

# CANNA

Issue No.2 - Fall 2007

# *Talk*

# Boosters

What's mystic and  
what's true?

## Growers Tip

Foliar Applications

## Research

Kingdom of the Fluffies

## What's New?

Get updated with  
the latest news

# HQ's Talk:

We at CANNA are proud to present this 2<sup>nd</sup> edition of **CANNA Talk**. What started out with just a double folded "thing" initially, has become a 10 page issue this time. Of course, we will keep aiming for further growth in the future, so it will truly become a magazine eventually: a magazine which will be available FOR FREE at hydroponic shops throughout North America. It will provide you with loads of interesting and entertaining info on all kinds of industry-related stuff.

When the idea for publishing a magazine started here at the CANNA HQ, everyone was excited. The idea itself was born easily. Soon it turned out this was going to be quite a pickle. Our customers are most important to us and our goal is to do something in return for them; being CANNA, we wanted continuity in it. What's the point in paying back only once, especially since our customers are extremely loyal towards CANNA. We also didn't want to find it biting us in the ass after a while. So, lots of brainstorming, discussions, arguing (leading to even more obstacles), frustration even insomnia at times followed in the weeks before now. Finally all this started paying off as we came to a mutual understanding that this magazine had to be infotaining; a mixture of both information and entertainment.

Now, as to the information part, we found ourselves in the luxurious position of having our own research department and laboratory known as CANNA Research, who provides us with scientific information. They have shared their knowledge with many well-known magazines already. From now on, you may expect to find the latest actual fact-based information in CANNA Talk.

We love to share all this information with the world, but we don't want to make you feel you are reading a dictionary . We want you to enjoy reading and experiencing it. So we hope you find good sport in reading experiences and tips from other growers alike.  
If so, or if not, either way, please let us know. You'll find our e-mail address on the website. Now go check it out yourself!

Cheers,  
Jeroen, CANNA HQ's



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## FOLIAR APPLICATIONS



# GROWERS-TALK

A word from a grower

## My first 100% organic experience

It's hard to find the words to describe my excitement when I found out that BIOCANNA landed in North America. For me as a bio enthusiast this was a dream coming true.

## The first time

My first growing experience with BIOCANNA I will never forget. The first weeks I wasn't flabbergasted by the quality of the product, my leaves even turned a bit yellow. As an organic guy you take the sacrifice of growing 100% organically but I felt I had to do something or at least could not resist the temptation to do so. I increased the dilution ratio of the Bio Vega a little bit but still between the ratio range CANNA is suggesting on their feed chart.



## 2007 started with a Bio Bang

Beginning of this year I finally got the opportunity to grow with the only true organic product available on the market. I didn't understand why it took so long to get the product to our continent but now I know. CANNA wanted to wait until they finished the development of their BIO TERRA PLUS, an amazing organic earth mix with no equal on the market.

## A growing concept

CANNA advises to use the BIO TERRA PLUS with their BIOCANNA nutrients and I can tell you: that's no slick marketing trick. Our North American mixes are not or hardly pre fertilized, the BIO TERRA PLUS is. Their mix is designed to click with their nutes which creates a *growing concept* instead of some loose "organic" products, all doing their own job.

## Never ever changing again

From there on the smile on my face never disappeared. Even the weight of the end result was comparable to what my "mineral friends" achieve. As an organic grower I grow with my heart so I am not driven by yield but it was a nice bonus. So eventually I ended up with an amazing yield with excellent organic taste, thanks to the BioBOOST. That day I promised myself to never use or even try a different product again.

Best Regards,

Jonathan  
gardenington@hotmail.com



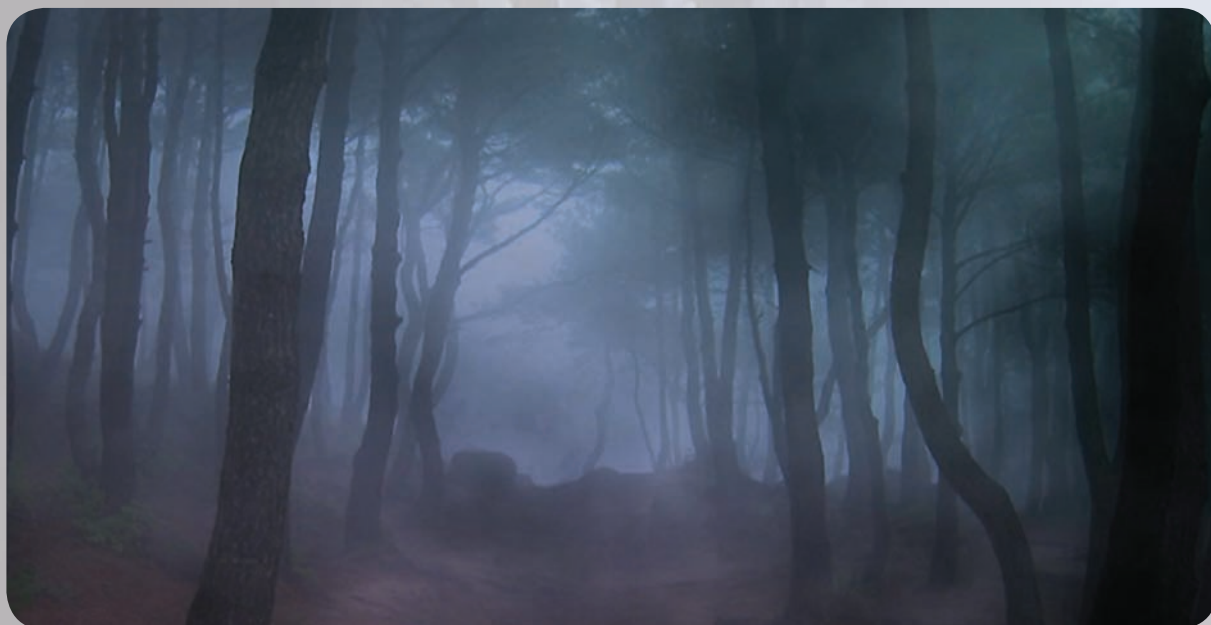


In the spotlight:

# BOOSTERS:

what's mystic and what's true? By Ralph B.

I never met a Booster I didn't like...Let's face it, this is the mantra of North American growers. There are so many self identified 'boosters' out there it takes a super computer to count them. Problem is few are truly metabolism boosters, which is what a booster should be, most are either additional nutrients, organic compounds, or someone dipping their old socks in a vat of water. One company actually has three products that are the exact same products, only the names were changed to protect the innocent.



A booster acts independent of nutrients, enabling the plant's systems to work at optimal levels while leaving no footprint or excess baggage behind. It works by influencing plant systems, sometimes by triggering desired responses such as an autoimmune response, or by increasing in specific essential oil production. There are many ways to get there, by overloading a particular component and hoping a runaway reaction occurs, by morphing a system to produce more of one thing or another, by directly interjecting a component through translaminar or transcellular migration, or by genetically altering the plant.

None of these methods are particularly effective, consistent or benign (some even dangerous). The problem is we only affect one part of a system

while ignoring the rest. The best way to achieve these goals is to affect all the systems with the one component common to all systems, Energy.

By affecting the energy pathways, all of them from production, to translocation, storage, and utilization, we can affect all systems equally. Therefore, the best booster would be one that affected all sys-

**“A booster should allow energy to be metabolized easily”**

tems and allowed them to utilize energy at the optimal rate possible. Not just this, but it would be one

that works with the plants existing systems, causes no imbalances, produces no mutations, works within the plants own framework, and leaves nothing behind that is toxic or allergenic. A booster should allow energy to be metabolized easily, moved quickly, and utilized as needed never limited. By allowing these things to happen, the plant has all the energy it could ever need for flower production and maturation; production of desired compounds like oils and alkaloids; rapid and extended photosynthesis; effective available storage of energy components like starch; stronger, faster dividing cells; and better respiration processes in the plant cell. The only thing that would improve upon this magic elixir would be if it were composed in such a way as to significantly affect particular areas as well so that overproduction of desired components would not alter or tax all other systems because our

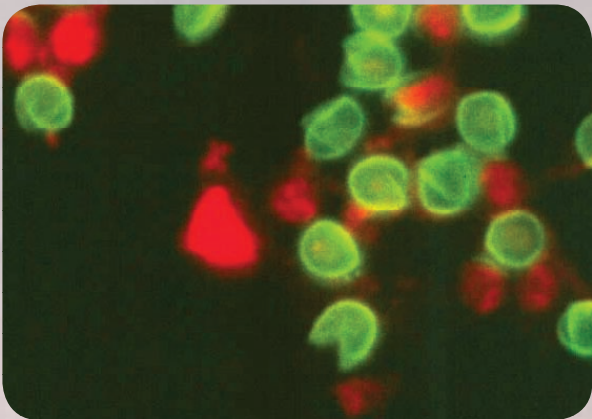
duction by mimicking specific stressors, or change the ratios of internal compounds to more of what the market is after and less of what is ineffective. We might even be able to affect the way structural and chemical compounds are laid down so that cells become larger or oils and saps becoming denser. Well, truth is, there are two boosters now that do exactly this.

CANNA Research has developed two new products to the market, BioBOOST and CANNABOOST Accelerator. The two are identical in almost every way but BioBOOST is organic with nothing inorganic added and CANNABOOST has a component part that is inorganic but pure. The use of this component in the Boost product kicks it in high gear so that the results are rapid and big. BioBOOST handles itself in a slower manner, but it is the perfect

**“One company actually has three products that are the exact same products, only the names were changed”**

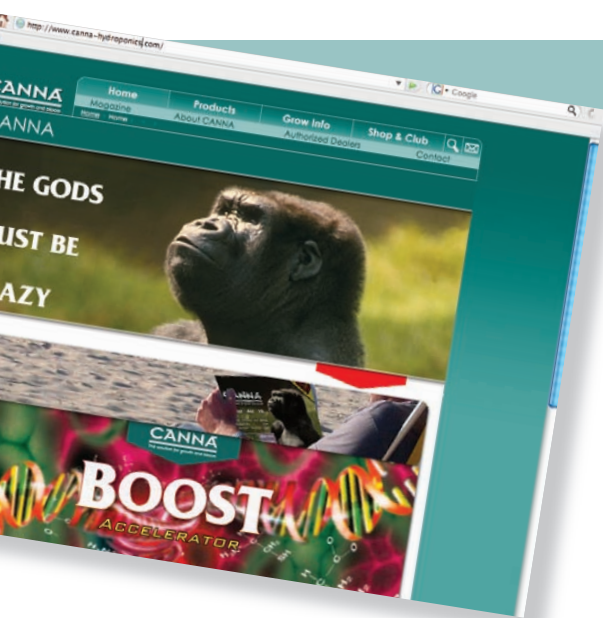
energy is now free flowing and available whenever and wherever the plant needs it. By using the right plant components, and combining them with the correct decomposition process it might even be possible to take advantage of other desired results like triggering the plants natural immune systems (people get vaccinated). We might even be able to trigger heavier flower and oil pro-

duction for those wanting to stay 100% organic and when using the Bio Vega, Bio Flores nutrients. BioBOOST will work in all systems like CANNABOOST. Both products affect the energy systems of the plant in the way described, and the organic component gives the part that would be nice. A significant part of both products is the oligosaccharines that result from the breakdown of the bio components. These are basically small protein chains and cell wall chains that mimic enzymes, hormones and growth regulators. They stimulate key things in a plant such as the immune system (which turns on and acts as a preventer), alkaloid and essential oil production, influences protein synthesis allowing the cells to become denser, and strongly trigger the 'organic' taste in consumed plant components. Instead of trying to find many products to do the same thing (can't be done), a grower can invest in CANNABOOST and BioBOOST and get them all in one package.



Healthy Immune System

# What's New?



## NEW WEBSITE!

Besides introducing a new booster product this fall, CANNA decided to give their website a boost as well. The looks as well as content have been changed. It's well organized and has a refreshing appearance. In addition to the two new, quite revolutionary instruments to help you with growing questions you might face, you can also find general info on the company and its' products, some useful downloads and a list of dealers.

A screenshot of the 'Terra' Grow Guide table on the CANNA website. The table provides a detailed growing schedule for different stages of plant growth, including vegetative and blooming phases, with columns for weeks, light, and various nutrient concentrations. A red arrow points to the table. Below the table are 'Back' and 'print' buttons, and a note about recommended pH.

	Weeks	Light per day (hours)	Terra Vega ml/l liters	Terra Flores ml/l liters	Rhizotonic ml/l liters	Cannazym ml/l liters	PK 13-14 ml/l liters	CANNABOOST ml/l liters	EC
<b>Growing Phase</b>									
Start root formation	1	18	2	0	4	0	0	0	1
Vegetative stage Fast growth	1-3	12	4	0	2	2.5	0	0	1.4
<b>Blooming Phase</b>									
Generative stage Growth stagnates First signs of fruit formation Pistils appear	1-2	12	0	5	0.5	2.5	0	2-4	1.8
Generative stage Small fruits develop	1	12	0	5	0.5	2.5	1.5	2-4	1.9
Generative fruit Increases in size	2-3	12	0	5	0.5	2.5	0	2-4	1.8
Final 7-14 days Fruit increases in size and ripens	1-2	12	0	0	0	2.5	0	2-4	0.6

Recommended pH: 5.2 - 6.2

Back print

## GROWGUIDE

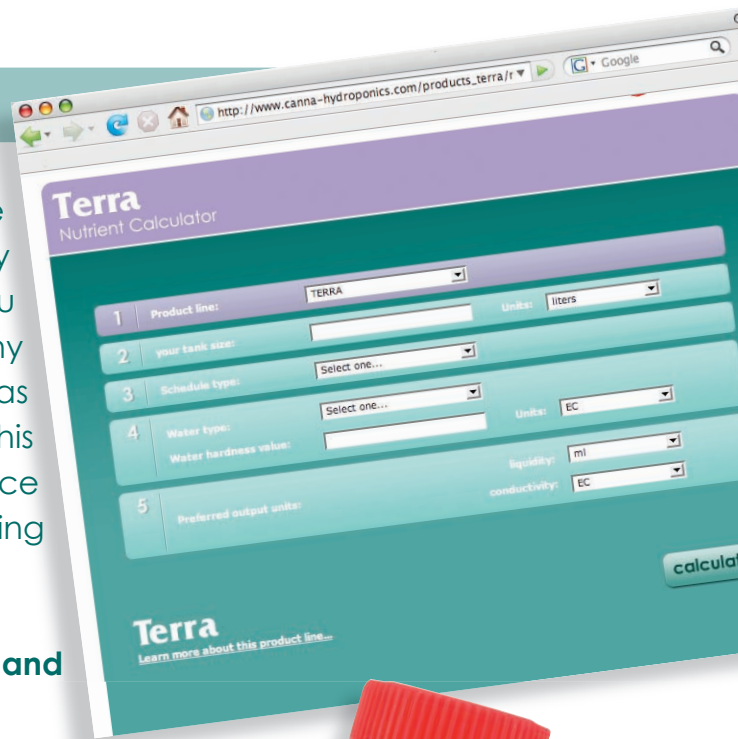
The site now contains a Grow guide as well as a Product calculator. Within the Grow guide you can select the sort of product line you wish to use, connecting with the sort of substrate to grow on. It is also customizable to your growing situation. If you fill in all the settings it automatically provides you with a growing schedule for the whole cycle of your crop.



## PRODUCT CALCULATOR

The Product calculator works in the same way as the Grow guide. Fill in the way you would like to grow your crop and you will find, for example, exactly how many bags of soil or coco you need, as well as the amount of nutrients or additives. This prevents you from going to the store twice because you just found out you're running short on one thing or the other.

**So go check it out on the new website and test it yourself!**



## CANNABOOST: FULLER FRUITS, BETTER TASTE

This fall CANNA launches CANNABOOST. CANNA's powerful flowering stimulator. It improves quality and increases yields. CANNABOOST stimulates the development of newly formed flowers which ultimately results in fuller fruits. This leads to a more homogeneous harvest because the fruits mature evenly. Something very special about CANNABOOST: it not only assures excellent yields but also better taste, a little something extra for the CANNA grower. For more info on CANNABOOST visit

**[www.canna-hydroponics.com](http://www.canna-hydroponics.com)**





CANNA Research:

# KINGDOM OF THE FLUFFIES

Concerning fungi in crops

D. Kroeze MSc, CANNAResearch

**A** meteorite fell to earth in Mexico around 65 million years ago. It plunged the earth into pitch black for about four years. There was no light for plants and they died off in great numbers. This meant that there was no more food for the animals and they also died off on a large scale. It is widely believed that this was responsible for the decline of the dinosaurs. It was only fungi, which do not require light to grow, that did well and grew in abundance on the remains of the dead plants and animals.





## Kingdom of the Fluffies - D. Kroeze MSc, CANNAResearch

**Grey mold (*botrytis*), mildew or *pythium*: everyone has at least heard of these at some time. They aren't just diseases that can attack plants, they are also all fungi. What are fungi exactly? And do all fungi make plants sick?**

### What is a fungus?

We can try to classify the organisms that live on our planet in groups. How many groups needed to do this has still to be agreed upon by scientists. In practice, it seems that living organisms simply don't fit into slots perfectly since there are always exceptions to established criteria and new insights into the criteria itself. The classification is currently being reviewed again. There are, however, three groups that have been established for a long time. These groups, or better said, kingdoms, are animals, plants and fungi. Other organisms such as bacteria still have no definitive categorization.

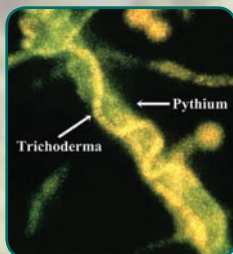
The fact that fungi are a separate group means that they also have specific characteristics. Plants and fungi were previously categorized in the same group. The big difference between plants and fungi is that fungi have no chlorophyll. A further difference is the cell wall of fungi, which, in contrast to that of plants, is made from chitin. Nutrients are absorbed through the cell wall once they have been broken down by the enzymes that they secrete.

Fungi can provide for their nutritional needs in different ways. There are fungi that have cohabitation (symbiotic) contacts with other organisms. There are many that live together with trees, for instance. Their reproductive organs are well known; they are the mushrooms in the woods. The fungi get sugars from the trees in exchange for certain nutrients. Another important group is what is known as the saprophytes. These are our planet's waste disposal system. They live on dead material, such as leaves, that have fallen.

Then there are the parasites that live at the expense of other organisms. These fungi are by far the most responsible for the majority of diseases encountered in agricultural crops.



A fungus on the hunt. It catches the nematode with its lasso and then eats it slowly.



The parasitic *Pythium* fungi caught by the *Trichoderma* fungi. Photos: American Phytopathological Society

Finally there is the group of predators, which is the least well-known group of fungi. Predators hunt other organisms. There is a type of fungi that hunts nematodes and strikes by using traps. After the trap is sprung, the fungus grows into the nematode and digests it. Another, somewhat better known example is the *Trichoderma* fungi family. These fungi attack what are known as damping-off diseases which are parasitic fungi that target germinated seeds or very young plants in particular. *Trichoderma* occurs naturally in coconut fiber among other things. Coconut fiber is generally steamed which kills the fungi; however, coconut fiber that hasn't been steamed is also available.

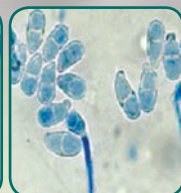
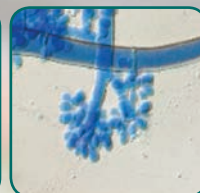
### Parasitic fungi in plants above ground level

A dreaded fungal disease in horticulture is caused by the grey fungi (*Botrytis* sp.). The grey fungus is parasitic but can also live as a saprophyte. It certainly isn't choosy and has a lot of agricultural crops on its menu. A well-known example of this is the



Grey fungi on strawberries.

strawberry where it can often be seen as a grey fluff. A pink rot (*Trichothecium roseum*) infection can sometimes resemble a grey fungi infection very closely. It is only under a microscope that the differences become clear.



Fungi on an apple: *Botrytis* or *Trichothecium*?

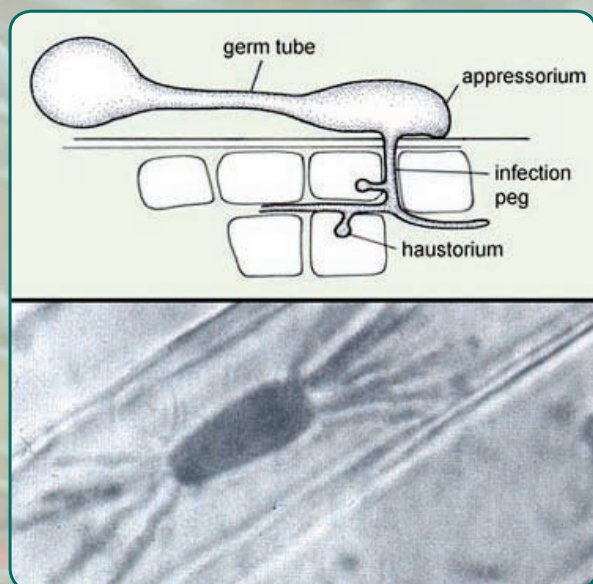
The microscope provides the solution: left *Botrytis cinerea* and right *Trichothecium roseum*

Photo left: Ministry of Agriculture and Agri-food, Canada, photo centre: CABI Bioscience and photo right: University of Adelaide

A white powder is sometimes found on plants' leaves. This is mildew which is a different parasitic fungus. If the fungus is on the upper side of the leaf, then it is genuine mildew but if it is on the underside it is what is known as false mildew. This is often confused by many growers. Mildew can be caused by ... ---->



... different fungi and is generally plant specific. Mildew on cucumber is caused by *Sphaerotheca fusca* but by the *Uncinula necator* fungi on grapes. False mildew is caused by *Pseudoperonospora cubensis* and *Plasmopora viticola* respectively. High humidity is generally ideal for fungus growth. In contrast with most other fungi spores of the genuine mildew only germinate well on dry leaves.



Systematic representation of a plant cell being penetrated by a germinated fungi spore.  
Illustration: University of Hertfordshire

## How an infection develops

If the conditions on the leaf are ideal, and this includes the correct humidity and temperature, a spore that lands on the leaf surface can germinate. A filament grows from the spore which enters the plant via a wound or stoma and then swells up. Once the filament is inside it swells up again and these swellings are used to extract nutrients from the plant cells. Following this, more filaments with swellings are formed. In addition, it forms reproductive organs, which distribute new spores into the air without sex, or asexually. This is how the infection cycle begins.

## Attacks below ground level

Parasitic fungi do not just attack parts of plants that are above ground. Fungi also attack from inside the growing medium. These notorious villains are grouped under the 'damping-off' name and have imaginative names such as *Pythium*, *Rhizoctonia*, *Fusarium* and *Phytophthora*. The grey fungi and a number of others also belong to this group. It is these fungi that often have the 'crib deaths' of plants that have just rooted and the demise of newly germinated seeds on their conscience.

## A number of tips in the battle against damping-off diseases

Spores that are on seeds can be killed by soaking the seeds that are to be germinated in a solution of bleach (one part bleach to nine parts water) for two minutes. After this rinse well preferably using water that has been boiled and then cooled. Place seeds that are to be germinated on the surface of the growing medium and then cover them with a thin layer (three or four times the thickness of a seed) of an inorganic medium such as perlite. Do not use soil from outside for indoor cultivation. Do not use garden tools inside that are also used outside. Clean gardening tools and pots well after use and disinfect them with a bleach or alcohol solution. With a protected crop, ensure that there is constant ventilation that isn't linked to the lighting timer. Avoid giving too much water and allow the medium to dry out a little before giving more water. Do not use rainwater

## Short summary

Fungi are classified into their own kingdom as are plants and animals. We actually only know the fungi that we encounter and this is a very small proportion of those that exist. Unfortunately, a lot of the fungi that we know are pathogenic for our plants so it is necessary to protect our plants against them. You should ensure that they get a good start by preventing damping-off diseases. Also, make sure that later there is sufficient ventilation and avoid excessive humidity. Doing this will hamper the distribution of fungi spores.

Keep in the back of your mind the fact that insufficient humidity can also cause problems, encouraging spider mites for example. ●





## Growers Tip #2

# Foliar Applications

A properly maintained and growing plant seldom needs a foliar application of anything. Likewise, not everything will translocate across the epidermis of a leaf. Some things readily leach out of leaves if exposed to constant watering or misting, this is especially true in the propagation stage of production.

The best way, bar none, to move nutrients into a plant is via the roots. There are times when a grower can make use of limited translocation such as when a cutting has no roots, it will decrease the rooting time, or during periods where the roots are functioning less because of damage or stress. The problem is, the process does not work exactly the same. Most of the adsorbed components, unless very specific, will stay where they enter. So the plant part that gets the spray will benefit where the rest will not.

Some things, such as Rhizotonic and the new Boost line from Canna will translocate to their points of action almost in their entirety. So to get the best results, use very soluble solutions, keep the plant healthy, move the major nutrients in via the roots (and everything else you can), and use foliar feeding to back up what the plant gains through the roots.

Avoid spraying fruit or flowers with anything since it changes the composition the plant wants to achieve and greatly increases the chances of pathogen invasion of the leaves and especially the florets and/or flowers.





# CANNA

The solution for growth and bloom

# BOOST

## ACCELERATOR

### FULLER FRUITS, BETTER TASTE

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