

**ESSENTIALS**

# **Growroom Management**

Solutions for successful growroom management



# Essentials

## Solutions for successful growroom management

**When running a hydroponic growroom or greenhouse, good management of your nutrient solution and general growroom hygiene should be high on your list of priorities.**

By keeping your growing environment clean and tidy and free of biomass, many diseases need never become a problem. Keep a regular check on the pH, EC and oxygen levels of your nutrient solution, any fluctuation off the correct levels can mean poor plant growth and should be readjusted before it becomes a serious problem. Regular checking of your nutrient solutions won't take long and can save a lot of damage in the long run.

### It's simple really...

Use the Essentials range of professional growroom products to provide your plants with better growing conditions and they will reward you with faster growth and more yield.

**For more information on growroom management go to:**

[www.growcontrol.co.uk](http://www.growcontrol.co.uk)

This booklet covers the following topics

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## Maintaining a clean growing environment

**Good practice in the growroom is the key to insect and fungus prevention and a healthy crop. Keep the floor clean. Keep all algal biomass off the surface of your growing media as this can create the perfect environment for disease. Regular use of Essentials BlockClean will keep this biomass at bay.**

Do not use mulch. Insects and fungi thrive under dead decaying leaves or composting material so pick up fallen leaves and dispose of them. Grower's tools often transport many microscopic pests, diseases and fungi that could ultimately destroy your crop. This means regular sanitary precautions must be taken. A

separate set of indoor tools is easy to keep clean. Disinfect these after each use by soaking in or washing with Essentials RoomClean. Similarly when taking clones always make sure you have cleaned your scalpel and board with Essentials RoomClean.

Take care not to leave decomposing organic material in your nutrient solution or trays – this material should always be removed as it will cause a depletion of oxygen. Lack of oxygen at the root zone



is the leading cause of root death. Roots NEED oxygen. Roots should never sit in stagnant or ponding nutrient solution so always aerate your nutrient solution with an air pump and air stone.

Well or spring water can be high in methane and organic sulphates, both of which OxyPlus will remove. The free oxygen OxyPlus releases is extremely effective at eliminating many disease causing organisms and spores.



### **Clean your growroom after harvesting.**

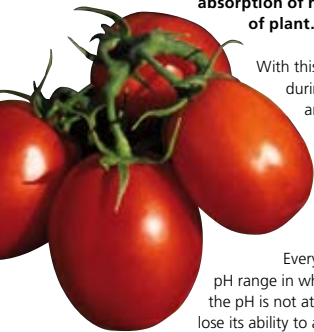
For limiting outbreaks of botrytis (bud rot) and pythium (root rot), it is good practice to wash down all equipment, reservoirs, the walls and the entire floor with Essentials RoomClean concentrate. You can plant out straight afterwards as RoomClean is an organic product.

Allow this to air dry, repeat if possible or if you had a previous disease problem. Spray any motherplants down with a neem oil solution such as Neem Repel before you put them back in as an extra line of defence.

If your problems remain once the room is 100% cleaned with Essentials RoomClean, unplug all electrical equipment and fill the room with ozone from a unit such as the Hydrozone. This is the final sterilisation and will eliminate any missed spores. Evacuate the room for at least 2hrs and then put on the intake and exhaust fans at full power for several hours, which removes the ozone.

## pH in a nutrient solution

The pH of a nutrient solution determines the availability and absorption of nutrients by each species of plant.



With this in mind, pH must be checked during the start-up of the new crop and then monitored at frequent intervals up until harvest. pH is measured on a scale of 1–14 with 7 being “neutral”. Acids are lower than 7 and alkalis are above 7.

Every plant species has a preferred pH range in which it will grow best. When the pH is not at the proper level the plant will lose its ability to absorb some of the essential elements required for healthy growth.

For all plants there is a particular pH level that will produce optimum results (see chart 1 opposite). This pH level will vary from plant to plant, but in general most plants prefer a slightly acidic growing environment (between 6.0–6.2), although most plants can still survive in an environment with a pH of between 5.0 and 7.5.

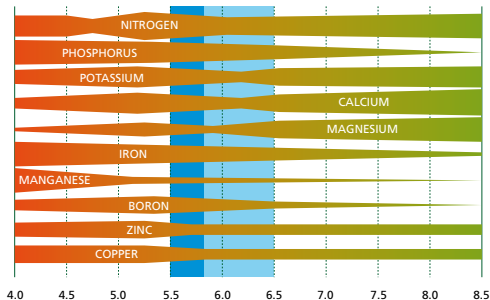
When pH rises above 6.5 some of the nutrients and micro-nutrients begin to precipitate out of the solution and can stick to the walls of the reservoir and growing system. For example: Iron will be about half precipitated at the pH level of 7.3 and at about 8.0 there is

virtually no iron left in the solution at all. In order for your plants to use the nutrients they must be dissolved in the solution. Once the nutrients have precipitated out of the solution your plants can no longer absorb them and will suffer (or die). Some nutrients will also precipitate out of the solution when the pH drops.

Commercially available nutrient solutions are balanced in pH, but when they are diluted with water from a different source i.e. tap water, the pH may change from acceptable to unacceptable for the plant.

### CHART 1

- acceptable pH range is between 5.5 - 6.5
- optimum pH range is between 5.5 - 5.8



## CHECKING pH

Checking and adjusting pH levels in a hydroponic system is easy.

The Essentials pH test kit is the cheapest method to check pH for the hobby gardener. These test kits work by adding a small amount of the nutrient solution to a vial, adding drops of test solution and mixing. Then comparing the colour of the resulting liquid in the vial with a colour chart.

The most accurate way to check pH is to use the Essentials professional pH digital meter or Trident Tri-meter. You simply dip the electrode into the nutrient solution for a few moments and the pH value is displayed on an LCD display. Essentials pH meters are very accurate (when properly calibrated) and fast. Like all laboratory grade instruments they need to be cared for properly.

All pH meters are temperature sensitive. A benefit of the Essentials pH meter is that it has Automatic Temperature Compensation (ATC), which corrects the reading with respect to temperature. On meters without ATC the pH should be checked at the same time of day each time in order to minimise any temperature related fluctuations.

All digital meters use a pH electrode that drifts over time so calibration should be checked (and corrected

if necessary) every week. For hydroponics, this is often done at pH7 with Essentials Buffer 7 and then at pH4 with Essentials Buffer 4. This provides two calibration points on either side of the usual working value of pH5.5 to pH6.2, however not all pH meters require two-point calibration i.e. Essentials pH meter. **Note that the optimum pH value for soil is different for hydroponics (usually pH6.0 to pH6.5)**

All hobby pH sensors last between 1 and 2 years in a hydroponic system depending on the amount of tests you carry out. We would recommend that you change your meter every 2 years to assure accurate readings. To help your meter last as long as possible you should store the electrode in water. The tip should never be allowed to dry out, pH instruments are very susceptible to extreme temperatures and moisture so always keep them in a cool dry place.

## ADJUSTING pH

The most popular minerals used by the hobby gardener to adjust pH are phosphoric acid (to lower pH), and potassium hydroxide (to raise pH). Both of these minerals are used in the Essentials pH product range and when used correctly are perfectly safe, although care should be taken as they can cause burns. They should also never be stored together. Essentials pH adjusters come in 2 strengths: Easy Control 25 that is diluted to a level that is easier to use for the novice grower and standard pH adjusters, favoured by professional growers using large reservoirs. These tend to be more cost effective due to their high concentration but can cause large pH changes and can make adjusting the pH quite frustrating.

Always add the nutrients to the water before checking and adjusting



the pH of your nutrient solution. The nutrients will usually lower the pH of the water due to their chemical make up. After adding nutrient and mixing the solution, check the pH using whatever means you have. If the pH needs to be adjusted add the appropriate Essentials pH adjuster. Use small amounts of pH adjuster until you get familiar with the process. Re check the pH and repeat the above steps until the pH level is where you want it to be. When using concentrated pH adjuster always mix with water to dilute their strength making adjustments easier.

The pH of the nutrient solution will have a tendency to go up as the plants use the nutrients. As a result, the pH needs to be checked periodically (and adjusted if necessary). As a rule you should check the pH level of your solution on a daily basis. Each system will change the pH at a different rate depending on a variety of factors: the type of growing medium used, the environmental conditions and temperature of solution, kind of plants and even the age of the plants all effect the pH variations.

### As a general rule of thumb, always make sure you maintain a pH range between 5.4 and 6.5 (excluding soil).

As an alternative to standard pH UP you could consider using Essentials Silicon which has a very high pH. This will raise the pH of your solution plus add silicon which is beneficial for plant growth.

#### pH in rockwool slab drip feed systems

If you are growing in a rockwool medium such as Grodan you need to note that readings taken from the reservoir may not reflect the actual level within the slab. Nutrient solution should be tested from

## CHART 2

HYDROPONIC CROPS AND TYPICAL TARGET CF* FOR NUTRIENT STRENGTH AND PH				
CROP	EASE OF GROWING	CF*	PH	NUTRIENT NEEDED
ASPARAGUS	✓	14-18	6.0-6.8	🌱
BANANA	✓	18-22	5.5-6.5	🌱🌸
BROCCOLI	✓✓	28-35	6.0-6.8	🌱🌸
CABBAGE	✓✓	25-30	6.5-7.0	🌱
CELERY	✓	18-24	6.5	🌱
COMMON BEAN	✓✓	20-40	6.0	🌱🌸
COURGETTES	✓✓✓	18-24	6.0	🌱🌸
CUCUMBERS	✓✓✓	17-25	5.5	🌱🌸
LEEK	✓	14-18	6.5-7.0	🌱🌸
LETTUCE	✓✓✓	8-12	6.0-7.0	🌱
MARROW	✓	18-24	6.0	🌱🌸
OKRA	✓✓	20-24	6.5	🌱
PAK-CHOI	✓✓✓	15-20	7.0	🌱
PEPPERS	✓✓	18-22	6.0-6.5	🌱🌸
RHUBARB	✓	16-20	5.5-6.0	🌱
SPINACH	✓✓✓	18-23	6.0-7.0	🌱
STRAWBERRIES	✓✓✓	18-22	6.0	🌱🌸
TOMATOES	✓✓	20-50	6.0-6.5	🌱🌸
AFRICAN VIOLET	✓✓✓	12-15	6.0-7.0	🌱🌸
CARNATION	✓✓✓	20-35	6.0	🌱🌸
FICUS	✓✓	16-24	5.5-6.0	🌱🌸
ROSE	✓	15-25	5.5-6.0	🌱🌸
BASIL	✓✓✓	10-16	5.5-6.0	🌱
PARSLEY	✓✓✓	8-18	5.5-6.0	🌱
SAGE	✓	10-16	5.5-6.5	🌱

✓✓✓ Very easy to grow  
 ✓✓ Quite easy to grow  
 ✓ Not so easy to grow  
 🌱 Grow nutrient  
 🌸 Bloom nutrient

\*To convert these CF values to EC, divide by ten. (E.G, a reading of 14CF becomes 1.4 EC)

the slab on a regular basis with a syringe.

You should always pre-soak rockwool media with water the day before planting, then flush with nutrient solution just prior to planting. This will flush out any pH initial spikes due to residual lime from the production process. Always keep the pH level above pH5, if you have a pH lower than pH5 you risk damaging the rockwool media.

### pH in a soil-based system

It is as equally important to check the pH level in your soil-based systems as it is in hydro if you are to prevent nutrient lockout due to pH fluctuation.

To check the pH level of your soil take some plain water and adjust the pH to 7.0. You must make sure that you

know the exact pH of the



water going into your soil. Collect the first drops of run off water in a small cup then test the pH level of the solution with the Essentials pH meter. In most circumstances the solution will drop in pH value. If the solution is between 6.5 and 7.0 then that is fine otherwise adjust the pH level of your solution to suit. pH levels can drop in later stages of

## EC/CF in a nutrient solution

**The function of a nutrient solution is to supply the plant roots with water, dissolved oxygen and essential mineral elements in soluble form. The success of a hydroponic system depends heavily on the correct control of this nutrient solution in terms of strength.**

Each plant has its preferred solution concentration to facilitate the absorption process to the roots. Choosing the correct strength at each growing phase of the plant will result in optimum growth. See Chart 2 – optimum pH/EC levels (p9).

We most commonly measure a nutrient's concentration by measuring in EC, CF and ppm (parts per million) values. Nutrient solutions must be monitored as frequently as possible. The warmer your growroom the more water the plant will use and transpire, thus increasing the nutrient strength. As water evaporates or is used by your plants transpiring, the salt level will increase meaning your EC/CF value will rise. High EC/CF values, mean a high nutrient concentration which if too high can be toxic to the root zone and will cause



poor and stunted growth. At extreme levels, too high a level will cause actual death in the root zone. When planting out you start with a weak solution then increase nutrient EC/CF levels gradually over time rather than suddenly and all at once.

#### How we measure EC/CF

The conductivity of a solution is an expression of the capacity of that solution to conduct an electric current. As nutrient salts are dissolved in the water so the conductivity of the solution increases. The conductivity of a nutrient solution is therefore a measurement of its "strength" as indicated by the actual amount of salts dissolved.

Conductivity is usually expressed in terms of CF or EC. CF stands for Conductivity Factor, EC stands for Electrical Conductivity. The difference between these is purely in the placing of the decimal point. An EC unit is equal to 10 CF units so an EC of 1.2 would be a CF of 12.

The most accurate way to check EC/CF levels is to use the Essentials professional EC digital meter or Trident tri-meter. You simply dip the electrode into the nutrient solution for a few moments and the EC value is displayed on an LCD display. Essentials EC meters are very accurate and fast. However like all laboratory graded instruments, it needs to be cared for properly. Make sure you calibrate your EC/CF meters regularly with Essentials CF Standard.

#### EC/CF in Rockwool slab systems

If conductivity begins to rise in the slab it will be an indication that irrigation is either too infrequent or too short. It is necessary to trickle nutrient into slabs for just long enough to get a 10–15% run off. Your timer should be adjusted to provide this amount of nutrient at least four times during the daylight period. More frequent irrigation may be beneficial. Regular checking of nutrient EC/CF values from within the slab itself with a syringe is the most important routine for the rockwool grower. If the conductivity begins to rise then the grower will need to increase irrigation to ensure run off at each watering cycle. If conductivity remains high then it is a simple matter of flushing the slabs with water.

## Oxygen in a nutrient solution

**Roots require oxygen to grow and low levels are the main cause of almost all root diseases. Both soil and hydroponic plants often fall prey to the same syndrome of root rot and over-watering although it is rarely recognised as what it really is.**

The real cause is a shortage of oxygen at the root zone. In a soil system the soil consists of particles, a film of water on the particles and air spaces between the particles. When too much water is put into the soil the air spaces fill with liquid. The roots will quickly use up what oxygen is dissolved in the water, but if they haven't used enough of the liquid to allow air back in to the soil spaces they will stop working. In this situation roots will start dying within 24 hours.

As the roots die the plants ability to consume water and nutrients will decrease, this will cause symptoms of nutrient deficiencies (mostly pale, slow, weak growth), and they will start to wilt as if they don't have enough water. It is easy to make a fatal mistake at this point and add more water.

In a hydroponic system the cause is often the simple lack of oxygen in the solution; this may be from inadequate circulation and/or aeration. High reservoir temperatures also interfere with the oxygen's ability to dissolve in water. Temperatures above 25°C (77°F) will eventually cause problems, 20°C–24°C (68°F–75°F) is recommended. The same symptoms will appear as with soil plants but you can also check the roots. Healthy roots should be mostly white with maybe a slight yellowish tan tinge. If they are a brownish colour with dead tips or they easily pull away there is the beginning of a serious problem. An organic, 'dirt like' rotting smell means there is already a very good chance it is too late. As roots die and rot they take oxygen from the water, as oxygen levels are further depleted more roots die, a vicious circle may be well underway. Reduced oxygen levels and high temperatures both encourage anaerobic bacteria and fungi. The plants may still be saved but you will have to work fast.



A raised oxygen level promotes strong white healthy root growth with lots of fuzzy new growth visible. This piliterous layer (fuzzy growth) has massive surface area allowing for rapid absorption of the huge amounts of water and nutrients needed for rapid growth. A healthy plant starts with a healthy root system.

In plants, extra oxygen will massively stimulate protein production at the cellular level. This will greatly enhance the photosynthetic process, leading to bushier plants with larger leaves, thicker stems and shorter internodes. Plants will be stronger and leaves will be darker, thus collecting light with greater efficiency and further improving photosynthetic response.

To raise the oxygen level of your hydroponic system add diluted Essentials OxyPlus and use an air pump in combination with an air stone. If using a recirculating system make sure the incoming solution is dropped into the reservoir from a height thus aerating the tank solution.



**Never use OxyPlus with organic feeds or beneficial bacteria.**

## Maximising nutrient uptake

### Maximise nutrient uptake with foliar feeding

The most commonly used method of hydroponic plant fertilisation is through a nutrient solution applied to the root zone of the crop. While plant root systems are in the most part efficient at absorbing mineral nutrients, certain conditions can prevent optimal uptake rates of some of the elements plants require. When plants are showing signs of stress, have suffered root death or damage, are showing a nutrient deficiency or are being established from cuttings, then foliar feeding becomes a particularly useful method of nutrient application. Foliar feeding provides nutrients through the foliage of the plant which has the ability to absorb and translocate certain minerals within plant tissues – this is a technique which growers can use in many situations. Studies have shown that correctly applied foliar nutrition such as VitaLink Foliar can be up to TEN times as useful to the plants as fertilisers supplied to the roots.

#### The Process of Foliar Feeding

Most leaves have stomata either only on the underside or on both sides of the leaf which enable gases to be exchanged for photosynthesis and respiration as well as

releasing water vapour in stomatal transpiration.

The most effective use of foliar feeding is as a rapid and effective method of supplying micro nutrients such as calcium which is hugely beneficial. As the calcium molecule is large, it can not easily be taken in by the relatively small pores on the piliferous layer of plant roots. However the comparatively large stomata on the leaf can easily absorb the large calcium molecule. We recommend VitaLink Foliar for this as it is a calcium rich feed designed to give your plant a boost.

Due to the makeup of coco coir, foliar feeding can provide substantial benefits as calcium can be less available to your plants when relying solely on root feeding.

#### Foliar Nutrient Application

The foliar nutrient solution should be applied as a fine mist until 'run off' so that the entire leaf surface is wetted. The time of day when the solution is applied is also important. It is best to spray just before the lights come on and temperatures are cool; or when the lights go off and conditions are warm. These conditions allow the leaf to dry rather than stay wet for an extended length of time. Foliar solutions should not be applied during hot, bright conditions or if the plants are wilting or under water/osmotic stress as the plants' stomata are likely to be closed making application ineffective.

The use of Essentials Non Ionic Wetting Agent is vital for foliar feeding. Essentials Non Ionic Wetting Agent is necessary to assist



in the absorption of droplets on difficult to wet leaves as well as assisting with the absorption of the nutrient solution into the plant tissue. Do not use domestic soaps or detergents as these contain perfumes and other plant unfriendly ingredients.

Foliar feeding can be carried out on a regular weekly basis, or can be limited to the times when the crop comes under high nutrient demand such as early flowering set and heavy fruit loading. Often the greatest response to foliar feeding will occur during the active growth phases of plants (period of exponential growth). During these active growth stages, leaves show a particularly high efficacy for absorbing nutrients.

If a period during which the plants have difficulty in absorbing nutrients via the root system should coincide with a period when there is a particularly vigorous demand for nutrients, the result will be a significant loss in yield potential, without the grower seeing any visible signs of deficiency. Under such conditions foliar fertilisation can provide particularly impressive results.

Nutrient products we recommend for foliar feeding include VitaLink Foliar.



## Keep a check on your soil hydration to maximise growth

Sandy soils, soils high in organic matter and potting mixes, if left to dry out before watering, can become repellent to water, i.e. hydrophobic. When hydrophobic soils are irrigated, the water simply runs off and is not absorbed. This can be a trap for gardeners who think they have watered their plants when in fact the water has simply run to the sides of the pot and out the drainage holes without wetting the soil at all. If water cannot readily penetrate and wet the soil, the availability of moisture to plants is reduced, decreasing the germination rate of seeds, the emergence of seedlings, and the survival and productivity of crop plants. Lack of sufficient water in the soil also reduces the availability of essential nutrients to plants, further limiting growth and productivity.

Essentials Non Ionic Wetting Agent will help to overcome the effects of waxy organic coatings on the surface of the soil and the surface of organic matter thereby allowing the water to penetrate and be absorbed. It reduces the surface tension of water allowing the water molecules to spread out and to wet the waxy surface of the soil particles allowing water to move into the soil through the spaces. The best way to apply Essentials Non Ionic Wetting Agent to your soil is by making small holes in the soil surface to allow water to pass through the hydrophobic surface layer.

What Essentials Non Ionic Wetting Agent does not do is to change the structure of the soil. It does not improve the soil condition as such. Slow rates of water infiltration can also be the result of factors such as soil compaction and heavy clays. Essentials Non Ionic Wetting

Agent will not solve these problems and other strategies need to be employed. These include adding Perlite and/or Hydroton Clay pebbles to create spaces through which water and air can move.

## Using silicon in hydroponics

**Silicon is one of the essential plant building blocks and is naturally present in soil but not in hydroponics.**

When plants take up silicon in soil, the silicon is deposited in cell walls, giving structural rigidity and strength. This allows plants to better resist insect damage or disease that involves tissue penetration. Since most fungal diseases require initial penetration of the tissue, strengthening this protective layer provides better resistance to various diseases.

Silicon also assists the even uptake of nutrients and helps prevent toxic build-up of nutrients in plant tissue and reduces water loss through transpiration.

This awareness of the benefits that silicon plays in plant health and nutrition, means we should no longer ignore its value and wherever possible, include its use in all hydroponics feeding schedules.

Silicon is classed as an immobile element so once the plant has incorporated this element into the cell wall the plant cannot move it anywhere else. For this reason, if you are using a hydroponic system you should add Essentials Silicon+ every time you add nutrient to your tank.

**Please note: Fill your tank with water, dilute silicon and add to your tank, mix well, and then add the nutrient. If you add the nutrient first your solution will turn white.**

### Benefits:

- Raising the silicon concentration in hydroponic solutions produces thicker, whiter, healthier root systems.
- Adds very useful extra potassium for enhanced flowering/fruitletting.
- Increases chlorophyll production producing darker green leaves and improved photosynthesis, leading to the ability to tolerate both lower and higher light levels.
- Acts as a facilitator for uniform and efficient uptake of nutrients and helps prevent toxic build-up of nutrients in plant tissue.

These benefits produce a healthier, more productive plant, leading to increased production, weight and harvest per plant.

For optimum results, use Essentials Silicon+ alongside your chosen nutrient from early growth through to harvest.



## Essentials – the products

### Advanced products through research

The Essentials range has been helping growers produce bumper yields since 1997. With our ongoing product development, we constantly look for ways to improve existing products as well as creating innovative new ones.

### Reliable Performance

We maintain stringent quality control to ensure products perform – every batch of liquid product undergoes complete lab analyses before shipment and all electronic devices are batch tested and QA marked.



## The Essentials professional range

- **pH adjusters** in high and low strengths to adjust the pH of your nutrient solution to suit your needs.
- **pH, EC and Combi meters** to allow accurate measuring of nutrient strengths and pH levels.
- **Buffer 7, Buffer 4** and **Calibration Fluid** to keep your pH and EC Meters in accurate condition.
- **Oxyplus**, used to add oxygen to the nutrient solution. Also assists in the control of certain root diseases and can be used to clean and sterilise all hydroponic systems and certain media between crop planting.
- **Wetting Agent**, used to reduce the surface tension of water in foliar feeding and soil media.
- **Silicon** to aid in developing stronger plants and healthier root systems.
- **RoomClean**, a natural and safe disinfectant.
- **BlockClean**, used to keep biomass from the surface of your growing media.

All the Essentials range can be used with any brand of nutrient.

**Please note** however that OxyPlus ( $H_2O_2$ ) should never be used with organic or beneficial bacterial products.

	NATURAL CLEANERS		OXYGEN	TESTING AND MONITORING							pH ADJUSTMENT				WETTERS	SILICA
	ROOM/CLEAN	BLOCK/CLEAN	OXYPLUS (H2O2)	EC/CF METER	pH METER	TRIDENT METER	pH TEST	BUFFER 4	BUFFER 7	CF STANDARD	pH UP	pH DOWN	pH UP EASY CONTROL	pH DOWN EASY CONTROL	WETTING AGENT	SILICON+
<b>STARTING OUT &amp; MAINTAINING YOUR GROWING SYSTEM</b>																
SETTING THE pH LEVEL																
OXYGENATING SOLUTION																
MONITORING pH																
MONITORING EC/CF																
MONITORING TEMPERATURE																
<b>KEEPING YOUR GROWROOM CLEAN</b>																
STERILIZING AFTER HARVEST																
STERILIZING DURING CROP																
SPOT CLEAN SPILLAGES																
KEEP MEDIA FREE FROM BIOMASS																
CLEANING OUT DRIPPERS AND LINES																
<b>DISEASE SUPPRESSION</b>																
PREVENTING FUSARIUM																
PREVENTING PYTHIUM																
PREVENTING BOTRYTIS																
PREVENTING ROOT DEATH																
<b>INCREASING GROWTH RATES</b>																
INCREASING ROOT GROWTH																
INCREASING FOLIAR GROWTH																
<b>INCREASING NUTRIENT UPTAKE</b>																
THROUGH THE ROOTS																
THROUGH THE LEAVES																

## Essentials pH UP and DOWN

Essentials pH adjusters work simply by altering the pH of a solution. If the current pH is at 5 (slightly acidic) a solution of alkaline (pH UP) is added to raise the solution to the desired level.

This also works in reverse. Essentials pH UP and DOWN are supplied in 2 strengths.

### Essentials Easy Control 25

Easier to use for novice growers as there is less chance of over dosing.

pH UP potassium hydroxide – 25% strength

DOWN phosphoric acid – 25%

pH strength

### Sizes available:

pH UP Easy Control – 250ml, 1L

pH DOWN Easy Control – 250ml, 1L



### Essentials pH UP and pH DOWN

Standard pH adjusters, highly concentrated and favoured by professional growers using large reservoirs.

pH UP potassium hydroxide – 50% strength

pH DOWN phosphoric acid – 81% strength



## Essentials pH Buffer 4 and 7

Essentials pH buffers are a known solution of a certain pH value designed to test the accuracy of pH meters used to measure the pH of a nutrient solution.

It is important to realise that unless you calibrate your pH meters with Essentials Buffer 4 and 7 at regular intervals the accuracy of the pH readings will be doubtful. Serious loss of crop performance may result, which if allowed to continue can also result in damage to the plants.

Essentials buffers use two values of 4 and 7pH to calibrate your pH testers as they are at the outer reaches of the range of pH where you work in hydroponics i.e. 5.5–6.5. It is not necessary to calibrate pH testers to any other value for hydroponic use as we only work in a small area of the pH scale.

When calibrating, it is a good idea to only use a small sample of buffer solution in a separate container, test the meter and then discard the solution. Discarding the used solution will prevent any contamination of the fresh solution and maintain longer life of the calibrating solution.



## Essentials Digital pH & EC meter

Convenient and easy-to-use meters specially designed for testing the pH & CF/EC level of nutrient solutions. Just dip the sensor into test solution, stir and wait, then read a stable reading in about 20 seconds.

The Essentials pH & CF/EC meters, are truly the most rugged glass type pH & CF/EC testers around. They are drop-shock resistant, temperature compensating and easy to calibrate. The units are also water resistant, allowing easy washing. Even if the meter is accidentally dropped into the water, it will remain afloat so as to enable immediate retrieval without damaging the electronics.

The meters cost less per sample than competing high quality testers. Meters have about 1–3 year lifespan depending on rate of sampling. (Units are good for a minimum of 365 accurate pH tests).

The meters have an energy saving feature that shuts off the tester when it is not in use. To ensure accurate reading at all times, the unit displays a low battery symbol to alert the user to change batteries before it degrades the accuracy of important readings.



## Essentials Trident

The Essentials Trident Meter is an all-in-one conductivity, pH and temperature meter. It comes with a replaceable probe housing containing all 3 probes. The meter is dipped into the solution and the readings are displayed on two screens.

Calibration of the pH and EC/CF/ppm is very easy using the push buttons on the meter and Essentials calibration solutions. The Essentials Trident Meter offers the added benefit of being able to select the display options for temperature as °C or °F and nutrient solution as CF, EC or ppm.

### MAIN FEATURES:

- Light and portable
- Measures pH, nutrient strength and temperature
- Easy-to-use
- Displays temperature in °C or °F
- Three display options for nutrient: EC – CF – ppm
- Easy push button calibrations
- Auto turn-off function
- Long life AA batteries
- Low battery indicator
- Temperature Compensated



## Essentials pH test Kit

**A cost effective, easy-to-use pH test kit ideal for the novice/hobby grower.**

These test kits work by adding a small amount of the nutrient solution to a vial (supplied in the kit), adding drops of test solution and mixing. Then comparing the colour of the resulting liquid in the vial with a colour chart (supplied). This is a wide spectrum pH test indicator that measures between pH 4.0 and 8.5, and will last for over 200+ tests, making it very economical.

**Sizes available:** 30ml

## Essentials CF Standard (CF 28)

**Essentials CF Standard is used to calibrate CF/EC meters.**

It is important to realise that unless you calibrate your CF/EC meters with Essentials CF Standard at regular intervals the accuracy of your CF/EC readings will be doubtful.

Temperature will affect CF, always ensure the meter you use is temperature compensated – like the Essentials EC meter and Trident meter.



## Essentials Non Ionic Wetting Agent

**Essentials Non Ionic Wetting Agent works by reducing the surface tension of water allowing the water molecules to spread out and to wet the waxy surface of leaves and soil particles allowing water to penetrate the soil or enter leaves through pores.**

### For Foliar Feeding:

Essentials Non Ionic Wetting Agent is necessary to ensure the adherence of droplets on difficult to wet leaves as well as assisting with the absorption of the nutrient solution into the plant tissue. Simply mix with your foliar feed and apply.

### For Soil Rehydration:

The best way to apply Essentials Non Ionic Wetting Agent to your soil is by making small holes in the soil surface to allow your water/wetting agent solution to pass through the hydrophobic surface layer.

**Sizes available:**  
250ml, 1 litre, 5 litre



## Essentials Silicon+

Essentials Silicon+ enables the grower to add this beneficial mineral to any nutrient solution. Silicon+ produces a stronger plant by enhancing cell structure and also aids the development of root systems. The high pH of Silicon+ enables the product to be used as a pH Up in hydroponic systems.

### Benefits of Essentials Silicon+

- Better resistance to various diseases.
- Even uptake of nutrients and helps prevent toxic build-up of nutrients in plant tissue.
- Reduces water loss through transpiration.
- Produces thicker, whiter, healthier root systems.
- Increases chlorophyll production producing darker green leaves
- Improved photosynthesis, leading to the ability to tolerate both lower and higher light levels.
- Adds very useful extra potassium for enhanced flowering/fruitletting.

For optimum results, use Essentials Silicon+ alongside your chosen nutrient from early growth through to harvest.

### Application:

Fill your tank with water, add the silicon, mix well, and then add the nutrient.

### Sizes available:

1 litre, 5 litre



## Essentials OxyPlus (H<sub>2</sub>O<sub>2</sub>)

Essentials OxyPlus is a liquid additive that can be used in a hydroponic system to increase oxygen content and maintain system cleanliness or to sterilise soil. It can also be used as a preventative against pythium. Essentials OxyPlus is a must have product for all serious growers.

### Here are some general uses for OxyPlus:

- OxyPlus drives out chlorine and degrades pesticides/herbicides and organic matter that might be present in your water supply.
- Achieve rapid root growth in cuttings when treating your growing media.
- Add to your hydroponic systems to raise oxygen levels.
- OxyPlus kills harmful bacteria and pathogens very effectively. Ideal for post harvest clean ups. It will also promote rapid decomposition of organic material within the medium, tanks, pipes, drippers etc.



Keep OxyPlus in a fridge or cool environment.

**USE WITH CAUTION & HANDLE WITH CARE.**



### Sizes available:

250ml, 1L, 5L

## Essentials RoomClean

**Essentials Organix RoomClean is a powerful 100% natural cleaner and disinfectant for growrooms and greenhouses. When used regularly, RoomClean will keep your growroom and growing equipment clean and free from fungi and bacteria. RoomClean can be used on all hard surfaces, such as metal, plastic, glass, wood, vinyl and painted surfaces.**

RoomClean is supplied in a 1L concentrate at a 25:1 concentration (it goes further than its competitors and is natural!). Ideal for mixing in a bucket for disinfecting growrooms at the end of a crop.



RoomClean is also supplied in a ready-to-use spray bottle (RTU) form. Ideal to have at hand anytime to mop up spillages or remove unwanted algae growth on growroom surfaces.

There is no need to remove plants from your growroom before using this product.

- **KILLS HARMFUL BACTERIA**
- **NO NEED TO REMOVE PLANTS**
- **SAFE TO CHILDREN AND PETS**
- **100% NATURAL PRODUCT**

### Sizes available:

RoomClean RTU (ready-to-use)

– 750ml trigger spray

RoomClean concentrate – 1L



## Essentials BlockClean

**Throughout the growing cycle BlockClean will keep your media clean and free from biomass, which over time can become a breeding ground for disease pathogens.**

BlockClean can be used on any growing media which attracts biomass sludge. There is no need to remove plants from the media before using this product.

Designed to be used in conjunction with beneficial bacteria such as VitaLink BioPac or Beneficials Bio-Link Plus, the resulting dead biomass will feed the beneficial bacteria which will in turn convert this matter into food for your plants. Now that's what we call recycling! This is a 100% natural product.

There is no need to remove plants from the growroom before using this product but we do not recommend using Essentials BlockClean on young plants.

- **KILLS HARMFUL BACTERIA**
- **NO NEED TO REMOVE PLANTS**
- **SAFE TO CHILDREN AND PETS**
- **100% NATURAL PRODUCT**

### Sizes available:

BlockClean RTU (ready-to-use) – 750ml trigger spray





For hydroponic...



...coir...



...soil growing...



...and something to give your plants a boost.

Tailored to suit every growing method and ability, Vitalink Plant Nutrition will help you to get the best from your plants.

[www.vitalink.eu](http://www.vitalink.eu)

## ESSENTIALS

See our web site for great tips and more detailed information on all of the products in the Essentials range

[www.growcontrol.co.uk](http://www.growcontrol.co.uk)

