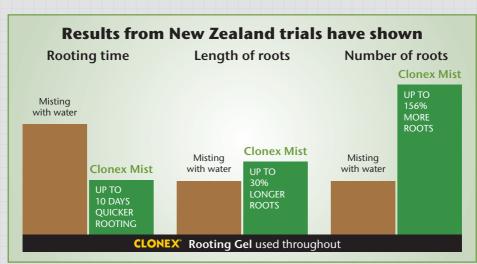
Clonex® Mist

Through extensive plant studies and painstaking trials, we have created the ultimate addition to a grower's propagation tool kit: Clonex Mist.

Designed to work with or without Clonex Rooting Hormone, Clonex Mist dramatically accelerates the rooting and establishment of a healthy foundation for new plants. Independent trials conducted by Dr. Lynette Morgan of Suntec Laboratories, New Zealand have shown that the use of Clonex Mist in conjunction with Clonex Rooting Gel generates roots up to ten days earlier on Ficus cuttings – and those roots are up to 30% longer and 156% more numerous than the roots observed while using the Clonex Rooting Gel on its own.



To obtain healthy, consistently successful batches of clones, use Clonex Mist with Clonex Gel every time!



EARLY GROW

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How to take successful cuttings!

Why take cuttings? In any crop a single plant will stand out as being the healthiest, most prolific and simply the best. Being able to genetically replicate this is the best way to increase stock of the best possible plants. Seeds give genetic variation; cuttings (clones), give the grower identical plants to the parent plant.

Step 1 Prepare the parent plant

Start 2-3 days before cuttings are taken - Select a set of suitable growing tips on the parent plant and spray with Clonex Mist. The amino acids will prepare the growing tips for rooting.

Step 2 Preparation

Pour some Clonex into a dish or shot glass - Close the Clonex bottle for future use.

Step 3 Taking the cutting, 2 cuts are required!

Cut 1: choose a branch on the parent plant with 2 or 3 sets of leaves, cut with the scissors just above a node (What's a node!?#1).

Cut 2: trim all but a couple of healthy leaves from the cutting, now using the sterile scalpel make a 45° cut just below the next node. The 45° angle gives the exposed plant tissue more contact surface area with the Clonex.

What is required?

- Chosen healthy mother plant
- Sterile scalpel
- Sterile scissors
- Clonex & Clonex Mist
- · Shot glass or similar dish
- Root Riot cubes
- Propagator

Scan this and see how to take the best cuttings on our website!



Step 4 Dip & Plant

Take the cutting and immediately dip it in the Clonex, ensuring that the bottom couple of centimetres are covered in the gel. Gently push the stem into a Root Riot cube.

Step 5 Mist & place in propagator

Once the cuttings are complete, place the new cuttings in a propagator and mist with Clonex Mist. Repeat the misting every 2 days. Ideally place under a propagator T5 light for 18 hrs per day in a temperature of 23°C. Don't allow the cubes to dry out; the moisture level is perfect when there is a slight condensation on the inside of the propagator lid. Once the plants start to show signs of growth, lift the propagator lid slightly or open the vents.

#1 a node... a node is the point where leaves join the stem of a plant. At the base of each leaf there is a dormant bud. Taking cuttings just above a node allows 2 new stems to grow from the base of each leaf.















Growing in Soil: Alpha-Mix

To grow to their full potential, plants require a substrate with different components. With its deliberately blended open structure, Alpha-Mix ensures maximum aeration in the root zone and resists waterlogging.

With access to these key benefits, plants grow more quickly and more vigorously. The organic ingredients in Alpha-Mix give young plants an optimal start and supply nutrients for the first two weeks of explosive growth.

Alpha-Mix is a professionally formulated soil mix that is created by blending selected components and organic substances.

Alpha-Mix contains a precise blend of:

- Black peat and white sphagnum peat extracted from sustainable Baltic sources, giving the soil structure that facilitates rapid root establishment
- Natural lime, balancing the pH of the media and ensuring that the plant has access to the available nutrients
- · Pure worm casts, providing long-term fertility in the root zone
- Blended organic nutrients, establishing the plants and promoting explosive early growth
- Volcanic lava sand, offering the best possible drainage media to ensure roots do not become waterlogged.







EARLY GROW

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Formulex NUTRIENT

Formulex is a multi-purpose product that can be used in many ways to benefit plants.

Diluted in water, Formulex is the ideal professional formula for feeding seedlings, transplants and clones, ensuring that the plants thrive in the early growth stage. All soil-grown plants benefit from the advanced, stable properties of Formulex. Foliar feeding with Formulex aids young plants while their root systems are being established, ensuring that they get the healthiest possible start.

Formulex is a complete, balanced and stabilised solution containing all the macro and micro nutrients required for optimal plant growth.

- Formulex is stable and complete. It was designed for hydroponic applications where every nutrient element must be supplied in a solution.
- · Formulex is versatile. It is suitable for hydroponic or soil cultivation and is especially recommended for foliar feeding.
- · Formulex is concentrated. With a working solution that is up to 200 times the volume of the concentrate: it offers great value.



How to use:



Soil gardening Use 5ml per litre of tap water. Apply weekly.



Hydroponics Use 10ml per litre of tap water.



Foliar feeding Use mist or spray onto plant foliage weekly. Use 5ml per litre of tap water.



GreenFuse Root STIMULATOR

The natural ingredients contained in GreenFuse Root help to initiate new roots, reduce shock and nourish young plants as they become established.

Once the cuttings are established it is also important to stimulate robust development at the cellular level. The addition of GreenFuse Root at this stage provides a significant benefit to young plant nutrition. GreenFuse Root stimulates strong root growth, setting up the plant early on for its later vegetative and blooming phases of its life.

GreenFuse Root can be used at all propagation stages and is beneficial to all young plants. It can be applied to seedlings or to young plants. GreenFuse can be used with Formulex in the early stages of plant growth.

Formulex and GreenFuse Root are ideal partners to give your plants an explosive healthy start to life!





EARLY GROW

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IONIC NUTRIENTS

Ionic Grow is the world's first product to deliver a complete nutrient system for plants in a single bottle.

The advanced, yet easy-to-use formulation optimises plant yields. The essential nutrients in Ionic are chemically bonded together in a highly stable form until they are taken up through the roots, where they are delivered in the exact ratios required by the plant. This method of delivering essential elements is far more precise than using twin packs.

Precision – Ionic contains **all** the essential nutrients in the exact ratios needed for vigorous plant growth. Swap from Ionic Grow to Ionic Bloom for the bloom and fruiting phase of growth for superb high yield crops.

Easy Control – The complex formulation within Ionic Grow ensures that most growers have no need to further adjust pH.

Performance –The precise delivery of Ionic Grow nutrients results in consistent plant growth. Key micro nutrients, such as cobalt and nickel, allow plants to efficiently process the available nitrogen and support the production of vitamins and enzymes. The ideal nutrient tank mix

We have created a precise Ionic formulation for each growing situation.



during the Grow phase.

Ionic is available in the following sizes and varients:

HYDRO	HYDRO HARDWATER	SOIL	сосо
• 1 Litre • 2 Litre • 5 Litre • 20 Litre	• 1 Litre • 2 Litre • 5 Litre • 20 Litre	• 1 Litre • 2 Litre • 5 Litre • 20 Litre	• 1 Litre • 2 Litre • 5 Litre • 20 Litre

See Pages 20, 21 & 22 on how best to use IONIC!



Maximise results with **Nitrozyme ENHANCER**

For optimal results, use Nitrozyme with Ionic Grow and Bloom. This highly concentrated, organic kelp extract is packed with growth-promoting hormones that have a truly amazing effect on crop performance. Simply mist Nitrozyme over foliage or add it while watering the root zone, and watch the plants thrive.

In independent tests, plants grown with Nitrozyme have had:

- 57% more leaves
- 34% larger leaves
- Flowers up to five days earlier



Maximise plant nutrition with GreenFuse STIMULATOR

Designed to trigger improved nutrient uptake in the roots, GreenFuse's amino acid profile supports favourable microbiological life in the root zone.

The different GreenFuse blends promote extraordinary growth, flowering and fruiting through the plants life cycle. Choose the GreenFuse Stimulator to match either the Grow or Bloom nutrient.



Keep plants stress-free with SuperDrive VITAMINS

SuperDrive is a highly effective solution for reducing plant stress and maximising plant growth.

Applied through the roots or leaves. SuperDrive can be added to nutrient solutions and used throughout the life of the plant, from seedling to harvest.



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Green Haze NUTRIENT

GreenHaze is the ultimate twin pack

For a twin pack alternative to IONIC we offer GreenHaze Grow and Bloom. These solutions were initially developed for NFT systems which is a very demanding application. It has proven its worth over many years and is used now in many different cultivation systems, proving especially well-suited to deep water culture growing. The Grow solution is properly formulated to support vegetative growth and will deliver vigorous plant growth and strong, healthy roots. GreenHaze Bloom provides a higher potassium to nitrogen ratio than the grow formulation, as is required for the flowering stage of growth. It is a solution designed to deliver

GreenHaze performs well in both hard and soft water but, like all twin-packs, it will need regular adjustment of the pH. See page 18 on how to adjust pH.

fragrant blooms and heavy harvests.

Available Sizes

1 litre | 5 litre | 20 litre

How to use:



Measure the 'Part A' pack first and add to the tank, mixing thoroughly.



Rinse the measuring jug, then measure the 'Part B' pack and add to the tank, mixing thoroughly.



Check the E.C. following guidelines on page 23.



Maximise results with **Nitrozyme ENHANCER**

For optimal results, use Nitrozyme throughout the growth cycle. This highly concentrated, organic kelp extract is packed with growth-promoting hormones that have a truly amazing effect on crop performance. Simply mist Nitrozyme over foliage or add it while watering the root zone, and watch the plants thrive.

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EARLY GROW

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Ionic PK Boost NUTRIENT BOOST

Ionic PK Boost delivers phosphorus (P) and potassium (K) in a pure form that is instantly accessible to plants.

These key elements are crucial during the flowering cycle, so the extra levels provided by PK Boost will lead to significantly larger flowers and heavier crops.

Ionic PK Boost is a nutrient supplement designed to be used in the final few weeks before harvest. PK Boost is ideal when paired with Ionic Bloom or GreenHaze Bloom but it can be used with any well formulated Bloom nutrient.

Available Sizes

300ml | 1 litre | 2 litre | 5 litre | 20 litre

PK Boost 14:15 is more concentrated than the former Boost product.

We are still advising dosage at 1ml per litre but suggest reducing frequency to a weekly dose.

PK Boost 14:15 at 1ml per litre will raise the E.C. by around 0.35 mS/cm and add:

P – approx. 60ppm K – approx. 125ppm





Nutrient Management Liquid Oxygen

Liquid Oxygen dramatically improves the performance of hydroponic systems.

It oxygenates and cleanses the nutrient solution, enhancing growth rates and protecting against disease.

Liquid Oxygen adds pure oxygen ions to the nutrient tank, thereby helping to control root diseases and pathogens at that point in the system. Regular use leads to a higher rate of uninterrupted growth, which results in healthier plants.

Liquid Oxygen can be used at a higher concentration to clean and sterilise hydroponic systems between crops, as well as pots and benches in the greenhouse and elsewhere.

When to use Liquid Oxygen and when not to use Liquid Oxygen

USE Liquid Oxygen with mineral nutrients to enhance root function and nutrient uptake

USE Liquid Oxygen to sterilise your system in between crops

DO NOT USE Liquid Oxygen at the same time as any organic nutrient or stimulant

Liquid Silicon

Adding Liquid Silicon will result in vastly improved root structure and resistance to pests and disease. The addition of Liquid Silicon will help plants showing signs of drought stress.

What are the benefits?

Most importantly, silicon is incorporated directly into the cell walls, interacting with cellulose, to greatly add strength to the architecture of the plant. This process begins as soon as silicon is added and continues throughout the life of the plant.







EARLY GROW

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Silicon... the missing element.

Stems become thicker and leaves take on a darker green colour, improving their light collecting potential and thus boosting photosynthesis. Every process in the plant is enhanced by this - which means stronger more vigorous growth, better resistance to pests and disease and – at the end of the cycle heavier harvests.

- Improves uptake and transport of nutrients throughout the plant.
- Strengthens cell walls, helping plants to resist attack from fungi and mites.
- Increases chlorophyll production leading to darker green leaves and improved light collection.
- Increases uptake of available CO₂ and utilises the enhanced metabolic processes to deliver higher yields.
- Adds very useful extra potassium for enhanced flowering.

Liquid Silicon has an important role in the uptake and vascular transport of mineral nutrients, and can greatly improve the mechanical "strength" of the plant and its resistance to fungal diseases.

The addition of Liquid Silicon to nutrient solutions can greatly reduce the incidence and severity of fungal diseases including Botrytis (bud rot) and powdery mildew.

Recent research has demonstrated that raising the silicon concentration in hydroponic solutions produces thicker, whiter, healthier root systems and increased yields.

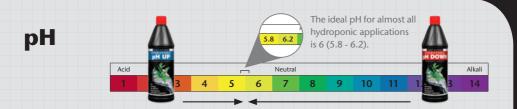
Silicon has also been shown to result in higher concentrations of chlorophyll per unit area of leaf tissue. This means that a plant is able to tolerate both lower and higher light levels by using more of the available light.

How to use:

Always dilute the Liquid Silicon before use. Add 1ml per 2 litres of final tank volume. Always adjust pH after adding Liquid Silicon and nutrients.







pH is a measurement of the acidity or alkalinity of a solution. On a scale of 0-14 neutrality is represented as 7. pH is important because nutrients only become available to the plants within a specific pH range.

What pH for a passive hydroponic system?

These are simple top watered pots or a gravity fed system, such as Autopot.

These systems use pots full of a medium such as Soil, Perlite, Rockwool (grow cubes or granulate) or Coco. It is ideal to make a 200 litre batch of nutrient at a time. Once this is made up to the correct 'strength' (conductivity), the pH can be checked and adjusted to the ideal level of 5.8-6.2. A careful note should be made of the exact amount of pH UP or pH DOWN that is added at this time, so as to develop a reliable routine of good plant management.

What pH for an active hydroponic system?

These are pump powered systems, such as NFT, ebb and flow, drippers, DWC, IWS and aeroponics.

In an active system the pH will need checking and adjusting in the main tank on a regular basis. In most systems fresh water is added to the tank to replace that used by the plants. The incoming water is usually of a higher pH than the nutrient solution so there tends to be an upward drift in pH. This can be corrected by the addition of small amounts of pH DOWN. This process of pH control can be carried out with a pH kit but as it needs doing often in this system, the busy grower would be better off using a meter.



How to use:

pH solutions are very concentrated, so always dilute in water before use. Add a little at a time, allowing it to mix, then check the pH. Repeat as necessary. Ideally waiting 30 minutes before final adjustment.



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Environmental Conditions & E.C.



E.C. – how much nutrient: get it right for the plants.

The conductivity of a solution refers to it capacity to conduct electric current. Distilled or de-ionised water containing very few or no charged ions will conduct virtually no electricity and will therefore have a conductivity reading of zero. The conductivity of a solution increases with the addition of dissolved salts which form charged ions in solution. The conductivity of a nutrient solution can therefore be used as a guide to its strength as it indicates the amount of mineral salts dissolved.

Conductivity is usually expressed as 'E.C.' E.C. stands for Electrical Conductivity and the unit measurement is milliSiemens per centimetre (mS/cm).

Most nutrient solutions have a working E.C. of 1.5 or 2.0 mS/cm – see the Instruction charts on pages 20-23 for the Growth Technology product requirements.

'The Bluelab Truncheon the most reliable, accurate and robust E.C. meter on the market today!"

How to use your nutrients

NEW TO GROWING? Single pack Ionic

Keep it simple



Accurately measure the Grow or Bloom nutrient using a measuring jug



Add to the grow tank



Check the E.C. - see page 18



Check the pH, adjust if necessary – see page 17

NEW TO GROWING? Twin pack GreenHaze

Keep it simple



Accurately measure the 'Part A' nutrient using a measuring jug



Add straight to the grow tank, mix thoroughly



Accurately measure the 'Part B' nutrient using a measuring jug, add to the tank



Check the E.C. - see page 18 and 23



Check the pH, adjust if necessary - see page 17

ADVANCED GROWER?

Get the ultimate results



Add Liquid Silicon to the tank



Add Grow or Bloom, as per 'New to Growing' Single or Twin pack page 18 or 19



Add the GreenFuse stimulant



Add the SuperDrive vitamins



Always add Liquid Silicon first and adjust pH last.



EARLY GROW

GROW



NEW TO GROWING?

TRY THIS METHOD



ADVANCED GROWER?

GET THE ULTIMATE RESULTS FROM YOUR PLANTS

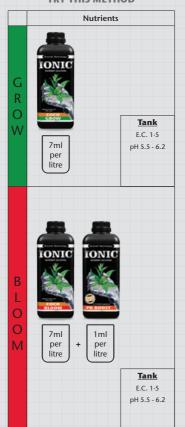
	Nutrients		Stimulator	Enhancer	Vitamins
G R O W	7ml per litre	Tank E.C. 2-0 1.5 for Rockwool pH 5.5 - 6.2 Rockwool 5.5 - 5.8	Green Fuse	0.5ml per litre	Super Drive 2ml per litre
B L O O M	IONIC From Tonic Per litre	+ Iml per litre Tank E.C. 2-0 1.5 for Rockwool + 0.3 for PK Boost pH 5.5 - 6.2	Green Fuse 1ml per litre	0.5ml per litre	Super Drive 2ml per litre



HOW TO USE

NEW TO GROWING?

TRY THIS METHOD



ADVANCED GROWER?

GET THE ULTIMATE RESULTS FROM YOUR PLANTS





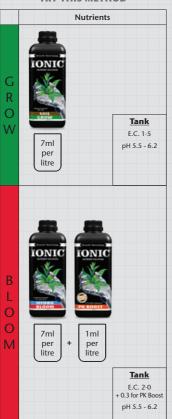
EARLY GROW

GROW

HOW TO USE

NEW TO GROWING?

TRY THIS METHOD



ADVANCED GROWER?

GET THE ULTIMATE RESULTS FROM YOUR PLANTS

	Nutrients		Stimulator	Enhancer	hancer Vitamins	
G R O W	IONIC 7ml per litre	Tank E.C. 1-5 pH 5.5 - 6.2	Green Fuse 1ml per litre	2ml per litre	Super Drive 1ml per litre	
B L O O M	IONIC Toligon Tolig	Tank E.C. 2-0 + 0.3 for PK Boost pH 5.5 - 6.2	Green Fuse Indiana Ind	wiltrozyme and parameters and per litre	Super Drive Iml per litre	



Ideal for: NFT, Deep Water Culture, Dripper Systems

HOW TO USE



Vitamins

2ml

per

litre

2ml

per

litre

Enhancer

NEW TO GROWING?

TRY THIS METHOD



Tank

E.C. 2.0 1.5 for Rockwool

pH 5.5 - 6.2

Rockwool 5.5 - 5.8

Tank E.C. 2-0 В Α 1.5 for Rockwool 4ml 4ml 1ml 0.5ml pH 5.5 - 6.2 per per per per litre litre Rockwool litre litre 5.5 - 5.8 В Α M 4ml 4ml 1ml 1ml 0.5ml per per per per litre litre litre litre litre Tank E.C. 2.0 1.5 for Rockwool pH 5.5 - 6.2 Rockwool 5.5 - 5.8

ADVANCED GROWER?

GET THE ULTIMATE RESULTS FROM YOUR PLANTS

Stimulator

Nutrients



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